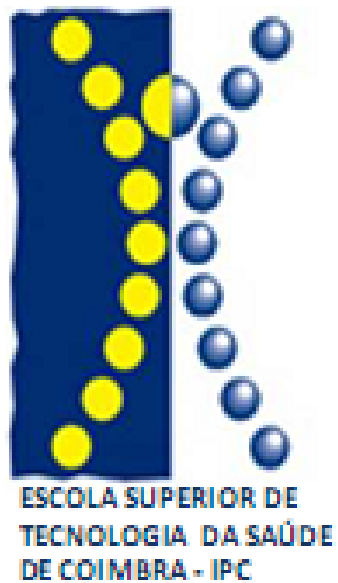


ESTeSC – Coimbra Health School

Abstract Book

Poster Week 8/17

November 24th – 30th, 2017



SCIENTIFIC COMITEE

Ana Catarina Lança

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COMPARISON BETWEEN THE DHP-18 AND THE EVALUATION MECHANISMS USED AND VALIDATED IN BRAZIL RELATED TO THE STATE OF HEALTH OF DIABETICS

Caroline Falzoni; Rui Cruz

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Considering that the growth of diabetes mellitus is more pronounced in developing countries, as is the case in Brazil, it is extremely important that we have instruments capable of identifying factors related to diabetes that can improve the autonomy and quality of life of the users. Therefore, this is an integrative review that aims to analyze and systematize the assessment instruments related to the health status of users with diabetes mellitus used and validated in Brazil, as well as to compare them to the Diabetic Health Profile - DHP-18. The DHP-18 is an instrument that evaluates the health profile of the diabetic and has not yet been adapted and applied to Brazilian reality and culture. After searching several electronic bases, seven instruments were validated in Brazil: Diabetes Mellitus Knowledge (DKN-A); Diabetes Mellitus Attitude (ATT-19); Diabetes Quality of Life Measure (DQOL-Brazil); Diabetes Quality of Life for Youths (DQOLY-Brazil); Diabetes 39 (D-39); Insulin Management Diabetes Self-efficacy (IMDSES); Problem Areas in Diabetes (PAID) and Summary of Diabetes Self-Care Activities Questionnaire (QAD) and Diabetes Distress Scale (DDS). The analysis of these instruments will allow to compare them with DHP-18, to understand their positive and negative points and consequently to obtain the possible advantages and disadvantages of the clinical application and validation of the DHP-18 to Brazilian reality and culture.

Keywords: DHP-18; Evaluation Instruments; Quality of life ; Diabetes Mellitus;

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TEAS FOR TREATMENT OF DIABETES MELLITUS TYPE 2 - METABOLIC MECHANISMS

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The present study has the objective of reviewing the literature on the use of teas for the treatment of type 2 diabetes mellitus and its metabolic mechanisms. Thus, there was a bibliographic survey of articles referring to the use of teas and their biological processes.

Diabetes mellitus is characterized by a metabolic disease due to hyperglycemia, dyslipidemia and obesity resulting from defects in insulin secretion or action or both. Currently, this disease is divided into two types, type 1 diabetes patient and type 2 diabetes, the type 1 diabetes, is called insulin dependent and individuals with type 2 diabetes, are called non-dependent insulin.

Besides a drug therapy, we can also opt for non-pharmacological alternatives such as teas. Among the most common and most effective are black and green tea (*C. sinensis*), chamomile (*Matricaria chamomilla*) and carqueja (*Baccharis trimera*). The bioactive components of plant extracts have become popular and have been considered as complementary or alternative therapeutic agents for managing and / or treating chronic diseases, namely diabetes. Thus, one of the main therapeutic properties of these plants of these teas has in their constitution flavonoids, alkaloids, indoles, phenolic and terpene compounds, which have antioxidant properties and improve metabolism, with potential benefit in the treatment of diabetes.

Keywords: Type 2 diabetes mellitus, tea, metabolic mechanisms, action mechanisms

HYPERPIGMENTATION CAUSED BY HORMONAL CHANGES (HORMONAL CONTRACEPTION AND PREGNANCY)

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Melanin is the pigment which is responsible for skin colour tint and it is produced by melanocytes. Density, number, size and dispersion of the melanocytes are preponderant factors regarding the skin tone.

As a response to diverse stimulus, melanin synthesis increases, resulting in the emergence of irregular brownish spots, essentially in the sun-exposed areas, which are named by hyperpigmented zones. This phenomenon mostly affects women in fertile age. The appearance of these cutaneous manifestations happens due to excessive sun exposition, hormonal contraception, therapy of hormonal reposition, pregnancy, photosensitising medication, cosmetics or stress, and there is still a genetic component associated with its emergence.

During pregnancy, due to the hormonal changes, skin hyperpigmentation is frequently present, especially in the facial and abdominal areas. As for hormonal contraception, it is used by about 60% of women with ages between 16 and 30 years old. It is known that, nowadays and in a long-term use, hormonal contraception can induce the appearance of hyperpigmentations, especially in the facial area.

Keywords: Melanin, skin, hyperpigmentation, hormonal contraception, pregnancy

THE IMPACT OF SECONDARY EFFECTS ORIGINATED BY CHEMOTHERAPY TREATMENTS IN LIFE QUALITY OF THE PATIENTS

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Cancer is defined as an abnormal growth without control of the cells present in the body. There are several treatment modalities, and one of the most used is chemotherapy. In this treatment are used antineoplastic, chemotherapeutic or cytotoxic drugs, that will destroy or inhibit the growth of cancer cells, which multiply rapidly. They act in the cell division and can be used in monotherapy or in combination of drugs, being administered at regular intervals. They may be oral administration, sub-cutaneous, intra-muscular and intra-venous, intra-arterial, intra-theal, intra-peritoneal, intra-vesical, topically and intra rectally. Since their action is markedly systemic and without selectivity, they act indiscriminately in malignant as well as healthy cells. This causes a number of adverse reactions and effects that vary depending on the drug used, dosage, duration of treatment and the drugs used concomitantly. These side effects are highly deleterious and cause several changes in the body that cause changes in the quality of life of the people subject to these therapies. As an example of these changes, we have alterations in physical, cognitive, emotional and social function and more frequent side effects such as fatigue, pain, nausea and vomiting, hair loss, mucosal inflammation, among others, which have a big impact on the day-a-day of the user. Therefore, it is important to address the degree of impact of these side effects on the quality of life of the user in order to try to provide, in this difficult life experience, the best well-being to the user, in order to improve both self-esteem and better therapy.

Keywords: Chemotherapy, Side Effects, Impact, Life Quality

GENERIC DRUGS: CONSUMPTION HABITS AND USER REVIEW

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Nowadays a large percentage of the world population need to use medication and take measures to prevent, control and treat as much as possible acute diseases as well as chronic diseases.

In recent decades, in Portugal, as in other European Union countries, public expenditure on health care has been characterized by a huge increase. In purpose of reducing this expenses, one of the main goals of Drug Policy of Portugal is promoting the Generics' market, since the prescription, dispensation and use of these drugs is reflected in a potential saving for both: patients and state.

According to the Statute of the Medication (Decree-Law number 176/2006, of August 30th - Portugal), Generic is a drug "with the same qualitative and quantitative composition in active substances, the same pharmaceutical form and whose bioequivalence with the reference/brand name drug was demonstrated by appropriate bioavailability studies".

Although Portugal has a rising market for Generic Drugs, there is still a big progression margin for this type of drug, since it is far away from the consolidated world markets. An analysis of the factors that influence the people's adherence to Generic Drugs may contribute to the promotion adhesion and growth of this drugs and, therefore, to control the increase of public expenditure on health care, in addition to improving the cost/benefit ratio for the user.

Keywords: Generic Drugs, Consumption Habits, Pharmaceutical Market, Portugal

INFLUENCE OF CAFFEINE IN THE TREATMENT OF HEADACHE

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Headache is described as discomfort or headache and rarely as an isolated symptom. Subdivide into primary, being a disease in itself, and secondary that translates common symptoms like the flu. The primary one has different types: tension headache, cluster headache, migraine among others.

The potential effects of coffee on health aroused interest in its stimulating effect and its use in conjunction with headache painkillers, mainly paracetamol or acetylsalicylic acid, often sold without a prescription. The main mechanism of action of caffeine is due to its similarity with the adenosine molecule, functioning as an antagonist of the same. Thus its effect is stimulant, antinociceptive and vasoconstrictor, depending on the quality, quantity and frequency of their consumption, lifestyle and genetic predisposition.

Caffeine is helpful in increasing alertness, fighting fatigue, providing well-being, contributing to the treatment of tension-type headache, hypnic and migraine type headache. However, it can worsen cluster headache, primary and suppression of caffeine. The mean age of the patients varies between 40-45 years, predominantly female.

Misuse of drugs for headache is the leading cause of chronicity and drug resistance, causing chronic daily headache. The medicinal products concerned are mainly short or long acting NSAIDs, simple analgesics and associated with caffeine. This abuse occurs as anticipation of headache for fear of pain, leading to caffeine dependence by developing tolerance and abstinence.

Keywords: Headache, caffeine, abuse of analgesics

IMPACT OF THE THERAPEUTIC REGIMEN ON QUALITY OF LIFE IN POLYMEDICATED ELDERLY

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Polymedication is defined as the administration of several different drugs concomitantly and under prolonged treatment. A patient is considered to be polymedicated when taking more than 5 medications per day or when administered medicines that are considered unnecessary for the patient.

The elderly represent the age group where the use of polymedication is most used, since in this phase of the life cycle there is a higher prevalence of diseases, such as neurodegenerative, respiratory, cardiovascular, diabetes, among others. Although the polymedication presents advantages as the increase of the average life expectancy can also cause serious health problems for the elderly with impact on their quality of life.

This study aims to evaluate the use of medications in polymedicated elderly and how their quality of life is conditioned.

An observational study will be carried out, where individuals aged 65 and over will be surveyed and data will be collected through a questionnaire developed for this purpose.

With aging there is an increased difficulty in the metabolization of the drugs resulting in a toxic accumulation and consequently the appearance of more aggressive adverse effects. On the other hand, one of the problems of polymedication is also adherence to therapy and correct use of medications due to the cognitive deficits associated with aging.

For all of this we believe that it is necessary to adopt strategies in order to reduce the polymedication, the prescriber and the pharmacy professionals have a preponderant role in this task and in the promotion of the quality of life of the elderly person.

Keywords: Polymedication, elderly, life quality

USE OF MONOCLONAL ANTIBODIES IN THE FIGHT AGAINST ONCOLOGIC DISEASE

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Introduction: Monoclonal antibodies (mAbs) are immunoglobulins that have been modified to be identify and act in specific targets, since they identify substances that help in the proliferation of cancer cells. Thus, monoclonal antibodies act by blocking the growth of malignant cells without causing damage to normal cells and hence the name of targeted therapies.

AIM: Identify the main mAbs and their mechanisms of action used in oncology.

Material & Methods: For this review, there were used five articles from Medline, PubMed, Google Scholar and B-on. Selected articles were published between 2012 and 2017.

Results: From the mAbs identified so far, 37.4% are immunoconjugated, 62.5% are used in hematological cancers, 75.0% are diluted with saline and should not be mixed with other drugs. The mAbs are known to promote, through different mechanisms of action, apoptosis of cancer cells and have side effects that affect, preferably the digestive system (100%), in second place the hematopoietic (87.5%) and the cardiovascular and central nervous system (50.0%), which could put patients' lives at risk.

Conclusion: MABs are highly effective drugs when specifically indicated, but they can also suffer serious side effects, although the incidence is low. These drugs require very controlled monitoring because of their specificity and toxicity. In this sequence, the safe administration of mAbs requires the participation of professionals such as nurses, doctors and pharmacy professionals who are able to recognize and intervene early in emergency situations.

Keywords: Monoclonal antibodies; oncology diseases; oncology treatment; effects of directed therapies

ADVERSE EFFECTS OF PROTON PUMP INHIBITORS

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Proton pump inhibitors (PPI) are one of the most prescribed medications worldwide, not only because of the high prevalence of gastroesophageal reflux disease patients, but also because it is often prescribed as a “gastroprotective drug” in polymedicated patients. Elder patients, who are frequently polymedicated, are many times prescribed chronic PPI therapy and, as such, they may be more susceptible to possible adverse effects of acid suppression. On the other hand, patients who start chronic PPI therapy early may not present immediate side effects, however they might show serious anomalies in the long run.

The main PPI associated long term side effects are: problems with nutrient absorption, such as vitamin B12; altered bone metabolism, osteoporosis and bone fracture; community acquired and nosocomial pneumonia; Clostridium difficile infection and dementia in the elderly. However, despite the unwanted effects have been reported for chronic acid suppression with PPIs, many of them remain controversial as to their truthfulness and cause-and-effect relationship, so it's important to evaluate their safety in the short term, but mainly in the long term.

Keywords: Proton pump inhibitors (PPI), adverse effects, osteoporosis, dementia.

ADHERENCE TO THERAPY IN CHRONIC PATIENTS

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At the present, a significant percentage of the world population is faced with the need to take medication and to take measures to control and treat chronic conditions. Among the most abundant chronic diseases we find: cardiovascular diseases, diabetes mellitus type II, dyslipidemias, cancer, COPD (chronic obstructive pulmonary disease), dementia and autoimmune diseases.

Adherence to therapy is extremely important when it refers to chronic diseases, as these have a major impact on the population.

Patients with chronic pathology are the least adherent to therapy and according to OMS, more than 80% of deaths in Portugal are due to chronic non-transmissible diseases. It is estimated that, in developed countries, only 50% of chronically ill patients follow the treatment agreed with the health professional, conditioning the economy, well-being and quality of life of the society.

The variables involved in adhesion are many and difficult to measure, and the absence of a valid method of measuring adhesion is the greatest difficulty of research in this area. Non-adherence represents a huge burden on health spending and has a major impact on people's quality of life and the world economy. It is fundamental to know the factors that influence adherence, establishing an association between internal and external variables to illness people, as well as relational variables. In this way, it will be possible to outline strategies that promote adherence to the therapeutic regimen, being educational or behavioral, or both.

Keywords: Adherence, Therapy, Chronic Diseases

ANTINEOPLASTIC AGENTS: OTOTOXICITY IN CHILDREN

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Ototoxicity resulting from exposure to chemical agents affects the vestibular system, being characterized by a functional deficiency and cellular degeneration of tissues in the inner ear. This toxicity may occur in treatments with aminoglycoside antibiotics, beta-blockers, diuretics and some antineoplastic agents.

Drugs derived from platinum, such as cisplatin and carboplatin, are essential in the treatment of pediatric neoplasms, however, induce dose-dependent and ototoxic effects of bioaccumulation. Cisplatin stimulates the formation of reactive oxygen species and reduces the activity of endogenous antioxidants, causing the degeneration of cochlear hair cells, primarily those of high frequency and only after those of low frequency, resulting in hearing loss and impaired balance. Usually, hearing loss is irreversible, bilateral and accompanied by tinnitus. In the long term, children may be affected in speech and learning as well as social-emotional development with a compromise in their quality of life.

The ototoxicity induced by cisplatin therapy occurs with a variable prevalence ranging from 26% to over 90%, depending dose, frequency of administration, age, renal dysfunction and pre-existing hearing loss.

In this way, the identification of otoprotective drugs and the development of less ototoxic therapeutic strategies and that maintain chemotherapeutic efficacy are necessary. A potential otoprotector for the toxicity caused by cisplatin is sodium thiosulfate. The protection conferred is greater when the time interval between its administration and cisplatin is shorter.

Therefore, is essential to characterize the pattern of ototoxicity induced by antineoplastic drugs in children and to identify new therapeutic approaches with the same effectiveness and lower toxicity.

Keywords: Antineoplastic therapy, cisplatin, otoprotection, ototoxicity, children

TO CHARACTERIZE THE HEALTH PROFILE OF DIABETICS AND THEIR RELATION TO ADHERENCE TO THERAPEUTICS

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Diabetes Mellitus (DM) is a metabolic disorder characterized by chronic hyperglycemia resulting from deficiencies of insulin secretion or action, or both.

Currently, DM is classified as: type 1 diabetes, type 2 diabetes, among others. Type 1 diabetes is an absolute deficiency of insulin secretion. In Type 2 diabetes, the cause is a combination of insulin resistance and the abnormal and progressive decrease in insulin secretion.

Some factors that may influence the onset of DM are: ageing of the population, obesity, sedentary lifestyle, inadequate diet and lifestyle change.

Faced with the requirement of this pathology in terms of self-care and self-control, it will not be surprising of the difficulty individuals have to adhere to and maintain the proposed therapeutic schemes. Therefore, in clinical practice, it is important to know and identify the factors related to the patient that may influence the self-management of health and the quality of life of a diabetic person.

Hence the use of the Diabetic Health Profile (DHP), which is a specific measurement instrument for diabetes, which allows assessing the psychological and behavioral impact of living with diabetes.

The knowledge and adherence to the therapeutic regimen is a fundamental aspect for the effective control of diabetes, in which the individual has an active and collaborative role in the planning and implementation of the treatment regimen.

Thus, in most cases, non-adherence to treatment is due to a lack of knowledge about the disease and its control.

Keywords: Diabetes, Diabetic Health Profile, Adherence to Therapy

IMPACT OF THE THERAPEUTIC REGIME ON QUALITY OF LIFE IN POLYMEDICATED ELDERLY

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In the last decades there has been a significant increase in the elderly population and longevity. This gradual aging and physiological changes result in a greater number of pathologies that are directly related to various treatments and to all types of medication. With this in mind, we see a large proportion of polymedicated elderly in our society.

So, the objective of this study is to evaluate the level of polymedication of a population of people over 65 and to analyze its impact on quality of life.

Polymedication is the administration of different drugs concomitantly in which their daily intake is higher than five and sometimes inappropriate drugs are used even if they are adequate to their pathologies.

Since the elderly consume a high amount of drugs (polymedication), it is necessary to promote their self-care and later to approach adherence to the therapeutic regime. Physiological changes and number of medications potentiate the risk of adverse reactions.

Several studies have been carried out that reflect the difficulty of administration and interpretation of the medication in the elderly, which is deduced in the non adherence to the therapeutic regime. Non-compliance poses a number of problems at all levels. At the economic level, there is a high weight in health spending and at the personal / social level there is an increase in hospitalizations, which leads to a decrease in the quality of life of the elderly and subsequently there is an increase in morbidity and mortality.

It is essential to devise intervention plans to increase adherence to the regime, increase its efficiency and, above all, provide the elderly with a better quality of life. To do this, planning should be done to increase adherence, since it is fundamental to know all the factors that influence it and thus to be able to relate them.

Keywords: Elderly; Polymedication, Medication Adherence

COMPARISON BETWEEN USP AND RAD-AR PICTOGRAMS

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Pictograms, are characterized by simple symbols, clear graphics and are able to transmit information, being used as auxiliary in written and verbal language.

Under the United States Pharmacopeial Convention, pharmaceutical pictograms are defined as “standardized graphic images that help to convey indications of medication, precaution and/ or warnings to patients and consumers”. This convention also developed a set of pictograms tested which serve to test the understanding in individuals with a school deficit, as well as in individuals with a high academic degree.

USP pictograms were developed in the United States and the RAD-AR pictograms in Japan, and translate content differently. In general, USP pictograms are characterized by explicit figures, enriching their information, while the RAD-AR are more inexplicit and economical.

Since 2010, the International Pharmaceutical Federation has been emphasizing the importance of using pictograms in communication, and there is a need to validate pictograms and adapt them to different cultures.

Sometimes, pictograms are interpreted wrong and it is recommended to review and understand them before being used. Several studies have evaluated its legibility through two standards: the American National Standards Institute (ANSI), which considers a score of 85 % to be legible and the International Standards Organization (ISO) 3864, which adopts a score of 67 %, to be legible.

Keywords: Pictograms, USP, RAD-AR, Comparison

CHARACTERIZATION OF CONCOMITANT USE OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS) AND ANTIHYPERTENSIVES IN THE ELDERLY

Inês Silva

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In Portugal it is estimated that the prevalence of arterial hypertension (AH) is very high, 42%, similar to what happens in most European countries. High Blood Pressure (HBP) is influenced by age and aging is usually accompanied by a progressive increase in rheumatic diseases, especially osteoarthritis and rheumatoid arthritis. In the treatment of these populations the concomitant use of analgesics and anti-inflammatories, with emphasis on the use of non-steroidal anti-inflammatory drugs (NSAIDs) that is a reality in clinical practice. Considering the relevance of the use of antihypertensive and NSAIDs in the elderly, this study aims to study the interactions occurred and their pharmacodynamics when administered concomitantly.

A literary revision was made with resource to online databases PubMed® and Google Scholar® for publications between 2005 and 2017, exclusively for articles in Portuguese and English.

Simultaneous administration of NSAID increases blood pressure on average by 5 mmHg², mainly with drugs such as naproxen and ibuprofen. Usually, this adverse effect could be observed from the fifth day of simultaneous taking. NSAIDs may partially or totally antagonize the effects of many antihypertensive agents by blocking prostaglandins and inducing sodium retention. In this way, they can increase morbidity related to hypertension.

It is therefore necessary to evaluate the choice of NSAIDs to be used in hypertensive elderly patients, both in the medical prescription and in the pharmaceutical counselling and dispensing of over-the-counter dosage forms. To this end, a multidisciplinary cooperation between doctors and pharmacy professionals is extremely important.

Keywords: Antihypertensives, non-steroidal, anti-inflammatory, concomitant

References:

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MICROENCAPSULATION OF PHYTOSTEROLS AND/OR OTHER BIOACTIVE INGREDIENTS FOR MINIMIZING CARDIOVASCULAR RISK

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Several bioactive ingredients such as phytosterols, resveratrol, curcumin and catechin have shown efficacy in the prevention of chronic diseases, namely in cardiovascular diseases, one of the leading causes of death in the world.

In the case of dyslipidemia, a risk factor for cardiovascular diseases, the intake of phytosterols enhances the reduction of circulating levels of cholesterol, through a mechanism of competition with cholesterol for active places and receptors in cellular structures.

Studies show that resveratrol, curcumin and catechin promote antioxidant activity, inhibition of platelet aggregation and coagulation, anti-inflammatory and vasodilatory action, which are fundamental for the prevention or treatment of cardiovascular diseases.

Besides all the potentialities, many of these bioactive ingredients present the disadvantage of instability and sensitivity to environmental factors, for instance to the effect of light and oxygen, and are also characterized by low hydrosolubility due to its lipophilicity.

The microencapsulation of bioactive compounds emerges as a strategy to improve their stability, avoiding adverse conditions and promoting their bioavailability. It includes a set of several techniques that allows the coating of these ingredients through a protective film, to guarantee its protection and to modulate its release at the target cells.

Many techniques for the microencapsulation and different materials can be used, the choice depends on the intended application, the particle size, the release mechanism and physicochemical properties of both the active material to be encapsulated and the encapsulating agent. It is the aim of this study to review the available research in this field of expertise.

Keywords: Microencapsulation; bioactive compounds; phytosterols; cardiovascular risk

MEDICINES LABELLING – PUBLIC SAFETY PERCEPTION

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The use of medicines is an important aspect in many public health programmes (PHPs), which are designed to improve the health of a target population. Their importance refers not only because of their capacity to treat and prevent disease and to support PHPs, but also to the confidence of the public in the health policies of their countries which is inextricably linked to their confidence in the availability of medicines that are safe and effective.

All medicines carry some harm risks and it is important to monitor their effects, both intended and unwanted, so that good evidence becomes available to base an assessment of risk versus effectiveness or risk versus benefit.

Currently, medication errors and their negative consequences are a serious problem in our public health. The drug pathway is long and complex, consisting on several steps, during which medication errors can occur, that have various clinical repercussions with different severity degrees.

Similar or similarly named names of drugs have been identified as a potential source of errors for health care and for patients. A medicine whose packaging is visually similar to another medicine falls within the category "look alike". A drug whose generic or commercial name is similar to another, in written or verbal form, is categorized as "sound alike". These characteristics have led to unintentional swaps of medications that may result in increased morbidity or even death.

It is necessary to have procedures to prevent errors, improving the safety of patients.

Keywords: Medicines labelling, public health, safety

INHIBITION RECEPTOR FOR ADVANCED GLYCATION ENDPRODUCTS

André Marote

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Under normal circumstances, the receptor for advanced glycation endproducts (RAGE) exhibit a low constitutive expression in a number of cells. Nevertheless, they are fundamental in the recognition of advanced glycation end products (AGEs), increasing their expression under these conditions. AGEs are products formed by non-enzymatic reactions between proteins and sugars, being involved in the development of oxidative stress, inflammatory disorders, tumor growth, diabetic complications and neurogenerative processes.

RAGE receptors are present at cell membrane (fRAGE), causing an inflammatory response after binding to AGEs. There are also soluble isoforms (sRAGE) in the bloodstream responsible for the sequestration of these ligands, having thus a beneficial function. There is a great interest in this area in attempting to understand the mechanisms by which these receptors are involved or they may help to prevent the progression of chronic diseases, in particular the positive or negative effects of its inhibition. Some preclinical studies have already been conducted involving the inhibition of these receptors with antagonist molecules in some models of neurodegenerative diseases. However, possibly due to the fact that these molecules weren't specific for the membrane forms, a clinical trial was interrupted due to the adverse effects presented. Other studies have also shown that the presence of certain vitamins contributes to a greater expression of these receptors, and its role in the activation of RAGE isoforms and in the reduction of oxidative stress is unclear. Therefore, it is intended with this work to try to understand if the inhibition of the receptors would be something that would bring benefits to the organism and thus could be a therapeutic target.

Keywords: RAGE; inhibitor; stress; neurodegenerative diseases

GALLIUM-68: PRODUCTION, QUALITY CONTROL AND CLINICAL APPLICATION

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Gallium-68 is a radionuclide widely used in nuclear medicine for the diagnosis of tumors. This radionuclide has about 68 minutes (67.71 min) of half-life and decays in the majority by emission of positrons. This is mostly obtained from a parent radionuclide, the Germanium-68 with 271 days of half life.

This radiopharmaceutical is obtained in the form of Gallium Chloride, and is then purified and labeled with various peptides, antibodies and haptens, which makes it a very versatile radionuclide. The production of radiopharmaceuticals with this radionuclide allows the patient a low exposure to radiation, comparing with other radiopharmaceuticals.

Radiopharmaceuticals are considered injectable medicines, which require a specific quality control, within the parameters allowed by the European Pharmacopoeia in terms of organoleptic properties, radiochemical purity, radionuclide purity, chemical purity, residual solvents and biological control tests.

In general, this radiopharmaceutical is labeled with somatostatin receptor analogues, allowing a very precise diagnosis of neuroendocrine tumors and metastasis. It is also widely used in the clinic for detecting prostate tumors before low PSA values.

Keywords: 68-Gallium, Quality Control, Production, radiopharmaceutical

PALLIATIVE MEDICINE AND GALENIC PHARMACY

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Over the years, an enormous improvement in living conditions has been visible, which has boosted the increase in average life expectancy. This increase leads to the need for palliative care in chronically ill patients, in which, although the disease is incurable or progressive, there is a need to improve patient comfort and quality of life.

In this way, it is very important to implement this type of care to make this possible. Palliative Medicine is essentially the identification and early evaluation of the pathology with the main objective of preventing and alleviating suffering through the treatment of pain and other associated symptoms.

However, patients who are terminally ill often have a number of limitations in the swallowing of medications, as well as in the form of administration and dose of the specific drug marketed are different from the necessary, and there are even cases in which the patient does not have body mass required for the administration of injectables. In view of this, the intervention of the galenic pharmacy is necessary, through the preparation of magistral formulations, that is, personalized medicines adapted to the respective patient.

In conclusion, the galenic pharmacy is of great importance in palliative medicine, by providing alternatives that facilitate the administration of drugs in patients with chronic diseases and in the terminal phase, ensuring that these end their lives without pain.

Keywords: increased average life expectancy, palliative medicine, galenic pharmacy, medicines, chronic patients.

STABILITY PROFILE OF ORAL ANTIDIABETIC GLICLAZIDE IN SEMI-SOLID MATRICES (GUMS): APPLICATION IN PRE-CLINICAL PHARMACOLOGICAL TESTS

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Nowadays the pharmaceutical industry has tried to evolve in order to overcome the difficulties of adherence to the therapy by the patients, one of the ways to move in this sense is to adjust the way of presentation of the drugs, something that we call the pharmaceutical forms.

The various pharmaceutical forms have been developed to facilitate the administration of drugs to patients of different age groups or under special conditions, and to allow their better use.

Glicazide is an oral antidiabetic medication that belongs to the group of sulfonylureas, which is intended for type 2 diabetics, when the diet alone is not enough to restore glycemic balance, it acts as an insulin synthesizer and potentiates the insulin-secreting effect of glucose, increasing the response and faster food insulin secretion, this effect will decrease the peaks of postprandial hyperglycemia objectified by continuous glycemic registration.

As this is a pathology that affects individuals of different age groups, we think that it would be interesting to try to obtain a pleasant way to take the medication that would make it easier and comfortable to ingest, and therefore it is in our interest to verify the stability profile of gliclazide in semi-solid matrices (medicated gums), in order to facilitate its intake by pediatric and geriatric patients and to provide a further option to the existing pharmaceutical forms for the remaining patients.

Keywords: Glicazide, medicated gums, easier intake of medication

USE OF MELATONIN IN PEDIATRICS: RISKS AND BENEFITS

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Melatonin is a hormone produced mostly by the pineal gland in the brain and a small portion in retina. This hormone acts mostly in the brain himself, being responsible for the control of sleep cycles. Is usually released at night, stimulated by the absence of light. In the morning and during the day, the production of this hormone, is largely disconnected. About 15% to 20% of adolescents and children have difficulty falling asleep and maintaining a complete sleep cycle. In Portugal, melatonin was prescribed as a food supplement, not under strict regulation of the drugs, as is the case of benzodiazepines and psychotropic drugs. Melatonin has been shown to be effective in inducing and maintaining sleep cycle in children, including in children with ADHD, autism and other neurodevelopmental disorders, however there are studies that show that the use of melatonin has side effects at the level of the immune, metabolic and cardiovascular systems.

This article aims to verify the risks and benefits derived from the use of melatonin in pediatrics.

Keywords: Melatonin, pediatric, sleep in children and adolescents, sleep disorders, risks and benefits

VERIFICATION OF THE CHEMICAL PHYSICAL QUALITY OF FOLIC ACID-CONTAINING MANIPULATED CAPSULES.

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The quality of products handled in the master pharmacies depends on several factors, being the main production method itself. Despite the great advances, the process of manipulated production can not be compared with the great production of the industries, what makes quality of the manipulated products questioned several times.

So, the main objective of this work is to verify the quality of folic acid capsules through the tests of average weight, determination of content of active principle and uniformity of content, following specifications described in the Pharmacopoeia.

Folic acid of formula $C_{19}H_{19}N_7O_6$ is a vitamin classified as B9, which acts as a component for formation of structural proteins. During pregnancy, folic acid participates in the formation of the neural tube, being its determinant consumption to avoid serious fetal malformations. This is why capsules are made with this active ingredient for gestational supplement, also acting as a vitamin complex. The powders contained in the folic acid manipulated capsules are either simple or compound, must have uniformity in particle size and the same amount of active principle. Homogenization has fundamental importance, and techniques are therefore applied to ensure equality between the components of formulation. The techniques used to make the mixture and homogeneity of powders are: mortar and pestle, plastic sachet and automatic mixer. Quality control can be performed using physicochemical methods of folic acid-containing capsules that will be prepared by three different methods.

Keywords: folic acid; qualidade control; manipulated products

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INFLUENZA IN PREGNANCY

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Influenza is an infectious disease transmitted from individual to individual through saliva particles, mainly expelled through coughing and sneezing. It manifests itself by sudden onset and can last up to a week, presenting the symptoms more common high fever, dry cough and sore throat, general malaise. Most people recover quickly, but in individuals belonging to at-risk groups it can cause more serious complications.

Pregnant women represent a greater risk of serious illness and hospitalization due to influenza in comparison with other healthy adults and therefore represent one of the priority target groups for vaccination. During pregnancy, immunological and physiological changes occur that affect the respiratory system, cardiovascular and other bodies, putting the mother at risk for infections and their complications.

Vaccination of pregnant women is the only form of protection of the baby for the first 6 months of life, through the direct maternal immunization, giving an indirect protection of the child.

Despite the WHO recommendations of 2012 so that mothers are prioritized on vaccination in relation to other risk groups, the vaccination rate remains lower than the recommended, demonstrating the existence of possible barrier factors, such as lack of information, lack of lack of risks and fears about the safety and effectiveness of the vaccine.

In case of contracting the flu during pregnancy, the treatment should be as brief as possible in order to reduce the risks to the pregnant woman and the infant, through antiviral drugs and with additional measures, pharmacological and non-pharmacological, to reduce the symptoms.

Keywords: Pregnant; infant; influenza; barriers to vaccination; treatment.

USE OF MONOCLONAL ANTIBODIES IN CROHN'S DISEASE

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Crohn's Disease (CD) is described as a subcategory of inflammatory bowel diseases, characterizing itself as a chronic, transmural disease that can affect any part of the digestive tract. This disease involves, the small intestine and the large intestine in a segmental way with interposed areas, that is, it is characterized by having healthy segments that separate the inflamed segments.

Despite the development in knowledge, many aspects of its etiology remain unknown, evidencing that CD is a heterogeneous entity, characterized by genetic defects that lead to increase responses by the immune system. However, recent events suggest other possible etiologies that play a key role in the pathogenesis of this pathology, such as food, environmental factors, infections, among others.

This disease, being autoimmune, isn't curable medically or surgically, so that the main objective of the therapy is in the induction and maintenance of remission, restoration of a good nutritional state and improvement of the quality of life. The choice of therapy depends, mainly, on the severity and location of the disease, the side effects and the pharmacotherapeutic profile. Usually, it is focused on the use of corticosteroids, antibiotics, immunosuppressants and, more recently, on the use of biological therapies - monoclonal antibodies.

Monoclonal antibodies represent a pharmacological group of great therapeutic advancement for the treatment of autoimmune diseases. These are modifiers of the biological response that interfere with the inflammatory response, acting on the tumor necrosis factor, known as TNF- α .

Of all, Infliximab is the most studied antibody in CD, however, the anti-TNF's, Adalimumab and Certolizumab, among others, are also highlighted.

Although well tolerated, they may have associated adverse effects, as a result of inhibition of the activity of the molecule in the target tissue or due to interactions with other molecules.

Keywords: Crohn's Disease, treatment, biological therapies, monoclonal antibodies

ALTERNATIVES TO THE USE OF STATINS IN HYPERCHOLESTEROLEMIA

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Hypercholesterolemia is related to a cholesterol increase in the blood and is one of the main cardiovascular risk factors, along with high blood pressure, high levels of triglycerides, overweight, alcohol and tobacco abuse, among others.

Once cardiovascular disease is a worrying problem every day since they are cause of morbidity, disability and death.

Cholesterol, being a lipid, is transported in the blood bound to lipoproteins that vary in composition, size and density. The low density lipoproteins (LDL) are also known as "bad cholesterol" because they distribute the cholesterol by the body cells and when they are at high levels in the blood are associated with an increased risk of atherosclerosis and coronary heart disease.

A first line for the treatment of hypercholesterolemia are statins, however, these come along with complications associated with your use such as myopathy.

The word myopathy means "muscle disease", where it occurs problems in the contraction of skeletal muscles, which can range from stiffness, weakness with varying degrees of severity.

Adjacent to this, there are other natural alternatives (red yeast rice, plant sterols and beta glucan) that are indicated in the control of hypercholesterolemia, which make up the objective of this review. But these alternatives are still the subject of studies regarding their effectiveness and side effects.

In addition to pharmacological therapy, the practice of regular physical activity and food therapy are also forms of hypercholesterolemia treatment.

Keywords: Hypercholesterolemia, cholesterol, alternatives

NEW TREATMENT APPROACHES IN PERSISTENT PULMONARY HYPERTENSION OF THE NEWBORN

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Persistent pulmonary hypertension of the newborn (PPHN) is a severe syndrome of cardiopulmonary maladaptation which occurs following birth and mainly affects term and preterm newborns. This pathology is characterized by high pulmonary vascular resistance, low pulmonary blood flow, right to left shunt and consequently arterial hypoxia.

There are many identified causes to this disease, however, the most frequent is the meconium aspiration syndrome. Besides, it is known that the cause of disease determines the type and severity of future sequelae, further determining newborn survival.

Signs and symptoms usually appear in the first twelve hours of life, including cyanosis, tachypnea, nasal flaring, grunting, tachycardia and acidosis.

In which concerns to diagnosis, it can be performed by chest radiography, electrocardiogram, echocardiogram, cardiac catheterization, arterial blood gas analysis, pulse oximetry, hyperventilation test and cardiovascular magnetic resonance, among others.

The treatment is made with the aim of prevent injuries caused by hypoxia and barotrauma and secondary disorders should be treated simultaneously. Common therapies as inhaled nitric oxide, mechanical ventilation, surfactant, extracorporeal membrane oxygenation, vasopressor and cardiotonic agents and supportive therapies have many secondary effects and have proved insufficient.

New treatments development includes phosphodiesterase inhibitors, scavengers of reactive oxygen species, endothelin receptor antagonists, prostacyclin agonists, substrate for nitric oxide synthase, among others that are being tested. The overall advantages of these new approaches are oxygenation increase, mortality reduction and no clinically important side effects.

With this work is intended to characterize the disease and to identify the new treatment approaches in PPHN.

Keywords: Persistent pulmonary hypertension of the newborn; New treatment approaches

HORMONAL THERAPY IN PROSTATE CANCER

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The prostate is part of the male reproductive system being a gland, whose main function is to produce part of the seminal fluid. Male hormones called androgens, control the development and maintenance of male characteristics.

Prostate cancer (CaP) is a malignant tumor, named adenocarcinoma, sensitive to the action of certain hormones, including those that allow CaP evolution and growth, like testosterone.

Despite the slow progress and the late manifestation of symptoms, CaP can be diagnosed by performing the digital rectal examination, determination of prostate-specific antigen in blood or transrectal ultrasound scan. However, the diagnosis can only be confirmed by the result of the prostate biopsy.

When CaP is confirmed, is essential to make the disease staging in order to decide the best treatment possible and more conservative. Whenever CaP is already metastathised, usually is used standard hormone therapy treatment since CaP is hormone-dependent. This procedure uses medicines like hormones produced by the body itself, that is, who has the ability to reduce the amount of testosterone produced by the testicles and block the action of androgens or prevent the production of these.

However, this type of treatment is not without adverse effects, especially hot flashes, anaemia, weight gain, depression, diarrhoea, decreased libido, erectile dysfunction, fatigue, gynecomastia, nausea and osteoporosis.

Although CaP is very common, there are currently many therapeutic alternatives, even for later stages of the disease, associated with quality of life and hope for the future.

Keywords: Prostate cancer, diagnosis, treatment, adverse effects

OTOTOXICITY INDUCED BY PLATINUM-BASED DRUGS IN CHILDREN

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Ototoxicity is defined as the partial or total loss of the vestibular and/or cochlear function as a consequence of the use of drugs, generally use as therapeutical or by toxic exposure.

The platinum-based drugs - cisplatin, carboplatin, oxaliplatin- are widely used as anticancer agents in the treatment of numerous neoplasms. However, this drugs appear to have side effects, like the high ototoxicity that occurs due the destruction of cochlear ciliar cells that can not regenerate themselves. The buzzing represent the complaint more common in ototoxicity frames and can remain until the end of the treatment.

The degree of severity of ototoxicity depends on factors such as individual predisposition, dose, age, treatment duration, route of administration, a familial tendency and/or pre-existing damages. Otoacoustic emissions allow you to detect early signs of cochlear damage which enables the monitoring of ototoxic agents damage and prevent the occurrence of major compromises.

From the bibliographic analysis we can conclude that the age is a very relevant factor, that is showed by the directly proportional relationship with the probability of auditive complications. About the administered dose, studies show that 42% of patients that recieved a treatment with higher doses of cisplatin developed signs and symptoms of ototoxicity.

In this sense, the objective is to evaluate the influence of the previous described factors in the ototoxicity induced by anticancer drugs derived from plantinum in children.

Keywords: Ototoxicity; Children; Platinum-Based Drugs;

WATER POLLUTION AND CONTAMINATION

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Water is an essential resource and constitutes a fundamental necessity for health and survival of humanity, therefore, it is considered one of the basic rights. Water pollution is when men, directly or indirectly, insert substances or energy into the marine environment what leads to many harmful effects to the ecosystem, such as endangering living resources, representing a danger to human health and causing barriers to marine activities.

This study's goal was to investigate population's knowledge about water pollution and contamination. To achieve this goal, we made a bibliographic revision about this concern and inquired 27 habitants from Coimbra.

It was found that 96,3% of population has a little notion about what is water pollution. It was also found that 59,3% know the main sources of contamination, 40,7% know the three main ways of contamination and that just 55,6% has the right behavior to avoid water pollution.

We may conclude that it's an urgent need to make people aware of the saving water concern. Bearing in mind water's importance, some actions need to be taken and improved, such as recycling oil, buying biodegradable detergents, not throwing garbage or dump chemicals products in the water and cut down on the amount of electricity used, using only what is needed.

Keywords: Pollution, contamination, water, human health

QUALITY OF WATER RESOURCES AND ECO-SYSTEMAS

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According to the portal of education, water resource is a right of all. It attends to essential needs of human survival.

One of the crucial aspects of this job are the eco-systems, according to WordPress it's characterized as a community of living beings, in which vital processes are related between them. These concepts influence each other. The main objective is to establish a connexion between quality and quantity with the water resources and eco-systems through a systemized data analyses.

In the development of this project, it was used online research of scientific nature regarding dry outs, fires in Portugal, the melting of polar caps, river contaminations and their influences in quality and quantity of water and diverse eco-systems.

It was found that on severe dry outs, pollution or water contamination, caused mainly by the lack of hygienization of the surroundings environment and the snowbreak being the main responsible of animal death and vegetation. Still adding we have the human high consumption of renewable resources more than the planet can actually offer. Causing extinction of several species, not having a bigger control of this, there will be a decay in quality and quantity of life. Persisting problems, such as greater diseases due to the heat, less crops, farmer products, rise of the sea level and consequently floods.

In conclusion overseeing an anomaly in one of the water processes that will influence any area that it might come to, being water a cyclic movement.

Keywords: Words: Water resources, quality, quantity, eco-systems

INFLUENCE OF FIRE ON WATER QUALITY

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Portugal has been affected by several catastrophes, but the one that at this moment demands the concern of all are the fires, which destroyed thousands of hectares this year. After the fires it is necessary to verify the consequences that this will have for the environment and for the populations as in the level of the water and the burned land, but this has not been verified.

The ashes resulting from the fires will later be carried by the rainwater, to the dams where they will accumulate, as the ashes are nutrients will be growth of algae which may lead to the appearance of microorganisms that can cause health of the populations.

To carry out this project, a questionnaire was applied to several people in order to know if they are aware of the effects of forest fires in the waters available for the population.

From the questionnaire, it was concluded that 74% of the respondents stated that the fires would affect the quality of the waters, and when asked how they think the fires influence the waters, it is verified that 20% responded to water pollution with ash , 19% water contamination with ash and 18% ash transport.

Thus, it is verified that the population is aware that the fires influence the quality of the water for consumption.

Keywords: Fires, water and ash

WATER AS A SOURCE OF ENERGY

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Electric power is generated using different primary energy sources, relying on renewable energies (e.g. water) and non-renewable (e.g. coal). Water as a source of energy is a job where he will highlight what is hydropower (about 30%)

The objective of this work is to get the information about the importance of water and your energy use, as well as the sharing and promotion of this energy source. Aims to be as is the water in your liquid state can be used, so how anthropogenic form of energy.

As our literature review was made on the topic and an application of a questionnaire to 30 individuals, where if you can get to the fact that most of the people surveyed have heard or read about the subject where he obtained very positive results.

Reflecting on the answers obtained in parallel at issues can infer that most of the people surveyed pre-sents a vast knowledge on the subject. Where 83.33 (3)% of those surveyed responded that they know what is hydropower, about 76.66 (6)% of people surveyed showed know the advantages and disadvantages about and hydric energy as well as give an example; the same in India (76.66) shows know as the transformation of the current net energy force. Only 3.33 (3)% of respondents answered that they know that 30% of the energy in Portugal comes from hydropower.

It can be concluded that, although there is enough knowledge about the area administered, the surrounding population has gaps in the line of information presented, in particular the level of Portugal. For the work the outcome becomes positive, since it was presented and shared even more information, which can be an asset.

Keywords: Energy, hydric, electric, Renewable, Water

DISEASES RELATED TO WATER TRANSMISSION

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Water is essential for life. The amount of fresh water available in the World is limited and its quality is under constant pressure. Preserving the quality of water it's important for the supply of drinking water, food production and recreational water use. Currently there are several countries where the lack of water for consuming and its poor treatment lead to a prevalence of diseases caused by water contamination. The purpose of this work was to raise awareness in the community about the importance of this theme, for the reason that can compromise the health and well-being of all of us. It also aimed to present the existence of some of the major diseases caused by water pollution. The methodology used to carry out this work was the bibliographic review of several articles. Considering the results, we found that from the three diseases studied, infectious diarrhoea is the world's highest incidence rate (1.3 billion individuals) and the highest mortality rate (4 million individuals). We also find that infectious diarrhoea, malaria and cholera are more frequent in Asia, due to poor sanitation, low or no personal hygiene, and lack of treatment of drinking water. In conclusion, water is crucial to the human life, but can be at the same time the cause for transmission and development of many diseases. In underdeveloped continents, basic sanitation conditions are precarious, they do not have the same capacity for water treatment and water availability, therefore a sustainable management of disease prevention is necessary.

Keywords: Water, diseases, health

WATER WASTAGE

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Water is an essential natural resource for the survival of species that inhabit the Earth. In the human body, it represents about 70% of the body mass, regulates the internal temperature and is essential for all organic functions. In addition, water is also essential in the production of the food and is used for other purposes, for example in our personal hygiene, in the washing of clothes and utensils, in the irrigation of gardens, among others.

With this work we intended to verify the level of importance given by the people to the theme "Water waste" and to sensitize the school community and the rest to the problem of wasting water. We conducted a community survey with some questions related to the topic in question, where depending on each given answer, an assessment would be given in order to make the correct answer known.

In the survey, 90% stated that they turn off the water while putting the shampoo. 5% said they put a container to reuse the water while it warms up for bathing. 78% of people turn off the water while brushing their teeth. 4% have a habit of throwing papers and other objects into the toilet. Through this survey we can realize that there are habits that people present that must be changed, since they lead to lack of water.

The waste of water is still very current, a precious thing as water must be preserved, so it's necessary to have awareness and people change their habits.

Keywords: Wastage Water. Awareness.

ACUTE EFFECTS OF SLEEP DEPRIVATION ON ELECTROCARDIOGRAPHIC AND TENSIONAL PARAMETERS

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As is known to the general population, sleep is an important repair mechanism regulated mainly by the circadian rhythm that helps and controls various functions, highlighting the cardiovascular function responsible for regulating heart rate and blood pressure, being studied in this research project, both of which exhibit circadian oscillations. The circadian rhythm reports physical, mental, and behavioral changes that occur over a 24-hour cycle, regulated primarily by light or darkness in the surrounding environment. The daily influence of the circadian rhythm will reflect, in normal individuals, in a drop of body temperature, blood pressure and heart rate, which prepare the person to sleep. By the early hours of the morning the reverse occurs, preparing the person to wake up.

Longitudinal studies have shown that sleep privation and interrupted circadian rhythm affect cardiovascular pathogenesis, with progression to various diseases including hypertension. Studies discussed in this section suggest further that sleep loss (less than 7 hours per night) can have extensive effects on the endocrine, immune and nervous systems.

Sleep privation is also associated with AMI and stroke. Five hours of sleep or less are associated with a 45% increase in the risk of cardiovascular disease. Acute sleep privation (4 hours) for only one night results in an increase in blood pressure in healthy youngsters, and may provide a biological mechanism for observed associations between sleep privation and cardiovascular disease.

Keywords: Eletrocardiographic avaiation; Tensional avaiation; Sleep Deprivation

ASSESSMENT OF AUTONOMIC RESPONSES EXISTING DURING THE EXPOSURE TO DIFFERENT MUSICAL PATTERNS

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The effects of music on the cardiovascular system began to gain emphasis when it was studied in humans in which a decrease of the heart rate (HR) and blood pressure (BP) was caused, and it is suggestive that music has an effect on the autonomic nervous system (ANS) being able to modulate several parameters at the cardiac level such as heart rate (HR), blood pressure (BP), respiratory rate (RF) and electrodermal activity (EDA).

Some studies have shown that there are inconsistent results regarding physiological responses caused by the effects of music, which may justify the different methodologies used to obtain results. The variability of the HR is the physiological parameter that has been most used to observe the activation of the sympathetic and parasympathetic nervous system (branches of the ANS), in which it is regulated by numerous circuits involving structures of the brainstem and intrathoracic cardiac ganglia, which are under the influence of structures involved in regulating emotions. Usually, emotional modulation is associated with the predominance of the sympathetic activity of the ANS, which causes the increase of the HR, while the parasympathetic activity leads to a decrease of the HR. In addition to HR, HRV and electrodermal activity may also be used for the same purpose. Other studies have revealed musical influences on human physiology as well as changes in brain structures known to modulate cardiac activity such as the hypothalamus, amygdala, insular cortex and orbitofrontal cortex.

Keywords: Musical Patterns; Autonomic Responses; Autonomic nervous system; Cardiorespiratory system; Heart Rate

VARIABILITY OF HEART RATE IN SPORTS

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The cardiovascular system is mostly controlled by autonomic regulation through the activity of the sympathetic and parasympathetic pathways of the autonomic nervous system (ANS), which dynamically controls the body's response to a range of external and internal stimuli, providing physiological stability in the individual playing an important role in cardiac regulation.

The analysis of heart rate variability (HRV) has been studied in recent years as a promising variable to relate the autonomic nervous system to fatal cardiovascular accidents. The appearance of accessible and reliable instruments in the market, compared to the usual ECG, has led to the fact that HRV parameters are currently related to several objectives in the sports field, namely the relationship that the nervous and cardiac systems establish with various physiological situations, HRV being a reliable measure of the balance of the cardiac autonomic nervous system and differs according to health conditions, physical preparation, intensity and training conditions.

The relationship between the autonomic regulation of heart activity, assessed through heart rate variability (HRV) and the different states of training and fatigue, that characterizes the training process in athletes, remains unclear. The aim of this research is to compare HRV among athletes of different sport modalities, as well as to identify the influence of each sport modality on HRV.

Keywords: Variability, Heart Rate, Athletes

HEART RATE VARIABILITY: HOLTER VERSUS ECG SHORT TERM STUDENTS IN HIGHER EDUCATION IN THE FEMININE GENDER

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The autonomic nervous system has as objective the preservation of homeostasis, which, through the parasympathetic and sympathetic nervous systems acts on the sick sinus, modulating heart rate. The variations existing between each heartbeat, with the subject at rest, represent the regulatory mechanism setting the rate to rate, reflecting the effects of the SNS and PNS and physiological mechanisms.

The heart rate variability (HRV) consists in measuring the time interval between heartbeats, varying depending on certain factors such as heredity, physical condition, exercise type, technical skill, position of the body, environmental variation, moods and hormones, drugs, stimulants or eating habits.

The emergence of market instruments and programmes, accessible and reliable compared with the usual equipment for electrocardiography, right now the parameters of HRV are being studied, in particular in relation to the nervous and cardiac system establishes with various physiological situations. The HRV is a reliable measure of cardiac autonomic nervous system balance and differs depending on the health of each individual. The relationship between the autonomous activity of cardiac activity, assessed by heart rate variability (HRV) with these two instruments (holter ECG and short-lived) is still a bit unknown.

Keywords: Heart rate variability, Holter ; short term ECG

INFLUENCE OF PERMANENT NIGHT WORK ON BLOOD PRESSURE

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The night work regime, as part of the development of society, leads workers to a predisposition to the imbalance and disturbance of various physiological variables. When they follow a routine with schedules contrary to those of the chronobiological standard, they are subject to several alterations, among which it finds the alteration of circadian rhythm normal arterial pressure (AP). From the modification of this rhythm, characterized by a decrease in BP at night and by an increase as the diurnal period begins, of a propensity for a pattern of arterial hypertension (HTA) is suspected. Taking into account that results obtained in several studies are not totally indicative of a correlation between the change in blood pressure values and permanent night work, it is intended that this study objectively confirm the existence, or not, of the same and obtain a better understanding of this problem increasingly more present on society. About methodology of data collection, will be used the technique of ambulatory arterial pressure monitoring, in order to obtain 24 hours recording of the same, and a questionnaire will be used to obtain information about the participants that can be relevant to the study. The sample will be composed for 25/30 individuals subject to a night work schedule. After collecting data, will be realized the statistical treatment and will be to compare the results obtained with other articles within the same theme and line of research, extracting more later the appropriate conclusions of the study.

Keywords: Permanent night work; Arterial pressure; Hypertension;

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SCREENING: IN THE BLOOD - CHIKUNGUNYA VIRUS

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Chikungunya (CHIKV) is an arbovirus of the genus Alphavirus of the family Togaviridae.

It consists of a capsid protein with genomic RNA wrapped in molecular structures, presenting a spherical shape.

The transmission of the virus is mainly through the bite of insects-vectors of the genus *Aedes*, and can also be transmitted through contaminated blood products or by vertical transmission. In 2016, there were 146914 confirmed cases with Brazil, Bolivia and Colombia being the most affected countries. In 2007, it was recorded the first transmission of the virus in Europe.

Abrupt onset of fever, often accompanied by swelling and joint pain (especially in the lower back, ankles, knees or wrists) are common signs and symptoms along with muscle pain, headache, nausea, fatigue and rashes.

Estimated transfusion risks range as high as 150 per 10,000 donations during outbreaks. Possible measures to prevent CHIKV transfusion transmission include deferral of symptomatic donors, discontinuing blood collections in affected areas and CHIKV nucleic acid screening of donations. Assay tests for CHIKV RNA are not available yet and given the highly geographically and temporally sporadic nature of outbreaks, there may be considerable reluctance to develop and implement them.

Any case of infection by the post-transfusion virus should be immediately communicated by the hospital to the Blood Service which has distributed the blood components involved, thus using a hemovigilance where the blood service must perform a look-back procedure, with the aim to identify recipients of blood components obtained from potentially infectious blood donation.

Keywords: Chikungunya; virus; transfusion medicine

SCREENING BLOOD: DENGUE VIRUS

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The dengue virus belongs to the Flaviviridae family, Flavivirus genre and so far have been described 4 serotypes of this virus (types 1, 2, 3 and 4). It measures from about 40 to 60 nm in diameter, possesses a capsid protein, is involved by an envelope where the membrane proteins and the glycoprotein spicules are inserted.

The genome's constitution is a single RNA strain of positive polarity. *Aedes aegypti* mosquito is the main transmission vector of this virus, though there are other forms of transmission such as blood transfusion and organ transplantation.

The virus uses the membrane receptors in order to infect the hostess cell and with its mechanism it is able to replicate the genome and produce new viral particles. This way tests can be performed in order to track especially through virus isolation, detection of antigens and serological tests (e.g. ELISA) and detection of nucleic viral acids (RT-PCR and isothermic amplification method) and Dengue virus' tracing is made through treatment and new ways of protection and prevention.

In the past few years has been an increase of dengue outbreak. Nowadays it is considered endemic which brings harm to transfusion medicine. Some cases have been reported where transfused individuals were infected and also on blood donors in apheresis. Screening has allowed reducing the number of individuals infected.

Keywords: Dengue virus, blood transfusion, screening

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SCREENING: IN THE BLOOD - HEPATITIS E VÍRUS

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Hepatitis E is caused by hepatitis E virus (HEV) that has tropism for the hepatocytes with consequent inflammation of the liver. This disease was previously known as hepatitis non-A and non-B, is transmitted mainly fecal-oral route. This type of hepatitis becomes more severe during pregnancy and in the fetus can cause acute liver failure.

The incubation period of this virus ranges from 15-60 days, but can be detected in serum on first two weeks after transmission.

This virus can be detected by serological tests, the most common method is ELISA, this test is based on the detection of Anti-HEV antibodies, IgM and IgG, to determine the stage of the infection, since this virus does not evolve to chronicity, it is only relevant to do Anti-HEV IgM for the diagnosis of this pathology, since this marker is typical of acute infection. We can also screen Anti-HEV IgM+IgG, but it is only relevant to know if the individual has already had contact with this pathology, being a marker for epidemiological studies. Serum levels of ALT, AST, bilirubin and alkaline phosphatase are also evaluated, these types of screenings are not performed in donors, and only in Portugal is checked serum levels of ALT and AST.

We can also detect the viral load through the RT-PCR method where we search the genomic RNA of the virus.

There are some cases of the epidemic outbreaks of HEV in Portugal as the communication routes are increasing and our country maintains close relations with the Africa's ex-colonies.

Keywords: ELISA; Anti-HEV; Screening; Hepatitis

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SCREENING: IN THE BLOOD – MALÁRIA

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Malaria is an infectious disease caused by *Plasmodium* species (*P. falciparum*, *P. vivax*, *P. Malariae*, *P. oval*), being pathogenic for humans. Is transmitted by the bite of the infected female *Anopheles* mosquito. In rare cases, the infection is acquired through direct inoculation of infected blood through accidental exposure, blood transfusions or vertical (mother to fetus). On human body, the parasites multiply in the liver, then infect red blood cells (RBC). The main groups at risk are children, pregnant women, travellers and emigrants. The most affected areas of the globe are African, Region of the Americas, Eastern Mediterranean, South-East Asia and Western Pacific. The diagnosis is based on the clinic sintomatology and in the laboratory research of *Plasmodium*, via observation of blood smear, of antigens and antibodies produced by the host in the serum using immunofluorescence tests, Immunoenzymatic tests and DNA research using molecular biology techniques.

Malaria still is one of the biggest social health problems worldwide, mainly affecting populations living in tropical and subtropical regions. Being transmitted via RBC transfusions, screening in the blood of the donators is crucial. Since the transmission is different in endemic and non-endemic areas, the screening is equally different. In endemic areas is made to every donator. In non-endemic areas, although the incidence of the infection is lower because of globalisation, being necessary to screen all the samples that in the pre-donation questionnaires are considered risky.

Keywords: Malaria, *Plasmodium*, Blood Transfusion, screening in the blood, donator.

SCREENING: IN THE BLOOD – *BABESIA*

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Babesia is a protozoan parasite that infects Red Blood Cells (RBC) causing a disease known as babesiosis or piroplasmosis. This emerging infectious disease was first documented in Romania in 1888 uniquely in cattle and sheep. The first human case was identified in 1957 in Croatia, on a farmer after contact with cattle's tick. The man presented fever, anemia and hemoglobinuria. Symptomatology begins between one to six weeks after the tick's bite.

Babesia species spreads through the infected tick's saliva and although more than 100 species have been reported, relatively few have caused documented cases of human infection. These include *B. microti*, *B. divergens*, *B. duncani* (found in rodent, cattle and dog's ticks, respectively) and MO1. Besides the tick-borne transmission, the human infection can also occur from vertical/mother-to-child transmission during pregnancy or delivery, or from a contaminated blood transfusion.

Infected packed RBC transfusions were identified through testing the donor's blood for *B. microti* antibodies, and though there's an infectious risk associated with these transfusions, there are no current screening tests available for blood donors.

Babesiosis culminates in two major processes: the RBC modification by the pathogen (evolution to hemolytic anemia and tissue hypoxia) and the stimulation of the host innate immune response to the pathogen. These processes end up leading to the most common clinical findings in infected people: lysis of the erythrocytes, hyperbilirubinemia, elevated indirect bilirubin fraction, elevated serum lactate dehydrogenase (LDH) and sometimes the leucocyte counts are slightly decreased.

Keywords: *Babesia*, Babesiosis, Tick-borne, disease, Red Blood Cell

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SCREENING: IN THE BLOOD - ZIKA VÍRUS

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Zika virus belongs to the family Flaviviridae, is a virus capped and has a nucleic acid the RNA, it has a transmission pathways *Aedes* mosquitoes (same vector of dengue) via sexual, vertical and blood transfusion. The virus internalizes the cell and by the action of a reverse transcriptase, transforms its RNA genomic into DNA that later fuses with the DNA of the host cell and multiplies. Symptomatically presents mild fever, rash, conjunctivitis, joint pain, discomfort, headache and leads to neurological complications in adults, appear 3-14 days after infection and only 1/5 people express them, so it is important screening to donors who have traveled to endemic areas, if transmitted vertically leads to brain defects in fetuses or abortion. It has no specific treatment, it is only possible to control fever and pain, ingest water and protect against new bites. The diagnosis is based on the clinical history, places visited and analytical tests taking samples of blood, saliva, semen and urine. Screening tests and viral load quantification using blood samples are divided into two groups: nucleic acid (NAT) tests whose purpose is to identify and quantify viral RNA present in the body and serological tests that aim to detect antibodies against the virus. NATs are: RT-PCR (real-time reverse transcription PCR), culture (inoculation of serum in cells and detection of viral particles), COBAS (detection of plasma RNA). The serologicals are: EIA (enzyme immunoassays), IFA (immunofluorescence), PRNT (Plate Neutralization Test).

Keywords: Zika Virus; blood; serological test; RNA.

SCREENING : IN THE BLOOD – ROSS RIVER VIRUS

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Ross River virus (RRV) belongs to the family *Togaviridae*, which contains the genera *Alphavirus*. It is a mosquito-transmitted virus endemic and enzootic in the Western Pacific. RRV is a small, enveloped virus with a single-stranded positive-sense RNA genome containing 11.553 nucleotides, coding four nonstructural proteins, a capsid protein and three envelope glycoproteins. Following the bite of an infected mosquito, RRV particles are inoculated and attach to a cell surface receptor, then the virus penetrates and is uncoated within the cell. Primary replication occurs in skeletal muscle, subsequently, RRV enters the blood, where clearance is mediated principally by neutralizing antibodies (Ab) and type 1 interferon. RRV usually incubates for 7 to 9 days. The individuals affected by the RRV experiment identical symptoms such as fever, fatigue, muscle aches, skin rashes and debilitating arthralgia.

Suspicious cases can be confirmed by blood tests measuring two classes of ab IgM and IgG, only confirmed positive if IgG $\hat{A}b$ levels are detected in two separate blood samples two weeks apart in a four-fold rise. Tests for RRV viral RNA can also be performed, but its use is limited early in the course of the disease. There is no specific antiviral treatment for RRV and no vaccine to prevent its infection. Therefore, it is only used medicine to reduce the symptoms. Prevention is based on avoiding mosquito bites.

Since the infection of RRV includes an asymptomatic viraemic period the potential for transfusional transmission has raised awareness, taking into account that other arboviruses are known transfusion-transmissible pathogens.

Keywords: Ross river virus; mosquito-borne; disease; polyarthrititis

SCREENING: IN THE BLOOD - WEST NILE VIRUS

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West Nile virus (WNV) is an arthropod-borne virus most commonly spread by infected mosquitoes and belongs to Flavivirus genus, family Flaviviridae. There's also a very small number of cases registered in which WNV was spread through blood transfusions, organ transplant, transplacental transmission and breast milk. The virus was first recovered in Northern Uganda close to the river Nile in 1937. Nowadays WNV has almost worldwide distribution. Being endemic in parts of Africa, Asia and the Middle East, parts of Europe, American and Caribbean Islands. After the infection, the virus has an incubation period of 2 to 14 days. The risk of infection is higher among people who work outdoors (farm, near rivers, e.g.) due to the exposition to mosquitoes, as well as elderly and people with the immune system affected. Approximately 80% of infection is asymptomatic, but WNV can cause body aches, joint pains, vomiting, diarrhoea, febrile illness, encephalitis or meningitis. Diagnosis based on laboratory tests of blood or spinal fluid. These tests detect antibodies against the viral infection and allow the monitorization of therapies. They could be of two types ELISA (IgM or IgG) and haemagglutination inhibition test. Whenever the result is positive, confirmatory tests are performed. Those consist in the search of nucleic acid of the virus (RNA) with the help of reverse polymerase. Nowadays there is no vaccine to prevent or medications to treat WNV. Since the virus can be transmitted by blood transfusion and organ transplantation, it is important to detect it in donors, especially those who have travelled to endemic areas.

Keywords: West Nile Virus, Mosquito bite, Diagnosis, Front-line test

CONTROL OF MICROBIAL GROWTH

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Microorganisms are indispensable to human life, but a small number of these living beings interfere with some of human's activities causing disease and sometimes death.

Trying to reduce these situations, several strategies have been developed. As procedures that inhibits or kill microbial growth (chemical) and barriers that don't allow their transfer (physical).

The present work aims to evaluate the ability and efficacy of chemical methods of microbial control when applied to Gram+ (*Staphylococcus* sp.) and Gram- (*Klebsiella* sp) bacteria.

Four detergents and one disinfectant (3 household and 2 laboratory) were tested by the addition of 1 mL of bacterial suspension to 9 mL of detergent, at time intervals of 5, 10, 15 and 30 minutes, and were inoculated in TSA medium with loop of 10 μ L, for 24 hours at 37°C.

The results were obtained by counting the number of colonies. They showed that the lye is the most effective control method, and there were no CFUs formed at T0 for both bacteria. The others are not as efficient either because the action of time is necessary, or their action doesn't affect bacterial growth.

Based on the results, we can see that there's a significant difference between the chemicals used in the home and those used for laboratory, which only act to eliminate the bacteria. This has some importance, since they have different goals and objectives. Household products are used as a cleaning method rather than as disinfectants, unlike laboratories that are used specifically to eliminate bacteria.

Keywords: Microorganisms, chemical methods, efficiency, Gram + and Gram-

MICROBIOLOGICAL ANALYSIS OF WATER FOR HUMAN CONSUMPTION

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The waters intended for human consumption must comply with sensory, chemical and biological requirements. However, directly or indirectly, the water can be subject to contamination resulting from sewage waters or of excrement coming from another source.

To ensure water quality and safeguard public health, it is necessary to carry out the purification of raw water intended for human consumption and make the treatment of waste water contained in the sewers.

The experimental procedure performed intends to illustrate the assessment of bacterial indicator of faecal contamination.

To evaluate the contamination of drinking water was made an analysis of 3 water samples of public source and 3 samples of private wells. The procedure consists in the enumeration of fecal and total coliforms, fecal enterococci, total heterotrophic and detection of sulphite-reducing spores, based on the technique of filtering screens, through incorporation, with selective culture media for each type of microorganisms.

All samples have at least one of the values above the reference value for one of the microorganisms in analysis. With the results of the analysis we can see that none of the analysed waters is good for consumption.

In addition to the organoleptic characteristics, such as physical appearance, color, smell, taste and chemical composition of the water, it is important to do the assessment of bacterial indicator of faecal contamination because this allows us to discover possible contamination or pollution that modify the water.

In conclusion, it is important to note that it is necessary to pay attention to the water that we consume, since although this seems good for us consumption might be contaminated, being detrimental to our health.

Keywords: Microorganisms contamination indicators, Water quality, Public health.

MICROBIOLOGICAL ANALYSIS OF LETTUCE

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Microorganisms are associated with food, which, although they present nutritional value to those who consume them, are susceptible to microbial development, especially foods harvest from the soil that are incorrectly washed and disinfected. Diseases such as food poisoning might be transmitted by food. Through microbiological surveillance, it's possible to detect and control microorganisms (pathogenic and altering), which is essential to ensure the safety and health of food and to act in the prevention of foodborne illnesses.

This work aims to compare the microbiological quality of lettuces that were subjected to different washing and disinfection treatments.

For the research of total coliforms, using the plating method in VRLB, were analyzed three distinct samples of lettuce: two samples of packed lettuce and prewashed (ready to eat) and one lettuce from a school cafeteria. The counting of the colony forming units (CFU) of total coliforms was: 36×10^4 CFU/g, 44×10^4 CFU/g and $2,85 \times 10^3$ CFU/g, respectively. In these results, the two samples of the bought lettuce ready to eat presented countings of total coliforms superiors to 10^4 CFU/g, which, according to the guide values established by INSA, are considered "unsatisfactory", but the sample from the school cafeteria presented analytic values which classifies it as "acceptable".

According to these results, it's pertinent, to guide and educate the food manipulators and the community in general to food hygiene, since the production until the food consumption, passing through the conservation and manipulation of those, to the good manufacturing practices and the risks associated to the contaminated foods.

Keywords: Food security, microorganisms, control, food quality

HISTORY AND EVOLUTION OF GALENIC PHARMACY

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For years, a Pharmacy and Medicine were seen as one, where the same individual was responsible for being a doctor and a pharmacist. This connection lasted until the thirteenth century.

The term Galenic Pharmacy was only introduced in the middle of the sixteenth century, referring to Pharmacy of complex drugs, which opposed drugs containing well-defined chemicals.

For many years medicinal substances available to man were only constituted by animal, vegetable or mineral nature. Later, with the isolation of the active principle, Man had the temptation to replace the drugs above.

In Galenic Pharmacy, this substitution is becoming more pronounced (as the modern Pharmacopoeias prove) by several factors such as: economic reasons, need for preparation of stable drugs for the longest possible period of time, ease of administration, greater therapeutic efficacy, etc.

Galenic Pharmacy was developed by having expanded, the initial concept, and is currently responsible for the transformation of all medical substances into drugs, being a complex and multifaceted science, divided into relatively recent areas such as Biopharmacy and Clinical Pharmacy in which the first one has the purpose to determine the relations between the physical-chemical properties of the drugs, its mode of administration and the biological effects observed, and the second is in particular care of the physical, chemical or biological incompatibilities of new (increasingly potent) drugs.

Keywords: Galenic Pharmacy; Pharmacist; History

MEDIEVAL PHARMACY IN PORTUGAL

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In medieval times the most recognized names in the medical-pharmaceutical environment in Portugal were: S. Frei Gil and Pedro Hispano. S. Frei Gil stood out for the medical practices with Arabized galenic lines and magic-religious slopes. Pedro Hispano wrote the famous "Thesaurus Pauperum", which described various diseases and their cures.

Also in the Middle Ages the spices had a widespread use for therapeutic purposes, entering into the composition of many medicinal products, both as active and as corrective drugs. "Teriagueiros", sellers of the celebrated "teriaga", a medicine containing 64 different components, was considered an antidote to poisons.

The first document referring to the pharmaceutical profession in Portugal was a diploma promulgated by D. Afonso IV in 1338, which established that all the doctors, surgeons and apothecaries in the city of Lisbon were obliged to be examined by the king's doctors. Becoming insufficient to respond to the epidemic crises of the time in 1449 D. Afonso V granted the "Carta de Privilégios dos Boticários" that assigns several privileges to the apothecaries.

In 1461, D. Afonso V promulgated another letter that determined the complete separation of the medical and pharmaceutical profession. This letter prevented doctors and surgeons from preparing medicines for sale and prohibited anyone else from selling compound medicines to the public in locations where there was an apothecary, where they were prevented from advising any patient's medicine.

One of the most relevant aspects of pharmaceutical education in the Middle Ages was the organization of pharmaceutical studies at the University of Coimbra.

Keywords: Spices; "Carta de Privilégios dos Boticários"; Middle Ages

PHARMACEUTICAL CAKES

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At the beginning of the 16th century, the theme “Galenic Pharmacy” was created with the aim of representing the pharmacy of complex medicines. These resulted from transformations of natural products, the so-called drugs, into pharmaceutical preparations constituted by mixtures of components which were susceptible of being administered to patients. The notion of Galenic Pharmacy, has suffered an accentuated evolution, since it is nowadays known for transforming all medicinal substances into drugs.

Cakes are pharmaceutical forms with a consistent form and a spherical shape. They are intended to be administered orally, without chewing, so due to that they are used by veterinary medicine. They look similar to pills, whose weigh is normally between 1g and 50g. Cakes are obtained through a mechanical division that involves a rudimentary process, once it is a manual manipulation, without recurring to pilulators. To a firm, plastic and adhesive mass is given the shape of a cylinder that is cut in as many portions as the ones we want to prepare. Nowadays, this pharmaceutical form has been replaced by pills and gelatin capsules, which results in a cheaper making-process.

Now, these pharmaceutical preparations are only of historical interest. We can say that there has been a huge development of the pharmaceutical industry and its techniques, which makes it the complex and multifaceted science we know today, way different from the antique one that was based on empiricism.

Keywords: Pharmaceutical cakes; Galenic form; Veterinary

PHARMACEUTICAL BISCUITS

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The pharmaceutical biscuits is a galenic form constituted by water, salt and flour, to which it is possible to add active substances. It was created with the aim of facilitating the administration of medicines, mainly in the veterinary field. One of its advantages is the accuracy of the doses, since the preparation is done according to the medical prescription. Thus, it is possible to adapt the ideal dosage for each animal, avoiding the reduction of waste and costs.

The manipulation of the biscuits involves cautions. Among them, the standardization, the forms of preparation of biscuits must have standardized cavities and must be heat resistant. The choice of ingredients is an important aspect, since the biscuit should contain in its composition ration without addition of dyes and irritants. The size of the cookie depends on the size of the animal and the amount of active substance. Biscuits also present restrictions, are not indicated for the incorporation of bitter pharmacologically active substances, and the addition of thermosensitive substances should be done carefully, due to the need to heat certain biscuits. Another care is the quality control, especially the importance to evaluate the organoleptic characteristics and the weight of the biscuit. The packaging should be made in milky pots. If the biscuits contain photosensitive drugs, they should be individually wrapped in lead paper before being placed in the pots.

Pharmaceutical biscuits are not widely used galenic forms, except for veterinary use. Thus, they facilitate the act of medicating the animals, especially the dogs.

Keywords: Pharmaceutical biscuits; Veterinary; Galenic form

PHARMACEUTICAL CHOCOLATES

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The pharmaceutical chocolates are preparations obtained by mechanical division, from the mixture of chocolate with one or more medicinal substances, which can be ingested, and maybe chewed.

The Mesoamerican civilizations were the first to use this product to therapeutic purposes, in the form of medicine. Later, it was used for the treatment of angina, dental problems, colds, dysentery, asthenia, and others pathologies.

Some authors proved that, when chocolate was added to the Jamaican pepper, which was used to the menstrual treatment, and when added to the vanilla, would strengthen the heart.

In 1769, the chocolate came to be used as excipient to mask the bitter flavor of the medicines, method still applied.

Initially the chocolates were prepared from the mixture of the cocoa with sugar, which added the drug or drugs desired, submitting the mixture to grinding in mortar. Then, was added glycerin or common syrup. Posteriorly, have been obtained blending the chocolate with drugs in heated mortar.

Most of the pharmaceutical chocolates have purgatives drugs.

In conclusion, although chocolate has been seen as a very beneficial pharmaceutical form, nowadays this practice isn't used, once with the advance of time it has been concluded that these dosage forms don't have the effects previously described.

Keywords: Chocolate, Galenic form, Medicinal substances

PHARMACEUTICAL SACRAMENTAL BREAD

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Pharmaceutical sacramental bread or amylaceous capsules were one of the first pharmaceuticals pills, consisting two cupolas of round shaped, unleavened bread, biconvex in the central part and flat on the edges. Inside these products solid medicines were pulverized. In the old days they were divided into two types: cupolas for humid-closing and cupolas for fitting or dry-closing.

These pharmaceuticals pills presupposed with powders prepare which they must be divided evenly. The packaging was related to the number of cupolas with the amount of powder that she can receive, the choice of the made capsules were taken considering the volume of the powder. The powders portions could have been made by a powders division of usual methods into papers or dosed spoons Finot, or by the metering compressors. Sacramental bread should weight 0,5g, for control purposes. To prevent changes, these pharmaceuticals shapes were prepared at high temperatures thus ensuring stability, but sometimes issues appeared such as powders incompatibility. These incompatibilities had the advantages of avoiding both taste and smell of a lot medicine and an easy stomach degradation, which lead to rapid drug action. As a disadvantage they couldn't been coated.

The sacramental bread had been of great usage, passed into the background over the years, being replaced by other pharmaceutical shapes, such as the gelatinous capsules, because they have the advantage of a higher production revenue and better conservation.

Keywords: Sacramental bread; Pharmaceuticals pills; Cupola; Amylaceous capsules

MOLDED TABLETS

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Molded Tablets, a disused solid pharmaceutical form, are similar to pills and lozenges, and are also known as "trituration tablets". They are a complementary form to powders, which is mainly intended for gastrointestinal administration and should be swallowed without chewing. They can also be used in the preparation of solutions for hypodermic use.

The molded tablets are obtained by molding mixtures of medicinal substances in a special equipment. The molding device consists of a perforated plate corresponding to the area of the molded tables to be prepared.

As for excipients, kaolin and calcium carbonate are used in trituration tablets intended for gastrointestinal administration. For hypodermic use, lactose, sucrose, glucose and sodium sulfate are used (sucrose produces harder molded tablets than lactose).

The most common used drugs in the form of molded tablets are mercurous chloride, potassium permanganate, silver nitrate and alkaloids.

Molded tablets intended for gastrointestinal administration must satisfy the disaggregation or dissolution rate tests of the lozenges and may be packed as tablets or as lozenges. Molded tablets for hypodermic use should be dissolved in distilled water within 2 minutes. These ones should be shipped in hermetically sealed glass jars, which are sterilized prior to packaging.

Currently, molded tablets are not used, being replaced by tablets as a pharmaceutical form.

Keywords: Molded Tablets; Oral Administration; Solid Pharmaceutical Form

ANIMAL JUICES

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Juices are solid or pasty extractive liquids or solutions taken from animal or plant cells. They are obtained by spontaneous flow or by the intervention of mechanical operations, such as: incision, decantation, expression, centrifugation and filtration.

Animal juices come from secretory liquids or cellular fluids and may be in the liquid state or as solids of varying consistency. They do not apply as they are obtained, but are administered after suitable treatments, transforming them into pharmaceutical forms.

There are some animal juices that are drugs of pharmaceutical interest. Lard, used in lotions and soaps, is composed of a fat, which contains arachidonic acid attributable to unsaturated fatty acids. Spermaceti, used in the manufacture of creams and ointments, has emollient properties. The snail baba, composed of elastin and glycolic acid, helps in the removal of dead skin cells, acne treatment, hydration, etc. Hyaluronic acid, of bacterial or avian origin, is commonly used, in aesthetics, in the filling of wrinkles and expression lines. Caprylic acid is a natural fatty acid, used in the treatment of candidiasis. Keratin, of animal origin, is a widely used ingredient for hair care. Although the current medicinal importance of juices is low, the technology of obtaining them continues to have pharmaceutical interest.

Keywords: Animal juices; Natural origin; Galenic form

VEGETABLE JUICES

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Vegetable juices are liquid and solid pharmaceutical forms or solid and pasty extractive solutions, withdraw from vegetable cells. They are obtained by spontaneous flow or prepared by mechanical operations.

Depending on their main element can be divided into watery, oily, resinous, balsamic, etc. As a pharmaceutical form the most advantageous is the watery juices, which can be classified as: sugary, herbaceous and acids.

The watery sugary has a large percentage of sugar and a considerable amount of organic minerals. They are obtained by expression, through strainers or presses. With pharmaceutical importance and interest, there is the manna and licorice. The manna is obtained by incisions on the Fraxinus Ornus and F. excelsior and it's used as a laxative. Licorice is obtained from the dried roots of the plant with the same name, by action of the water and the subsequent expression.

The watery herbaceous are obtained by expression of herbaceous plants such as watercress juice that it's antiscorbutic and cabbage juice, associated with the combat against gastric ulcer.

Watery acids are characterized by the predominance of organic acids. They are obtained from fruits such as blackberries and apples and are used in the preparation of syrups and extracts.

This pharmaceutical form was long used by the ease with which its constituents are found in nature. Currently, its medicinal importance is low, it is most frequently used pharmaceutical forms such as pills, capsules or syrups. However, the technology used in its obtaining continues to have interest in the galenic pharmacy.

Keywords: Vegetable juices; Pharmaceutical form; Expression; Extraction.

MEDICINAL CIGARETTES

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Medicinal cigarettes are a pharmaceutical form consisting of triturated and dehydrated herbs, which usually is added a solution to facilitate their combustion, the cigarette is a narrow tube of cut tobacco (or other similar material) included in paper and designed for smoking. The use of this pharmaceutical form may be related to the various medicinal plants, which have been used since the earliest times for the treatment of diseases, and have been excellent for the development of drugs.

The medicinal cigarettes act through the fumes released in the combustion that, when they are aspirated, are not subjected to the first passage through the liver once they are sent through the airways, thus allowing a greater speed of action of the active principles of the plant, this being a great advantage.

One of the plants used in this pharmaceutical form is atropa belladonna, very poisonous to possess alkaloids. In case of its use in cigarettes, it relieves asthma, bronchitis and pertussis. Another plant that is intensely related to this pharmaceutical form is Cannabis sativa, which has long been known as one of the most valuable drugs we had. The plant may be used in various forms for absorption of its psychoactive compounds, among which is the cigarette form.

Medical cigarettes were no longer used as pharmaceutical forms after some time due to the irrational use of them, which served as a relief for some evil became a social habit quickly ceasing to be seen exclusively with therapeutic effect.

Keywords: Medicinal Cigarettes; Natural drugs; Pharmaceutical forms

SPECIES

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Galenic form is defined as the final state of active substances after being submitted to the necessary pharmaceutical operations, in order to facilitate the administration and obtain the highest therapeutic effect desired.

Active substances are submitted to the pharmaceutical operations because most of them can't be directly administrate to the patient.

Species may be defined by mixtures of plants or parts of dried plants divided into small portions, to which chemically defined compounds may be added.

So, species is a galenic form obtained by mechanical division, which is destined to obtain other galenic forms.

Nowadays, this pharmaceutical form, which has fallen into disuse, had the purpose of obtaining more complex pharmaceutical forms, such as infused macerates, digestion or cooking. That is, species were not directly a pharmaceutical form, but an intermediate process for the definitive preparation of the drug.

In what comes to the preparation of the species is very important to highlight quality of the drug that will be used. It is necessary to identify the nature of the drug (diagnosis) and verify its state of conservation.

During the preparation of the species, fragments of the same size, coming from the same part of the plant, must be mixed together, so the leaves would be mixed with the leaves, the flowers with the flowers.

In relation to the conservation of the species, these should be kept in glass bottles with ground stoppers and left in a dry place, protected from light. They can also be stored in cellophane bags or card boxes. It is not advisable, the shelf-life exceeds one year after its preparation due to the nature of the species and their bad packaging, which change over time.

Keywords: Species; Galenic forms; Mechanical division; Parts of plants

PULPS

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A pharmacological form consists on the final state that the active substances present at the end of pharmaceutical operations, which aims to facilitate its administration and obtain a greater therapeutic effect.

The pulps are very simple pharmaceutical forms of soft consistency which are obtained from the pulping. This consists on an operation of dividing fresh pharmaceutical materials, using plants, part of them or animal organs with the use of soft and fleshy areas and rejection of the fibrous or hard parts of the drugs used. Already fallen into disuse, the pulps were usually divided into animal and vegetable pulps.

Under this designation of pulps we will consider two complementary pharmaceutical forms: preserves and electuaries.

Preserves are forms obtained by mixing sugar with medicinal substances of vegetable origin.

Electuaries are pharmaceutical forms of soft consistency, consisting of complex mixtures of pulps, extracts, vegetable powders, etc., which are aggregated by means of syrups, honey, mellitus, medicinal wines and liquid resins. Electuaries intended for human medicine must have consistency of pilular mass while those used in veterinary medicine for thick honey. For proper consistency, powders such as licorice, althea or flour are included in the preparation of some electuaries.

Keywords: Pulps; Pulping; Preserves; Electuaries

THE EVOLUTION OF THE GALENIC PHARMACY IN PORTUGAL

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Since the golden age, the population has been concerned with the development of the pharmacy. Initially this desire to know more was intimately connected with religious beliefs but it evolved into the knowledge we have today.

The most important historical facts that we know of came from Galen, considered the "Father of Pharmacy", who systematized for the first time the raw materials needed to prepare the medicines. Galen created medicines according to Hippocrates' theory of moods.

In Portugal, the first apothecaries appeared in the thirteenth century, but before that there were spice sellers, who used spices for therapeutic purposes, and the most relevant and used was sugar.

In 1338 was promulgated by D. Afonso IV the first document concerning the pharmaceutical profession that is known in Portugal.

Several books began to appear in the seventeenth century, appearing the Lusitanian Pharmacopoeia and the Pharmaceutical Collection. At the level of the regulation, the pharmaceutical sector began to undergo control, appearing in 1931 the Regulatory Commission of the Chemical and Pharmaceutical Products and being issued several decrees like the Decree no. 39633 of 1954, that establishes the regime of packaging, and more recently the Decree no. 267 of 2006 which is the status of the medicinal product.

The pharmaceutical sector is constantly evolving and is changing at every moment, for the benefit of consumers.

Keywords: Galenic Pharmacy; Galen; Portugal

PRIMITIVE AEROSOLS

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Aerosol was defined as a colloidal system consisting of a gas with little particles dispersed. This definition was changed in 1957. It was established that this pharmaceutical form consisted of a product held in a container that was released as a dispersion upon the action of a force.

According to the first definition of aerosol there are natural aerosols, such as smoke and haze, and aerosols with pharmacological action, which may involve the use of complementary machines or not.

Within the aerosol without the need of complementary equipment, we have the antiasthmatic cigarettes, used in order to exercise the asthma medication in bronchial tree, and the fumigations, that come from the combustion of elements and served to disinfect environments or body parts.

Relative to the aerosol combined with equipment, those that fit the most the second definition of aerosol, we have the atomizers, the insufflators, the vaporizers and nebulizers. The atomizers release the solution through a pressure generated in their tubes; the insufflators free the particles in the respiratory tract and may cause some irritation; the vaporizers disperse water or volatile liquids at gas form, on which the particles have tendency to aggregate, making that a disadvantage of this machine. The nebulizers are used on asthma situation, with bronchodilator end, or topic end on the nasal mucosa. They are activated through a pressure on the walls of the recipient that is caused by an object with pear shape.

Nowadays the aerosols are dispensed in individual packages, making the application easier.

Keywords: Primitive aerosols; Suspencion; Pharmacological action

GRANULES

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Granules are solid pharmaceutical forms similar to pills, weighing no more than 0.05g, made of substances associated to sugar and/or adjuvants. Very active drugs, that are part of their composition, are administered in dosages of mg or fraction of mg.

The "F.P IV" distinguishes two types of granules: Of arsenic anhydride, that are made to contain 1mg of arsenic anhydride per gram; and of Strophanthin, which should contain only 0.1mg of strophanthin per gram. Different quantities of the active ingredient demand the adoption of different preparation techniques (prior dilution with lactose).

The preparation of granules and pills is similar, which usually uses a mixture of lactose and acacia gum as an excipient, with water and syrup added. A "magdaleão" is prepared, which consists of a viscous mass of active ingredients and excipients obtained after adding the simple syrup to the mixture of powders. The preparation of the "magdaleão" consists in moulding the obtained mass so as to form a cylinder with a uniform diameter. Then, the cylinder is sectioned in equal parts by a pill machine, therefore obtaining the granules.

The granules should be stored in stoppered bottles and protected from light to guarantee a good conservation.

Nowadays, the granules only have an historical interest, being replaced by tablets and soft gel capsules, of less traditional and more economical production.

Keywords: Granules; Magdaleão; Protect from light

FOOD SECURITY: IMPLEMENTATION OF A HACCP SYSTEM

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Food security plays an extremely important role in promoting the health of the population, which encompasses a set of procedures that must be applied from the production, transport, storage and confection of food to the physical-chemical, microbiological and sensorial characteristics. The present work aimed to implement a food safety management system, HACCP. The elaboration and schematization of this system is based on a preventive methodology that was executed according to the reality.

In this work we applied the implementation phases of HACCP and the checklist that we used was taking into account the legal framework.

Some conformities and nonconformities were found using a system of analysis and identification of hazards and respective preventive measures to be implemented. The Critical Points were identified as being 9 in total: Receiving the raw material at the freezing and cooling temperature; Storage of the raw material at the refrigeration and freezing temperature; Defrosting; Confectionery; Cooking; Disinfection and Storage. These Critical Points require greater control and it was established for each one of it each critical limits, monitoring, corrective measures, verification procedures and a system of records.

In conclusion, there were some nonconformities and conformities in this establishment; all nonconformities must take immediate action, like the lack of hygiene, the incorrect storage and lack of identification of the frozen food. Compliances were also registered, like the exterior access door with mosquito netting protection, the hand washes with paper wipe devices and soap, the kitchen lamp with adequate protection, among others.

Keywords: Food Security; HACCP; Critical Points; Hazards; Control

IMPLEMENTATION OF THE HACCP SYSTEM IN A RESTAURANT

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The evolution of the population's quality of life and the growing concern about food has triggered a new definition of safe food, it is product obtained, preserved, transported, processed, offered for sale or consumption and prepared under conditions that ensure the control of hazards and agents of diseases to man. Food safety is the set of standards for the production, transport and storage of food, aiming at certain physical-chemical, microbiological and sensorial characteristics standardized.

The objective is to determine the conditions of a restaurant, characterizing the space (hygiene in the industry), check hygiene and sanitation, transportation and reception, storage and hygiene of workers, to develop a manual of good practices.

The methodology used is HACCP - Hazard Analysis and Critical Control Point, which is currently the internationally accepted benchmark for implementing food safety systems.

The results obtained in this restaurant reveal that the disinfection and cleaning is according to the requirements, with floors of easy cleaning and non-skid, daily cleaning of the space of meals, whenever necessary. The cleaning of the place of preparation, in terms of temperature, both the refrigerators and the frying oil was in agreement. There are records of the entry of raw materials, such as, frozen and meats. All products received are analyzed in terms of color, smell, appearance and packaging.

Today more than ever, food safety is a central concern for citizens and responsible bodies, as well as a prerequisite for strengthening consumer protection.

Keywords: Food safety, HACCP, hygiene, food quality

IMPLEMENTATION OF THE HACCP SYSTEM IN A BARBECUE

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HACCP - Hazard Analysis Critical Control Points, consists of a food safety management system, which is based on the analysis of the various stages of food production, in the identification and assessment of potential hazards, implementation of preventive measures for its control, focused on prevention and not analysis of the final product, in order to ensure that unsafe food is not available to the consumer.

The aim of this work is based on the identification of hazards in a barbecue, in particular the reception stages of the products, in cold storage and at room temperature, in the preparation and confection of food products, when placing food on the grill, in the cooking, in the cutting of the ingredients and portioning. After identification, it is intended to apply the measures aimed at preventing contamination.

As methodologies, a research was done in scientific articles with the HACCP theme and to what extent this system can prevent the various types of contamination of the food, besides that, a visit to the establishment was made.

During this process, we identified the various critical points (receiving of raw materials and confection of ingredients) where the dangers (physical, chemical and biological) are most notorious, the various types of contamination, the microorganisms that cause food poisoning and the preventive measures for example compliance with good hygiene practices of equipment and also the training of personnel.

In conclusion, it should be noted that a correct implementation and and proper use of the HACCP system can prevent many of the food-borne illnesses that can affect the lives of customers and consumers and so, ensure a good quality of food that is served to the public.

Keywords: HACCP, barbecue, food poisoning, preventive measures

IMPLEMENTATION OF A HACCP SYSTEM

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Food security should be seen as only an important aspect of overall food quality and HACCP as a food safety control mechanism is a key component of food quality control programs.

The hygiene and safety of manufacturing and food processes should be a norm in the catering sector as a basic guarantee of the services it provides to the consumer.

The purpose of this study was to carry out a visit to a restaurant and beverage establishment and the interpretation of the results of this evaluation.

This article is based on the bibliographic review of scientific articles. Elaboration of a checklist based on HACCP. A manual of good practice based on HACCP has also been developed. After application of the on-site checklist, it was identified the conformities and nonconformities of the establishment.

In terms of nonconformities we found that these are mainly in the reception of food, lack of pest control, lack of periodic examinations by employees, among others. On the other hand, the hygienization of the facilities, utensils and manipulators was very good, although no microbiological analysis of the site was carried out.

Based on these parameters, we have created a manual of good practices for the implementation of corrective and preventive measures.

The isolated implementation of a HACCP system in a food industry does not provide total safety for consumers. Hence the need for control from the producer of raw materials to the act of consumption

Keywords: HACCP system; Ckecklist; Food Safety; raw material; food manipulators

METABOLIC EFFECTS OF COFFEE IN TYPE 2 DIABETES MELLITUS

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Type 2 diabetes is a chronic disease with an increasing incidence rate and high rates of morbidity and mortality. On the other side, coffee is one of the most consumed drinks worldwide, and its association with various diseases has important public health implications.

Review the association between coffee consumption and the risk of type 2 diabetes.

The literature was reviewed by searching in research databases such as “PubMed” and “Scielo” the following keywords: “coffee” and “type 2 diabetes”. The articles particularly concerned on evaluating the relation between these two variables were selected.

Several studies report an inverse association between the coffee consumption and the risk of type 2 diabetes. Previous systematic reviews that analyzed studies up to 2009 and 2014 confirm this hypothesis, and provide further insight about the mechanisms behind this relation. Coffee contains a mixture of different substances, such as caffeine, chlorogenic acid, isoflavonoids, magnesium and trigonelline. Caffeine improves glucose tolerance by activating the energetic metabolism, and increases the insulin sensitivity as well as the secretion of insulin from β -cells of pancreatic islets through activation of ryanodine receptors. Furthermore, the chlorogenic acid restrains the effects of glucose-6-phosphatase, inhibits the absorption of glucose in the small intestine and prevents hepatic production of glucose. Besides, it is also advocated that the high content of antioxidants of coffee leads to oxidative stress reduction, which in turn creates adverse conditions for the development diabetes.

Keywords: Coffee, type 2 diabetes mellitus, caffeine, chlorogenic acid, trigonelline

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THE IMPACT OF PHYSICAL EXERCISE DURING OVER 12 HOUR FASTING

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Carbohydrates (CHO) are the major mean of Adenosine Triphosphate (ATP) production and due to that, they also represent the main source of energy to the human body. This production of energy can be compromise when our body is exposed to periods of fasting, in which, blood glucose levels are low, and homeostasis is achieved by glycogen mobilization and gluconeogenesis from protein precursors.

When people perform physical activity after a period of 12 hours fasting, their carbohydrate stock and glycogen, become low and their body is forced to change catabolism to derive energy from fat and body protein.

Once all glycogen is exhausted, the body will be forced to undergo yet another metabolic transition to provide proper nourishment to central nervous system while saving as much body protein as possible.

Concluding, the practice of physical exercise while fasting can not only, change our bodies composition, as also have awful consequences in our health.

Keywords: Fasting, physical exercise, carbohydrates, glycogen and fat

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VITAMIN D: PHOSPHOCALCIUM METABOLISM

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Vitamins belong to micronutrients class. Vitamin D plays an important role in human metabolism by acting as a hormone. Moreover, she is the special key to ensuring bone mineralization by affecting the phosphocalcium metabolism.

Their needs are amplified in pregnant women, lactating and growing children.

She can be both synthesized from the diet - through enriched milks, fish oil, egg yolk - as from the sun, with UV rays. Being ingested in her inactive form.

It is presented under two forms - D2 and D3 - both inactive forms. After being ingested she is incorporated into chylomicrons and led to the liver. It undergoes to a first hydroxylation, forming the 25-hydroxyvitamin D (25 (OH) D). Later, the kidney undergoes to a second hydroxylation, forming her active form 1,25-dihydroxyvitamin D (1,25 [OH] 2D).

In the small intestine is stimulated the intestinal absorption of calcium, in osteoblasts leading to the osteoclasts by increasing bone resorption and in the kidney stimulates the reabsorption of calcium.

Vitamin D deficiency causes a decrease in plasma calcium by decreasing the release of calcitonin, leading to hyperparathyroidism. There is higher liberation of parathyroid hormone (PTH) from the parathyroid glands, acting in the kidney to form active vitamin D. This compensatory response allows the absorption of calcium even at reduced vitamin D levels.

It also has other biological actions such as: inhibition of cell proliferation, induction of terminal differentiation, inhibition of angiogenesis, stimulation of insulin production, inhibition of renin production and stimulating the production of macrophages.

Keywords: Vitamin D, Metabolism, Mineralization

THE DARK SIDE OF THE FAD DIETS

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Despite often being unbalanced in terms of macronutrients and suppressing various vitamins and minerals rapid weight loss diets without sacrifices are becoming more fashionable these days , for example the low-carbohydrate, protein-rich diets.

Effectively, this diet is nutritionally inappropriate, leading to harmful consequences for the organism that may be the origin of:

Diabetes: Low HC consumption not only increases cholesterol levels that will trigger insulin resistance, but also increases the amount of reactive protein that, at high levels, triggers inflammation, leading to the development of diabetes.

Intestinal diseases: The replacement of HC with proteins as an energy source increases the formation of ketone bodies. These decrease the appetite, aid in dehydration and promote calcium loss from bones. In turn, this will increase the calciuria, acidifying the blood, weakening the intestine that is defenseless against pathogenic bacteria.

Renal Function: Due to the increase of ketone bodies, the prolonged use of this diet leads to the excretion of ketones in the urine. Kidney ketone excretion is accompanied by sodium elimination, causing increased diuresis and decreased blood pH.

Bone problems: Excessive consumption of proteins leads to the production of acids from protein catabolism. To maintain blood homeostasis calcium is recruited, leaving the skeleton in order to serve as a buffering agent, thus compromising of this tissue.

These are just a few diseases originated by this diet, which are the outcome of so many other "fad diets". It is then imperative to seek nutritional advice whenever you want to start a diet.

Keywords: Low carb diets; Fad diets; nutritionally inappropriate diets; disease

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DEMYELINATING DISEASES

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Myelin sheath is a coating composed by proteins and lipids, that surrounds the axons of the nervous system. A large amount of the white matter is formed by myelinated axons. Besides protecting axons, myelin sheath accelerates the propagation of nerve impulses, which makes nervous communication more effective. Therefore, changes in this coating will cause significant damage. Demyelination refers to loss of this sheath which leads to nerve fibers exposure, disrupting the electrical nerve impulse, causing neurodegeneration. Genetics, strokes and inflammation are some of the major known causes. Demyelination tends to be segmented, with different areas being affected sequentially or simultaneously. Remyelination can also occur. However, extensive loss of myelin generally leads to irreversible degeneration of the axon and cell body. This pathological process is at the origin of demyelinating diseases. Demyelinating diseases can be classified according to their pathogenesis like demyelinating due to inflammatory processes and viral demyelination. The most known demyelinating disease is multiple sclerosis. Most common causes are thought to be related to autoimmune, genetic, viral, and environmental factors. There is no known cure. Another example of demyelinating disease is Acute-disseminated encephalomyelitis that affect mostly children. In opposition to MS, a pproximately 80% of patients make a full recovery. Typically, this diseases can affect vision, audition, reflexes, movement, mood and incontinence. There is no cure for demyelinating diseases or to prevent their progression, but early treatment can help. Therapies available may include drugs to alleviate fatigue and pain, physiotherapy and muscle relaxants.

Keywords: Myelin sheath, Demyelinating diseases

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CHRONIC PAIN

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Chronic pain is mostly defined as an untreatable pain that endures beyond the expected time of healing of an injury or disease. Frequently it's described as a pain that persists more than three to six months.

This endurance leads to limitations, for example the reduction of functional and motor capacity, which affects the patient's psychological well being. When we refer to chronicle pain syndrome we conclude that the consequences can aggravate resulting from the prolongation or bad treatment of chronicle pain.

Researches estimate that medical community is finally starting to face chronicle and ghost pain as a plausible disease because it can cause structural brain changes that increase the risk of depression.

In other words, when the tissue is traumatized an action potential is triggered and afterwards is interpreted by the central cortex, but in the absence of a pain inhibition mechanism any injury would be felt while the healing process lasted. Therefore it will occur a discharge of endorphins that inhibit the electric impulse so that the spreading of information doesn't happen. In case of chronic pain the pain stimulus is superior to the inhibition stimulus.

Thus the pain control can be supported by the insertion of morphine or by non pharmacologic approaches such as physiotherapy (by nervous stimulation), acupuncture and hypnosis.

Chronic pain, not only is the correlation between pain and memory, but also can appear due to system disorders responsible for the perception of pain and also system disorders responsible by its inhibition, such as fibromyalgia.

Keywords: Pain, inhibitory synapse, limitation

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MUSCLE ADAPTATIONS TO PHYSICAL EXERCISE

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Muscles are tissues responsible for the contraction and distension of cells that originate movements, leading to physical exercise. Muscles are composed by fibers divided into type I and type II. The first ones contract in a slower and longer way and are found mostly in muscles important for long-lasting activities. On the other hand, fibers type II have an increased velocity of contraction and are more frequently used in anaerobic energetic metabolism.

In muscle contractions, we can highlight isometric contraction (when a muscle contracts, producing strength without macroscopic modification in the articulation angle) and isotonic contraction, which includes concentric and eccentric. The concentric happens when there is a shortening of the muscle while the eccentric implies its stretching.

Regarding the types of physical exercise, they are distinguished by the need or not of oxygen. The anaerobic consists in great intensity and short duration, not depending on the oxygen. On the other hand, aerobic has a small intensity and long duration, requiring oxygen.

During the practise of exercise, several modifications occur with the purpose of providing energy to the muscle tissue involved and maintaining local and systemic homeostasis. These adaptations are classified as acute or chronic. Acute modifications happen immediately and include the increasing of blood flow to muscle tissue, vasodilation as well as the increment of sweat and heart rate. Concerning chronic alterations that arise later and aim to increase tissue's mechanical resistance and its functional ability, we can emphasize muscle hypertrophy, bone strengthening and the rise of fluid retention.

Keywords: Fibers; Contractions; Acute/Chronic adaptations

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MYOKINES-HORMONAL FUNCTION OF THE MUSCLE

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Muscles have an ability to act like endocrine organs. Its contraction stimulates the production, secretion and expression of cytokines or other peptides derived from muscle fibers- myokines.

The release of myokines is induced by physical exercise and influences the communication between different organs in an autocrine, endocrine or paracrine way. These proteins are essential in the prevention of several metabolic pathologies, such as insulin resistance, atherosclerosis, neurodegeneration, decrease in bone formation, type 2 diabetes, obesity, cardiovascular diseases, cancer and osteoporosis, since it has an ability to stimulate signaling of AMP-activated protein kinase, increase glucose uptake, and enhance lipolysis.

In conclusion, physical activity is an essential component of any lifestyle because it is intended to reduce intra-abdominal fat, inflammation and risk of chronic diseases, derived from a sedentary lifestyle.

A new paradigm was defined when it was discovered that the contraction of skeletal muscle tissue secretes proteins: skeletal muscle is an endocrine organ that produces and releases myokines, which have a hormonal function, causing specific endocrine effects in other organs. Thus, myokines, induced by the practice of physical exercise are involved in local anti-inflammatory ends and in systemic mediation.

Keywords: Myokines, Homonal, Muscle

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HORMONAL FUNCTION OF BONE: OSTEOCALCIN

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Bone has classically been viewed as an inert structure that is necessary for mobility, protection of internal organs and calcium homeostasis.

Osteocalcin is the most abundant noncollagenous protein of bone matrix, released during bone formation, but its precise function in bone metabolism has not been fully elucidated. It is a product of differentiated osteoblasts, formed by 46 to 50 amino acids. Once transcribed, osteocalcin undergoes posttranslational modifications within the osteoblast before its secretion, which results in the production of carboxylated – deposited on mineralized bone matrix - and undercarboxylated osteocalcin - released into the circulation - in a process that is calcium-dependent. Many studies on mice models in which osteocalcin production was inactivated or increased have shown that this protein have an important endocrine function outside bone, suggesting an endocrine role of skeletal system on energy metabolism. Experimental studies have demonstrated that the circulating undercarboxylated fraction of osteocalcin increases insulin secretion and sensitivity, lowers blood glucose and also decreases visceral fat. This protein has also been identified as an important regulator of male fertility, due to the hormonal role as a mediator of testosterone secretion. The correlation between osteoporosis incidence and diabetes incidence may lead us to the recognition of the osteoblast's implication on glucose metabolism. Thereby, the better understanding of the endocrine role of osteocalcin in patients with diabetes or other metabolic disorders and may provide clues for the low testosterone levels frequently described in diabetic men.

Keywords: Osteocalcin; osteoblast; glucose; metabolism.

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ELETROCARDIOGRAM

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The electrocardiogram (ECG) is a non invasive medical exam that measures the electrical activity of the heartbeat. This exam detects cardiac dysrhythmias, myocardial infarction, coronary diseases, increased heart cavities, among other diagnostics.

An ECG lead consists of two surface electrodes of opposite polarity (one positive and one negative) or one positive surface electrode and a reference point. The bipolar limb leads (I, II, III) show the difference between two electrodes of opposite polarity and they form the Einthoven's Triangle. This law is of great value when interpreting an Electrocardiogram. It allows us to determine whether the limb electrodes are correctly placed; if not, this law does not hold allowing us to realise the ECG is not correctly done. The unipolar limb leads (aVR, aVL and aVF) register the potential difference between a theoretical null point at the centre of the triangle and the electrode of each extremity. The precordial leads (six unipolar chest limbs - V1, V2, V3, V4, V5, V6) have the exploring electrodes located anteriorly on the chest wall and the reference point located inside the chest.

The leads should never be analysed separately, but as a whole, as each lead is a different perspective of the same electric stimulation.

The interpretation of the resulting pattern consists on the reading of three entities:

- P wave – atrial depolarization followed by atrial systole;
- QRS complex – composed by Q, R and S waves represents ventricular depolarization followed by ventricular systole.
- T wave – ventricular repolarization.

Keywords: Eletrocardiogram; leads; wave

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PHYSIOLOGY OF BONE REABSORPTION: VITAMIN D, CALCITONIN AND PTH

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Bones play an important role in regulating blood calcium levels and serve as the main reservoir for this mineral in the human body. Calcium moves to the inner side of the bone as osteoblasts build new bone, and to the outer side of the bone as the osteoclasts degrade bone tissue.

When blood calcium levels are too high, the activity of the osteoclasts decreases.

The PTH is the main hormone that regulates the levels of calcium in the blood by increasing absorption in the intestine and reabsorption of calcium in the kidneys.

If the blood calcium level decreases, PTH hormone production increases by stimulating the formation of vitamin D in the kidneys. As for vitamin D, it stimulates calcium absorption in the intestines, regulates bone mineralization, and differentiates the osteoblasts and the bone matrix synthesis.

The PTH regulates RANKL/RANK system. This system controls osteoclasts formation, activation and survival in normal bone modeling and remodeling. The osteoclasts activity leads to bone resorption and the release of calcium by increasing calcium blood levels.

Calcitonin has the bone tissue as main tissue-target. This is the opposite of PTH and binds to receptors in osteoclasts, decreasing these activities and increasing the lifespan of osteoblasts.

The increase in blood levels of calcium stimulates the thyroid gland to secrete calcitonin.

In case of loss of calcitonin, it is possible that hormones such as PTH and vitamin D can compensate.

Keywords: Bone reabsorption; vitamin D, Calcitonin, PTH

MECHANISMS OF ANGIOGENESIS

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Angiogenesis is a physiological mechanism that consists in the development of new vessels from pre-existing vessels. However, this process shouldn't be mistaken with vasculogenesis, a similar process, but occurs from a primitive endothelial cell and hematopoietic cells, during the embryonic period.

There are several factors that stimulate angiogenesis, including growth factors and cytokines. However, the most prominent pro-angiogenic substance is VEGF, which is produced by tumor cells and fibroblasts and is responsible for stimulating the proliferation and migration of endothelial cells. There is yet another group of important molecules in the process of angiogenesis, the Angiopoietins, which bind to specific receptors, stimulating the binding of VEGF to the endothelial cell, causing angiogenesis.

This phenomenon is essentially divided into four stages: production of the protease enzyme, migration and proliferation of endothelial cells induced by VEGF, the formation of the vascular tube by the stimulation of cytokines and, finally, stabilization of the new vessel.

This process occurs mostly in adult life in physiological processes, such as ovulation and endometrial development, and non-physiological, such as wound healing, tumor growth, etc. However, the deregulation of this mechanism gives rise to several pathologies, either by excess, such as AIDS and neoplasia or by insufficiency, such as ulcers and heart diseases.

Angiogenesis can also be used to fight diseases characterized by poor vascularization. The application of specific compounds can inhibit or induce the creation of new blood vessels in the body, helping to fight certain pathologies.

Keywords: Growth factors; cytokines; VEGF; Angiopoietins

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AUTONOMIC NERVOUS SYSTEM AND EXERCISE

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The Autonomic Nervous System is responsible for the maintenance of homeostasis, therefore, for the maintenance of physiological balance with the surrounding environment. It's part of the Peripheral NS and controls the major part of the involuntary and unconscious activity of the organs.

The Autonomic NS is divided in sympathetic NS and parasympathetic NS. The first relates to fight-or-flight situations and the last is more active in rest situations. So, during workout, the sympathetic NS is more active and in calm situations, our body is more influenced by the parasympathetic NS.

When we begin physical activity the sympathetic NS is activated releasing noradrenaline in the α and β_1 receptors. During the workout, the neuroendocrine pathway is activated. In other words, the Sympathetic NS communicates with the suprarenal and it produces adrenaline, which is released in the bloodstream and goes to the target cells, connecting with β_1 and β_2 receptors. This last pathway causes a slow but long-term response. In general, the sympathetic NS increases the heart rate, vasodilation, pulmonary ventilation, availability of energy resources and blood vessels constriction in non-used tissues during exercise.

In the rest period, the Parasympathetic NS is activated releasing acetylcholine in the muscarinic receptors. It decreases heart rate, contracts the bronchia, the pupil and the bladder. It also stimulates the pancreas, gallbladder and stomach.

People who exercise regularly have greater parasympathetic activity and less sympathetic activity. Thence, athletes have a higher cardiac mass, less heart rate and are able to absorb more oxygen from the air.

Keywords: Homeostasis, sympathetic, parasympathetic

ASSESSMENT AND CONTROL OF OCCUPATIONAL RISKS IN HOSPITAL STERILIZATION CENTERS

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The Material and Sterilization Center is a vital and fundamental unit of the hospital context, whose function is to provide materials free of contamination to be used in a wide variety of hospital procedures. Those who don't work in the sector often don't know the complexity of their activities. This study is being developed and its main objective is to evaluate the occupational risks to which the workers of the Hospital Sterilization Centers are exposed. The specific objectives are to identify hazards and evaluate occupational hazards, to apply semi-quantitative studies of ergonomics and analytical studies, namely, lighting, thermal environment and air quality, and to carry out professional risk control plans. The study was classified as a "transverse" type.

We conclude that there is a clear undervaluation of the workers affected in this sector, as well as the activities carried out there, perhaps because it is a closed sector, in which people do not interact so much with the external environment, or even because people do not know the relevance of the work in the Sterilization Centers. In addition, there are many complaints and health problems reported by workers in this sector, depending on the activities performed there.

Keywords: Material and Sterilization Center, occupational risks, health problems

ASSESSMENT AND CONTROL OF OCCUPATIONAL RISKS IN HOSPITAL MORTUARY

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Certain categories of health work are perceived as having a greater risk inherent in health and with specific characteristics. For this reason, the present study focused on the hospital mortuary services, a work with multiple risk factors.

Mortuary workers play an important and challenging role, providing efficient, safe and sanitary services. Because of their work, they are particularly vulnerable to infectious diseases acquired professionally. These workers face occupational hazards, such as, infectious agents, chemical, psychosocial, biological hazards, among others.

The study outlined is classified as transverse type, but it's still under development, and its main objective is to evaluate the occupational hazards to which mortuary workers are exposed. The methodology used in our study was a bibliographic research and a checklist to support the assisted observation study.

In conclusion, from the bibliographic research carried out, it is verified that the task in which the worker is most likely to acquire risks, is in the sanitization of the corpse, which specific procedures and techniques are implicit. The risks that are most meaningful, and require greater intervention, are biological, ergonomic and mechanical risks. Due to this reality it is necessary to implement prevention such as, training workers on ergonomics and manual handling of loads, training workers on good practice in the context of safety and health and prevention of infection, enforcement with safety standards and use of Personal Protective Equipment. In short, the implementation of the Basic Precautions of Infection Control, hand hygiene, proper use of PPE and sanitation plans are essential to minimize risk.

Keywords: Hospital mortuary, Occupational risk, Health and safety at work, Risk and control assessment

BURNOUT SINDROME: CAUSES AND CONSEQUENCES

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By Vieira et al (2006) “burnout is a condition of psychic suffering related to work. It is associated with physiological changes due to stress (increased risk of infections, hyperglycemia and increased cardiovascular risk), alcohol and substance abuse, risk of suicide and anxiety and depressive disorders, as well as socio-economic implications (absenteeism, productivity).”

Some authors identify the causes of burnout as being a combination of individual factors such as personality, motivation, and educational level; physical environment such as, security and communication; social, related with family struggles and culture, finally, work-related factors such as type of occupation, satisfaction, responsibility or overload, and this interaction would produce a perception of low professional value, resulting in burnout.

The consequences of this problem are very varied, creating effects at a professional level, affecting physical and emotional well-being, having the capacity to develop organizational-level proportions, according to ALUJA (1997) “burnout usually leads to deterioration of physical and emotional well-being. The professional affected by the syndrome feels exhausted, is often ill, suffers from insomnia, ulcers, headaches, problems related to blood pressure, muscle tension and chronic fatigue. They also affirm that there is a correlation between burnout and alcoholism, mental illness, marital conflicts and suicides.”

It is thus understood that burnout syndrome is a disease related to occupational health, in many cases not detectable until reaching greater proportions, with the probability of affecting the worker and consequently his workplace and those around him.

Keywords: Burnout; Stress; Factors; Consequences

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PREVENTION OF EXPOSURE TO BIOLOGICAL AGENTS AT WORK PLACE

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Exposure to biological agents in the workplace can occur in a multiplicity of situations and activities, implying very different agents and situations of risk and, in some cases, of great specificity.

Because these are activities where the risk of contamination of workers and the community is high, appropriate measures should be taken.

The protection of workers is based on the assessment of exposure risks, which are determined, on the one hand, by the characteristics of the agents involved in the activity and, on the other, by the adequacy of the facilities, equipment and work practices, enabling trigger and development of measures which primarily involve the control of agents harmful to the health of workers through the implementation, among other, of recommendations of the Direcção-Geral da Saúde.

Being a very diversified set of activities, this implies the development of a set of equally diversified recommendations suited to the large groups of activities.

It is intended to present some general recommendations for the protection of workers against risks related to exposure to biological agents at work.

Keywords: Recommendations; worker; exposure; microorganisms

TECHNICAL BRANCHES OF OCCUPATIONAL HYGIENE AND SAFETY OFFICER INTERVENTION

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Occupational Hygiene is the science dedicated to the recognition, evaluation and control of environmental risk factors with origin in the workplace and that can cause disease, damage to the health or well-being of workers, considering the impact on the environment. This science works in the field of Occupational Health by applying the resources of Safety and Occupational Medicine, acting directly in the prevention of occupational diseases due to environmental risks. There are four branches of occupational hygiene:

Hygiene, which is responsible for the theoretical study of contaminants and the effects on man.

Analytical hygiene, which qualitatively and quantitatively determines the contaminants in the workplace.

Operational hygiene, based on control methods and reduction of concentration levels - elimination of risk.

Hygiene in the field, oversees carrying out the study of the hygienic situation in the work environment. As well as workplace analysis, and contaminant detection.

The intervention of the Safety Officer passes by anticipate, identify and evaluate the conditions and work practices; develop methodologies, procedures and control programs; Implement, administer and report on risks and control programs; Measure, audit and evaluate the effectiveness of the measures;

Keywords: Occupational hygiene; Environmental Risks; Intervention.

EXPOSURE TO EXTREME TEMPERATURE (HOT) AND ITS IMPACT ON OCCUPATIONAL ACCIDENTS

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Certain occupational activities such as construction, quarries, agricultural and fishing activities tend to register certain symptoms as a consequence of prolonged and systemic exposure.

Generally, these symptoms may express behavioral changes and mood swings, distractibility, physical fatigue, decreased work rate, lack of motivation, decreased degree of concentration or increased absenteeism. Alongside these may appear more severe and systemic problems such as thermal shock and collapse, dehydration and demineralization, having various effects and can lead to scenarios of lack of skillness; loss of mental capacity; reduced dexterity; increasing reaction time.

It is essential to know the hot thermal environment in order to optimize the productivity and quality indices as well as those of well-being and health and safety.

The present poster intends to analyze the broad effects of extreme temperatures (hot) in different occupational scenarios through the state of the art in this field, namely its impact upon: i) health and safety conditions (occupational approach) and ii) productivity (economic approach).

The results show a consistency in the methods applied and suggest its applicability for the adoption of preventive and organizational measures.

Keywords: Occupational hygiene; Environmental Risks; Intervention; Thermal environment; Heat; Thermal index;

OCCUPATIONAL SAFETY AT RAILWAY MAINTENANCE

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The railway industry's main objective is the transport of passengers and goods in safety conditions. However, the maintenance tasks carried out on the railroad or in its proximity entails serious risks, which are caused by two main risk factors typical of the railway environment. We are referring to railroad traffic, which can lead to train hit or train run over, and overhead line traction equipment, that can cause electrocution or electrification.

These risks' magnitude requires an integration of preventive measures during planning and prior work organization, implying an adequate implementation during its execution.

The safety measures defined for this kind of work are not exclusively applied to railway workers. They are also extendable to third party interventions' wich activities may collide with the infrastructure's integrity or its safe operation.

The present poster is intended to present, in a general way, the guidelines applied in the analysis of such risks and the criteria involved in the planning and implementation of standardized prevention measures used to eliminate or reduce those risks to acceptable levels, considering, nevertheless, the need to articulate workers' safety without causing constraints to the railroad traffic.

Keywords: Railroad, Prevention, Safety, Run Over, Electrocution, Railway Maintenance

FALL OR NOT FALL? AERIAL WORKING PLATFORMS

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When it comes to working at a height, it is critical to take extra care.

In activities carried out in high places, with a height of more than two meters of the floor, the risk of fall can have serious and fatal consequences for the worker and that represent a high percentage of accidents at work.

An Aerial Work Platform saves time and makes work in high places efficient, effective and more secure than through traditional access methods. When used safely, these devices significantly reduce the risk of injury from falling.

These equipments have a workstation also called a basket or platform, with different configurations, different workload capacities, and that rise to reach a certain elevated point or place of work, leading one or more workers and their tools and / or equipments.

The operation of these equipments requires training and specific certification due to the high risk of fall in height.

It is fundamental to identify the activities to be carried out and what are the real conditions of the work environment, including the weather conditions (meteorology) among others.

Everyone is responsible for safety, the correct use of all means and available equipment is a way to ensure the prevention of accidents at work. The definition of a set of rules and indications is of great importance for those operating with Aerial Work Platforms.

Keywords: Height; safety; equipment; work; hazards

PRINCIPLES OF STORAGE AND PACKAGING OF IMMUNOBIOLOGICAL MEDICINES

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The storage and packaging of medicines is a parameter of great importance, since their own stability may compromise their effectiveness, quality and safety. Immunobiological drugs are products developed from living material like human or animal antibodies (proteins or nucleic acids) and generally used in treatment of chronic diseases.

The objective of our work is to describe the main parameters of conservation of immunobiological drugs.

Because of their specific characteristics, these drugs should be stored in refrigerators equipped with thermo-hygrometers with a temperature between 2°C and 8°C, and it should be checked and recorded three times a day, as well as humidity in that refrigerator (<60%).

The place destined to the storage of these medicines must have a power generator as alternative source in case the electricity goes down. It also needs a special attention to the ventilation, sun ray's direct incidence and it should have a first aid kit, alarm system, fire extinguisher and everything well signed. This should be guaranteed by properly qualified and equipped professionals.

These medicines are organized by alphabetical order, by pharmaceutical specialty and respecting the "first in, first out" method of validity.

The transport of these drugs must be carried out in thermal boxes or thermal suitcases with the respective accumulators of cold that won't compromise their storage conditions.

The storage and packaging of immunobiological medicinal products is crucial to ensure the maximum effect of this type of medicine when administered, therefore, all the guidelines mentioned must be respected.

Keywords: Storage, packaging, Immunobiological drugs

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ORGANIZATION OF HOSPITAL PHARMACY

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The services that form the hospital pharmacy ensure the drug therapy to the patients as well as the quality, efficacy and safety of the medicines. A hospital pharmacy is divided in several areas such as selection and acquisition, reception and storage, preparation, control, distribution, clinical pharmacy, pharmacovigilance and pharmacokinetics. The objective of the present work is to reflect on the applications and on good practices in the preparation of products such as, for example, chemotherapy, making an approach to cytotoxic preparations and parenteral nutrition. Both cytotoxic preparations and parenteral preparations are liquid forms of IV administration. In both preparation, whether it is industrial production of medicinal products or technical handling, the aseptic technic is a central requirement to ensure that a sterile product can be obtained.

For these preparations, in the hospital pharmacy there must be three distinct spaces: a controlled environment area or clean room, a work area and a storage. The manufacture of these sterile preparations must be done in clean areas, where the entrance of personnel and manufactured materials is done by antechambers. Clean areas must be kept in an agreed cleaning state and fed with properly filtered air, as described in Ordinance No. 42/92 of January 23. Operations for component preparation, product preparation, filling and sterilization are done in clean, separate areas. There is also required Validity tests of the methods that are used and environmental tests that include not only air, but also surfaces and the operator.

Although there are several areas in the hospital pharmacy, in relation to the preparation of medicine, special care must be taken, being necessary to ensure the quality, safety and sterility of the products for the dispensation to the patients.

Keywords: Hospital pharmacy, farmotech, sterile

NEW TECHNOLOGIES IN THE PHARMACY MANAGEMENT

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In the past few years technology has revolutionized many sectors of our society, especially in the health area. The advances in technological methods in this area have had a significant impact. For instance, the several automated equipment that exist in the pharmacy have been proved to be extremely important in the management of the medicines in hospitals. Thus, the objective of this work is to present a method called Fast Distribution System (FDS).

Currently, new information and communication technologies are applied to several drug distribution systems, resulting in a better economic and therapeutic management of medicines. These methodologies promote better patient safety, contributing to the reduction of errors associated with dispensing and administration, ensuring the availability of the drug when necessary, encouraging adherence to the therapy and compliance with the legal procedures that involve the medication.

Since drug distribution is a key process in the drug circuit in a hospital setting, FDS is an example of automated drug delivery equipment. The FDS is a technology that allows for easy repackaging and identification of solid oral forms (tablets and capsules) individually for a period of 24 hours and according to a unit dose prescribed for each patient, thus minimizing a set of errors associated with medication.

The use of such technologies increases effectiveness, efficiency and services provided, being essential to

Keywords: Fast Distribution System, drug distribution systems, communication technologies, automated equipment.

ECONOMIC MANAGEMENT OF DRUGS STOCKS AT HOSPITAL PHARMACY

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Stock management is a technical administrative activity that aims to help in the purchase of products, taking into account the correct maintenance of the stock levels, meeting the needs of the demand, so that there is neither excess, nor lack of articles.

However, in regard to the management of stocks in health, more specifically in the hospital pharmacy, it becomes a big challenge to predict the needs of this demand.

The main extrinsic and intrinsic factors associated with the consumption of drugs and other pharmaceuticals products depend on seasonal variations, the discontinuation of an article, an outbreak or infection, disuse or obsolete drugs, behavior changes, the pharmaceutical marketing and epidemics.

The management of stocks of drugs at hospital pharmacies, is one of the most relevant activities in the sector, due to the huge economic burden it entails, but also because it is related to the pharmacotherapeutic needs of patients. In this way, an efficient management is essential in a double perspective: not only economic but also therapeutic.

Currently, most hospital pharmacies use as technical criteria for their management of stocks, historical consumption data and/or subjective criteria. However, it is recommended to use methods sets in order to ensure accurate, efficient and credible management. It is also of great importance to use stock management methodologies, being the most important, the order point, the ABC analysis, the XYZ criticality analysis and the economic lot of purchases.

In the future, new methodologies should be investigated, such as the application of computer tools in stock management, critical analysis and evaluation of drug consumption, construction and analysis of activity indicators, etc.

Keywords: Stocks of drugs; stock management; hospital pharmacy; economic lot; new methodologies;

THE HOSPITAL PHARMACY AND THE ACQUISITION OF MEDICINES

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The Hospital Pharmacy (HP) is a specialized department, whose main purpose is to provide medicines and other health products to the hospital where it is installed. Among the others functions of HP, one of the most important is the acquisition of medicines. Therefore, this paper aims to identify the procedures performed by HP linked to the acquisition of medicines.

The acquisition of medicines for human use is made by the hospital and not directly by the pharmacy department. This requires a prior authorization by INFARMED, I.P., which establishes conditions and requirements for giving in a national authorization for the direct purchase of medicines.

The selection of the hospital drugs is based on the document National Hospital Formulary Medicines and on the therapeutic needs of the hospital patients.

For the acquisition of public assets, namely in the health sector, there is a catalog which contains all the relevant information and dates related to each of the public contests. Each contest is characterized by the annual selection of proposals from several companies providing certain services, followed by the selection of the company with the most favorable financial proposal. Therefore, the direct acquisition of medicines is carried out by manufacturers, importers or wholesale distributors, being only destined to consumption in the authorized entity.

The Hospital Pharmacy Management System supports the purchase of medicines, being the Director of the Service responsible for the acquisition of medicines, pharmaceuticals and medical devices. The documentary support of those acquisitions must be archived, during the period required by the legislation.

Therefore, the purchase of medicines is a complex system that includes several steps, in order to ensure the therapeutics measures of each hospital.

Keywords: Acquisition, Medicines, Hospital Pharmacy

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PHARMACY QUALITY: NARCOTIC AND PSYCHOTROPIC DRUGS DELIVERY RULES

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Having attention the rational management and use of the drug, the legislation promotes the prescription of medicines by International Non-Proprietary Name (INPN) and through electronic systems. In this sense, Community Pharmacies (CP) are governed by a set of rules and guidelines related to the dispensing of medicines and health products, fitting into this era of new technologies and Paper Free Recipes (PFR).

Thus, the objective of this work is to describe the quality procedures associated to the dispensation of psychotropic drugs and narcotic drugs in CP.

The prescription of this type of medication can be done in own Revenues of Psychotropic and Narcotic drugs (RPN) subject to control. It can also be a dematerialized prescription, through a line of prescription of psychotropic and narcotic subject to control (LN). There are two types of drug identification: prescription by INPN or by brand.

Data recording is done primarily by computer means by the pharmacist or pharmacy technician, with the following standards: identification of the patient or his/her representative; identification of the prescription; pharmacy identification; medicine and data.¹ Every quarter, pharmacies must file the receipts in the form of a copy by order of dispensation, where the above mentioned data must be included.

The last step of the dispensation is the prescription control, which consists of the computerized recording of the data by the pharmacy in the National Prescription Database (NPD). In case of manual prescription, the pharmacy is responsible for sending the digitalization of the prescription until the eighth day of the following month.

It is noted that the control of these drugs follows well defined and rigorous guidance standards aimed at controlling possible deviations from the illicit market, as well as the rational promotion of these same substances.

Keywords: Prescription; dispensation; psychotropic; narcotic; drugs; control

THE COST OF THE PATIENT IN HOSPITAL SETTINGS

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The costs associated to the patients in a hospital environment are a complex subject which involves the financing of the medical institutions. In Portugal, the financing of public hospitals of the National Health Service (NHS) is guaranteed by the State's Budget. The way each country defines its financing system strongly influences the behavior of the different constituents that are part of it.

The Homogeneous Diagnostic Groups (HDG), currently the system adopted in Portugal, can be defined as a unit of payment for production. These groups are identified through the consumption of resources and measured through a variable, which is the duration of the hospitalization, becoming the core matter regarding financial losses and gains. Beyond the duration of the hospitalization the aggregation of these groups is done through clinical and non-clinical attributes.

In the program contract there are stipulated goals to be achieved as well as the indicators that allow to understand the performance of these medical institutions. If the objectives are not achieved as foreseen in contract, penalties or even reductions can occur on payment.

Therefore, the structure of payments by HDG assumes particular importance since it allows hospitals to set a relation between the prices they receive and treatment costs, where its field of activity can be stimulated or constrained by the structure of the system and the associated incentives.

Keywords: Costs; financing; HDG; consumption of resources

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DRUGS DISTRIBUTION SYSTEMS IN HOSPITALS

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Drug distribution system in hospital environment is an essential process that allows the drugs availability for the users. Therefore, the hospital pharmacy, must be adapted to the hospital needs, and the systems of distribution have to consider the size and hospital structure, the distance to the user, the pathology of the patients and the human resources available. Therefore, the main purpose of this work is to present the different distribution modalities of drugs underlying their differences.

Through the drug distribution modalities in the hospitals is possible to achieve a better management of the drug use in a scientific and economic perspective, a decrease of errors associated with medication. This distribution system can be made in two global ways: the individual or collective distribution system.

The individual distribution is based on medical prescriptions specific for each patient needs, reducing wastes and costs. Moreover, reduces also the drug interactions and increase the safety of drugs.

The collective distribution (or traditional), is used to the distribution of antiseptics, disinfectant's and other materials that are needed in large amount. In this case the hospital services make the request.

All of this distribution has an associated cost due to the need of managing the hospital stock.

In conclusion, the distribution in hospitals is a complex system because the possible mistakes and medications errors and lost which result on ineffective use of the drugs. To rectify these gaps, decreasing this misuses, increasing the efficacy and safety of all the process. The previous strategies were created to improve the drug management.

Keywords: Drug Distribution; Individual Distribution; Collective Distribution

ISOFLAVONES: A PHYTOCHEMICAL AS THERAPY IN MENOPAUSAL SYMPTOMS

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Menopause is a state of life in women, characterized by a change in the hormonal state and changes in the physiological and psychosocial levels, which has a great impact on the quality of life. As an alternative to hormone replacement therapy, phytoestrogens appeared which are substances that are widely distributed by plant species and have structural similarities to estradiol. Several studies have been directed at this substance in order to realize its ability to treat various dysfunctions and diseases of menopause.

The objective of this review was to examine the evidence for phytoestrogens as an effective treatment for relieving menopausal symptoms. To do so, we analyzed different articles found on the sites: Scopus, ScienceDirect, Pubmed, B-on, Isi web of science and google academic, using the keywords phytoestrogen, isoflavone, menopause, endometrial, breast cancer, cardiovascular, hot flash, vasomotor symptoms. The search has been limited to scientific articles published since 2012.

Regarding the results, some studies indicate that phytoestrogens have the capacity to diminish the vasomotor symptoms of menopause, as well as some underlying pathologies. However, different studies on the same theme point to different results.

Thus, it is concluded that there is a controversy regarding the ability of phytoestrogens to attenuate the complications existing in the menopause as well as whether or not there are harmful effects, and therefore more research and more studies are needed to try to understand if the solution is by the use of phytoestrogens.

Keywords: Phytoestrogen, isoflavone, menopause, hot flash, vasomotor symptoms

MILK: A SOURCE OF IODINE TO BE CONSIDERED IN FOOD INTAKE IN PORTUGAL

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Iodine is an essential trace element not synthesized by the body and should be obtained from the diet. In Portugal, the average consumption of iodine is 106 µg / day, showing a deficiency of this micronutrient, since the WHO recommends 150 µg / day. These deficiencies are more pronounced in pregnant women and children. Since 92% of the Portuguese consume 177g / day of milk (higher values in children - 226g and adolescents - 220g), dairy products assume an important source of iodine, followed by the fish group. This study aims identify the possible contribution of milk to satisfy iodine nutritional needs in portuguese population.

A review study was conducted through Pubmed, Scielo and Sciencedirect, looking for available evidence on iodine and its relation with milk, prioritizing the most recent articles.

The mean iodine content in milk is 16 ± 1 µg / 100 g, however, it is possible to observe appreciable differences in the iodine content between several milk brands. Additional, it was found that infant or enriched milk does not contain more iodine than the others, and that in Portugal, the milk had a higher Iodine content in Continental Portugal than in the Açores. However, the iodine content of cow's milk is determined by the iodides available in the animal's diet (grazing or feed) and by the disinfectants used in dairy processing.

Nutritional Food and Nutritional Standards recommend 2-3 portions a day, and three servings of dairy products can suppress up to 48% of iodine DDR.

So, in spite of new studies are needed, milk seems to be a source of iodine to consider, especially if soils are modeled with a view to enriching milk with this mineral.

Keywords: Milk, Iodine, Nutritional deficiency, Food consumption

ZOO CHEMICALS INTERACTION IN PHYSICAL ACTIVITY

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Introduction: Nowadays, it has been noticed a rising interest in products that have on their constitution components with several benefits towards human health. Functional foods are a perfect example of this products, because not only they play an important role in physiological activity but also represent a basic form of nutrition to our body. There is a type of functional food denominated Zoo chemicals, which are foods of animal origin that recently have been associated with potential benefits for the human metabolism, due to their chemical properties. Some of the constituents present in zoo chemical products are conjugated linoleic acid (CLA) found in beef and lamb; fatty acids and omega-3 founded in fish oils and essential nutrients as L-carnitine, coenzyme Q10, α -lipoic acid, choline and taurine.

Aim: This study intends to identify the relationship between zoochemicals and physical performance.

Methods: It was conducted a review process, using scientific databases where we inserted terms such as: “zoo chemicals”, “physical exercise”, “mitochondrial activity” and “functional foods”. After that we selected the most relevant articles.

Results: These specific substances have a great influence on the cardiac and mitochondrial activities, being, in this way, important in the physical performance of an athlete. Research also indicates that exercise makes the body use oxygen more efficiently, increasing exercise tolerance, improving mitochondrial function along with muscle metabolism, volume and performance.

Conclusion: However, there aren't many articles yet showing the interaction between zoo chemicals and physical performance, seems to be observed a clearly positive relation among them.

Keywords: Zoo chemicals, physical exercise, mitochondrial activity and functional foods

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GARLIC: A WONDERFUL FOODSTUFF TO THE INTESTINE HEALTH

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Introduction: Prebiotics are known as non-digestible nutritional ingredients that beneficially and selectively affect a set of human colon bacteria. Colon diseases, contributes to 31,5/100000 of Portuguese deaths. Garlic is communally used in our culinary to give taste to food. However, maybe other potential effects could be obtained using it.

Aim: The purpose of this work is to know and evaluate the effects of garlic in colon diseases.

Methods: A literature review was conducted after search in several scientific databases such as Pubmed, Scielo and Science direct, using the following terms: "Prebiotics and health", "Prebiotics in colon diseases" "Prebiotics and garlic" and "Garlic as a functional food". From which various hypotheses and conclusions are drawn in order to arrive at the most probable scientific conclusion.

Results: With scientific knowledge, garlic has been studied over the years as well as the various medicinal purposes that are attributed to the various physiologically active organosulfur components. Since these garlic components have numerous physiological effects. The presence of Selenium and Vitamin C in garlic can protect colon cells from toxins by inhibiting the growth of cancer cells. In the future can be a powerful a tumor inhibitor in the colon.

Conclusion: Literature review seems to demonstrate that we will be able to say that the garlic is an important contributor in the prevention of a cluster of diseases, specially related to the colon since it can be used preventively or as treatment element.

Keywords: Prebiotics, functional food, garlic, colon diseases

SPICES POWER: THEIR NUTRITIONAL COMPOSITION AND BENEFITS

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Herbs and spices have long been associated with the human culture. Moreover, as they represent highly valued ingredients, spices have affected human activities such as exploration and trade, indirectly impacted on human history.

Spices are vegetable products or mixtures thereof, that are also esoteric food adjuncts used as flavoring and coloring agents and as preservatives for thousands of years in traditional systems of medicine because of their physiological effects beneficial to human health, such as their thermogenic effect.

A literature review (scientific articles) was conducted to determine the health benefits related to the nutritional composition and food consumption of spices.

With the knowledge of the chemistry of the spice bioactive compounds, their beneficial health effects have been investigated in recent decades. Many examples contain powerful active components that, if used correctly, can help healing the living organism and may be considered as the first ever nutraceutical.

Their multiple health beneficial include digestive stimulant action, protection to the gastrointestinal tract, hypolipidemic effect, antidiabetic influence, anti-lithogenic property, antioxidant potential, anti-inflammatory property, and cancer preventive potential. The cholesterol-lowering and antioxidant properties of specific spices have far-reaching nutraceutical implication. Antioxidant spices were also shown to greatly reduce LDL-oxidation, modulate the synthesis of prostaglandins and leukotrienes. Additional, spices consumption in the mayor meals also inhibits platelet aggregation.

Spices could be considered and recommended in eating habits attending to their potential benefits for health.

Keywords: Spices, metabolism of spices, benefits

ORGANIC MILK : A STEP-AHEAD ON ATOPIC DISEASES PREVENTION

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Introduction: Milk is considered an essential food in human development due to the presence of high biological value proteins, its good digestibility and bioavailability of its constituents, thus being an accessible protein source, rich in essential amino acids. Studies which examine the quality and safety of organic foods and investigations of the health effects of their consumption have been increasing, as well as a concern about food's allergic potential.

Objective: To carry out a scientific review on the benefits of organic milk consumption associated with the prevention of atopic diseases in children.

Methods: A literature review was conducted through research databases "PubMed", "Scielo" and "Google Scholar" using the terms "organic milk" AND "atopic diseases" OR dermatitis OR eczema AND children. More relevant articles were selected considering the title and the abstract and further on analysed.

Results: Biological milk consumption has shown significant health benefits, highlighting the crucial role in the prevention of skin allergies, human diseases and eczema in children. Studies indicate that higher amounts of pesticide residues are found in conventional pastures when compared to biological ones. These results may be associated with allergenic effects on consumers. In addition, milk from biological pastures reveals an advantageous nutritional potential in terms of fatty acids and antioxidants when compared to conventional milk.

Conclusions: In light of today's knowledge biological milk represents a benefit in the prevention of atopic diseases.

Keywords: Organic food; organic milk; allergies; atopic diseases; eczema

PROBIOTICS

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Introduction: During the last years the concept of functional food has been developed in order to describe foods containing ingredients with positive effects on host health beyond their nutritive value. They include those products that contain biologically active components that improve health, such as probiotics. To obtain a health claim for a probiotic product, food manufacturers will have to precisely define their microorganism.

Aim: The aim of this study was review the health benefits of probiotics consumption.

Methods: A literature review was conducted through research databases as “PubMed” and “Scielo” using some key words as : “probiotics”, “nutritional benefits”, “lactobacillus”, “bifidobacterium”, “microorganism”, “intestinal health.” The most important and probiotic health related articles were chosen.

Results: There is increasing evidence in favour of the claims of beneficial effects attributed to probiotics, including improvement of intestinal health; enhancement of the immune response; reduction of: serum cholesterol, lactose intolerance and the duration of rotavirus diarrheas and cancer prevention.

Conclusion: There is scientific evidence supporting the incorporation of probiotics in nutrition as a means of derivation of health benefits. This evidence seems adequate concerning the prevention and treatment of certain conditions while simply promising or even controversial when it comes to others.

Keywords: Probiotics, functional food, health benefits, intestinal health

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EGGS: A NEW FOOD STUFF TO INCORPORATE INGREDIENTS HEALTH CLAIMS ENHANCERS

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Egg is a nutritionally rich, complete, and affordable food that has several health benefits and therefore is widely consumed.

Nutritionally, it consists mostly of water, proteins and lipids and also contains several vitamins and minerals. The main egg proteins can be found in the egg white and are a good source of essential amino acids, they have antimicrobial properties and also a great impact on inflammation. On the other hand, lipids, mainly phospholipids and cholesterol, are found inside the egg yolk.

To human health, one of the major issues associated with egg consumption is related to its cholesterol content and the impact that it can have on the risk of developing cardiovascular diseases. Some studies have concluded that high egg consumption leads to the development of atherosclerosis, which increases the risk of cardiovascular diseases and diabetes. It is, however, important to note that this risk will also be influenced by other factors such as eating habits. On the other hand, some studies have not found significant effects between the intake of eggs and the highest risk of developing cardiovascular diseases. Therefore, some controversy was generated regarding the role of eggs in the development of atherosclerosis.

To combat this situation, eggs with different properties, such as low fat eggs, began to appear. So, eggs enriched in omega-3 emerged, and according to some studies this polyunsaturated fatty acid when consumed helps lower plasma cholesterol and triglyceride levels, being an added value when associated with egg consumption. The same applies to the phytosterols present in plant foods.

Keywords: Egg, Cardiovascular Disease, Cholesterol

ISOFLAVONES: CONSUME FOR A BETTER MENOPAUSE

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Introduction: Isoflavones are compounds derived from plants with a chemical structure like endogenous estrogen. During menopause the level of estrogen decrease significantly in women.

Aim: This study aims identify the use of isoflavones in the treatment of osteoporosis, cardiovascular diseases, and breast cancer and consequently the symptoms of menopause.

Methods: A literature review was conducted about this topic, using research databases.

Results: Isoflavones present themselves in relatively higher concentration in vegetables and particularly in soybeans. The content of the isoflavones in food is affected by various factors, such as the environmental and genetic conditions and processing, which is what is going to determine the concentration and the profile of isoflavones in the soybeans. The soy drink is extracted from soybeans, with a mild flavor and some additives to improve its organoleptic properties. Studies show that Japanese women, who have a soy rich diet, present lower incidence of menopause symptoms than any other women. A well-known clinical application of isoflavones concerns about menopause. Hormone replacement therapy is widely used in women with menopause, however, the use of synthetic hormones increases the risk of cardiovascular disease and breast cancer. In this sense, alternative sources of estrogen have been investigated and soybean has been highlighted due to the presence of isoflavones, which have weak estrogenic activity, which means less hormonal activity in the human body.

Conclusion: The benefits of soy to the human health, particularly for menopause women, should be a principle for the recommendation of this component of food.

Keywords: Soy beverage, isoflavones, menopause

THE IMPORTANCE OF SEAWEEDS ON THE VEGAN DIET

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Introduction: Nowadays, on a global scale, the prevalence of vegan diet has increased and associated to that, has also increased the concern about controlling the intake of all macro and micronutrients. Thus, with all of nutritional deficits present in people that adopted this lifestyle. Portugal, due to sea cost have a great potential of seaweeds production, a vegetable product that potentially could be eaten by vegan people.

Aim: This article seeks to demonstrate which nutrients may be missing and their possible introduction in this diet through a vegetable origin food.

Methods: We did a research through some databases like pub med, the American journal of clinical nutrition, science direct using keywords as: “vegan diet”, “seaweed”, “nutrients”, “iron”, “vitamin B12” and selected the articles with the most relevant information.

Results: In order to correct all the nutritional deficits that have been founded, of which iron, calcium, omega 3 and vitamin B12, seaweeds were studied, which in turn, are characterized by gathering a significant amount of all the elements in deficit. In addition, it has a great capacity of water retention which together with its large amount of soluble fiber and protein, makes seaweed an aliment of excellence in the promotion of satiety.

Conclusion: After our research we came to the conclusion that seaweed has a great part of nutrients missing on the vegan diet. So, the nutrients are iron, calcium, linolenic acid. Last but not least with this article we will discuss the bioavailability of Cobalamin in seaweed.

Keywords: “Vegan diet”, “seaweed”, “nutrients”, “iron”, “vitamin B12”

AN HANDFULL OF SEEDS A DAY, KEEPS THE DOCTOR AWAY.

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Introduction: Nowadays, seeds are getting more and more rooted on eating habits due to not only their nutritional properties but also their benefits in the organism.

Objective: The aim of this study was review the literature about the relationship between seeds nutritional composition and health.

Methods: Literature review was conducted, after search in different data base such as pubmed, scielo, science direct and google scholar, using terms “seeds OR linseed OR chia” AND “health benefits OR health OR health effects” AND “nutritional composition OR nutrition value”, considering articles after 2008. Review articles were privileged.

Results: Seeds are a good source of fiber, essential fatty acids, vitamins and minerals (calcium, iron, magnesium, phosphorus, potassium), however they are extremely high in calories supplying approximately 500 kcal for 100g of seeds. In regard to its effect on the organism, the benefits are plenty: the high content of fiber not only improves regular bowel movement but also regulates appetite and controls satiety, helping control obesity and type 2 diabetes mellitus; the balanced level of omega 3 and omega 6 fats modulates the inflammatory and immune response; phenol compounds have an antioxidant and antimicrobial activity and prevents cancer. On the other hand, excessive consumption of seeds has nefarious consequences such as an increase in bowel occlusion. Furthermore, seeds can easily be contaminated, leading to a high ingestion of toxic chemical substances.

Conclusion: Including seeds in the daily meal plan has numerous benefits as long as its consumption is made with account weight and measure.

Keywords: Seeds, health, fiber

THE INFLUENCE OF THE MEDITERRANEAN DIET IN COLORECTAL CANCER

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Colorectal cancer, one of the most frequent neoplasia in the west, mainly in developed countries, is considered the third most common cause of cancer in the world and the first in Portugal. Its incidence is increasing from year to year and it is thought that the cause for this increase is due to a gradual change of lifestyle, particularly regarding nutrition and the rise of a sedentary life.

The connection between the feeding and the risk of developing colorectal cancer has been the target of research and various studies have demonstrated the influence of the consumption of certain types of food in preventing or provoking this disease.

The mechanisms that lead to the leverage or protector effect that certain foods grant is not yet fully known. However, it is possible to know the function, either an inhibitory or accelerator, of some properties found in some of them.

According to recent studies, the Mediterranean diet, considered one of the healthiest diets in the world, has a high beneficial effect in preventing cancer, due to the low consumption of red and processed meat and high consumption of foods of vegetable origin, such as olive oil, vegetables, fruit, fresh and grain legumes.

Currently, it is estimated that approximately 30 to 40% of all tumors can be prevented through the adoption of a healthy lifestyle and that, in relation to colorectal cancer, 75% of the cases can also be avoided with the increase in the consumption of vegetable products.

Keywords: Colorectal cancer, life style, Mediterranean diet, neoplasia and health

ETHYOPATHOGENIA OF *HELICOBACTER PYLORI* IN GASTRIC ADENOCARCINOMA

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Helicobacter pylori (HP) is a Gram negative, spiraled and flagellate microorganism that can be biochemically classified as catalase, oxidase and urease positive. Its prevalence varies depending on the geographical region, age, socio-economic status, educational level, housing environment and occupation.

This microorganism has developed strategies that allow it to survive and persist in the gastric mucosa. Immune, inflammatory, humoral and cellular mechanisms triggered by the host are insufficient against HP.

HP produces a variety of virulence factors that can deregulate the intracellular signalling pathways of the host and decrease the threshold for neoplastic transformation. Between all the virulence factors, CagA (Citotoxin antigen associated), its pathogenicity Island (CagPAI) and the vacA (Vacuolating cytotoxin a) constitute the most pathogenic factors.

This bacteria is recognized as a key factor in the pathogenesis of gastritis, peptic ulcer, gastric adenocarcinoma and MALT lymphoma. It is the major cause of the pre neoplastic lesion. In many cases, it leads, to gastric adenocarcinoma of intestinal and diffuse types, characterized as being carcinogen type 1 by the International Agency for Research on Cancer.

This study allowed the understanding of the mechanism underlying the carcinogenesis of gastric adenocarcinoma when initiated by the HP infection.

Keywords: *Helicobacter pylori*; Gastric Adenocarcinoma; Virulence Factors

MICRORNAS IN THE THYROID PAPILLARY CARCINOMA

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MicroRNAs (miRNAs) are small and single-stranded non-coding RNA molecules with approximately 22 nucleotides which means they are not translated into proteins. They act as negative regulators of the protein-coding gene expression by binding to the 3'-UTR (untranslated region) of their target mRNAs that leads to the repression of protein production and by translational silencing. They are involved in processes such as cell proliferation, development and apoptosis, and their deregulation is implicated in the carcinogenesis of various human cancers. In the thyroid papillary carcinoma (PTC) miRNAs are transcriptionally up-regulated when compared with unaffected thyroid tissue. There are three principal miRNAs involved in PTC: miR-146, -221 and -222 and their expression profiles are in continuous studying so they can be used for the classification, diagnosis and prognosis of PTC.

Keywords: MicroRNAs, PTC, miRNAs, thyroid, carcinoma

THE ROLE OF APOPTOSIS AND ANGIOGENESIS IN CERVICAL CANCER

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Cervix cancer is a neoplasm that appears on the inferior portion of the uterus. This tumor is highly prevalent in female population, and it's classified as the second most common cancer among women, with around 500 000 cases and 250 000 deaths per year, worldwide. This intrauterine injury has several risk factors. Yet, the most common cause is infection by HPV (human papilloma virus).

The DNA of the virus is found in 90-100% of the cases, being the serotypes 16 and 18 the most frequent around the world. Since this virus is one of the most commonly found in the population, it's expected that most women will be exposed to it during their sex life, although most times the infection is solved. However, around 10% of the cases, the immune system can't react to the presence of the virus, leading to a persistent infection that later evolves into more serious illnesses.

The development of cervical cancer happens due to the expression of several viral oncoproteins derived from genes of high risk HPV. These proteins, by inhibiting several important key-proteins of the cell cycle, unleash a continuous proliferation of malignant cells in parallel with apoptosis blockade.

Furthermore, they trigger the expression of angiogenesis' promoting factors and block the inhibiting factors, therefore promoting tumor growth.

Nevertheless, the vaccination implemented in Portugal is extremely specific, so that it blocks these oncoproteins, showing great efficiency when administrated prior initiating sexual activity.

Keywords: Cervical cancer; HPV; apoptosis; angiogenesis

ANGIOGENESIS IN OVARIAN CANCER

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Ovarian cancer is the most lethal gynecologic malignancy. Its lethality is associated with the difficulty of early diagnosis and the failure of current treatments to eradicate the disease. Recent research has focused their investigation on the identification of biomarkers that could allow the early diagnosis and that would constitute new therapeutic targets. The knowledge of the molecular basis of this pathology, namely the apoptotic process, angiogenesis, micro-RNAs and epithelial-mesenchymal transition, is essential for a successful approach. Angiogenesis, the development of new blood vessels from existing vasculature, has a fundamental role on the pathogenicity, progression and metastization of ovarian cancer. The tumor growth and its migration ability is directly correlated with the angiogenesis process, since tumors need a continuous supply of nutrients and oxygen to its development and maintenance. Tumor angiogenesis is stimulated by the activity of pro-angiogenic factors, molecules released by the tumor, tumor stromal cells and tumor infiltrating cells, such as macrophages and platelets. Of all these substances, VEGF (Vascular Endothelial Growth Factor) has a central role in the angiogenic process in the ovarian cancer. This factor is released not only in response to different stimulation, that occur in different tumor types, but also in response to a specific mechanism in the ovarian cancer, based on the LPA (lysophosphatidic acid) pathway. Based on this knowledge, several studies have proved the value of VEGF in the diagnosis and prognosis of ovarian cancer, and more interestingly, its potential has a therapeutic target.

Keywords: Ovarian cancer, angiogenesis, VEGF

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NON-SMALL CELL LUNG CANCER: ANGIOGENESIS AND ANTIANGIOGENIC THERAPY

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Lung cancer is a major cause of death in Portugal and all around the world. Therefore, it is mandatory to understand the molecular mechanisms behind this neoplasia.

There are two main types of lung cancer, Small Cell Lung Cancer (SCLC) and Non-Small Cell Lung Cancer (NSCLC). The last group is the most frequent and includes adenocarcinomas and squamous cell carcinomas.

The main risk factor associated with lung cancer is tobacco smoking, although exposure to some chemical substances and genetic factors have also been identified as potential causing agents in NSCLC.

Like many other cancers, lung cancer is originated by the activation of oncogenes and inactivation of tumor suppressor genes due to several mutations caused by various carcinogens.

The genetic damage caused affects the normal functions of the cells such as cell proliferation, apoptosis, DNA repair and angiogenesis, thus leading to malignant cell genesis.

One of the key processes in the evolution of Non-Small Cell Lung Cancer is angiogenesis, which is the formation of new blood vessels from pre-existing vascularization. Without angiogenesis, the tumors won't have the blood supply they need to grow and metastasize.

The use of angiogenesis inhibitors that target specific angiogenic proteins and growth factors like VEGF (Vascular Endothelial Growth Factor) has been essential in developing new NSCLC treatments.

Therefore, understanding all the molecular changes involved in lung cancer is extremely important to the development of new treatments based on targeted therapy drugs that act on these specific molecular pathways.

Keywords: Lung Cancer; Angiogenesis; Targeted Therapy

HEPATOCELLULAR CARCINOMA: APOPTOTIC MECHANISMS AND THERAPEUTIC DEVELOPMENTS

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Hepatocellular carcinoma (HCC) is the sixth most common type of cancer in the world and the third with the highest number of deaths. In the last years, it was shown a valuable increase in the incidence and mortality worldwide. The prevalence rate is three times higher in the male gender and this cancer's incidence correlates with endemic areas for the virus of hepatitis B and C - Sub-Saharan Africa and Southeast Asia. Other risk factors are associated with the occurrence of HCC, such as hepatic cirrhosis, exposure to B1 aflatoxin and metabolic diseases.

It is characterized for being a solid nodular tumour with production of fibrosis and a high neovascularization. The hepatocarcinogenesis has multiple steps with abnormalities in the cellular differentiation, regeneration and proliferation. There also occurs deregulation of apoptosis and aberrant angiogenesis which culminates in a greater risk of invasion and metastization.

The apoptosis is one of the mechanisms better studied in the HCC and alterations in the expression and/or activation of p53 can be observed, as well as overactivation of the antiapoptotic paths, insensibility to death receptor ligands such as FasL or Trail, or through the TGF- β path, overexpression of Bcl-XL, Mcl-1, c-IAP1, XIAP, survivins, growth factors and expression and /or amplified activation of the JAK/STAT, PI3K/AKT and RAS/ERKs paths.

The understanding of the molecular mechanisms in CHC are of extreme importance to produce new drugs that can act in these paths and molecules, blocking and preventing the evolution of this carcinoma.

Keywords: Hepatocellular carcinoma, Apoptosis, p53

APOPTOSIS SUPPRESSION AND ANGIOGENESIS MECHANISM IN BREAST INVASIVE DUCTAL CARCINOMA

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In Europe, the incidence of breast cancer represents about 13% of all cancers, with Ductal Invasive Breast Carcinoma being the most common tumor subtype in both women and men.

In Portugal, has been a decrease in the mortality rate because of breast cancer over the years due to the prevention performed through the implemented screening program, as well as the effective treatment.

This pathology begins in the mammary duct, destroying its basement membrane and subsequent growth in surrounding adipose tissue.

In the development of this tumor are involved several biomolecular processes, such the apoptosis suppression, both in the intrinsic and extrinsic pathways, and the increase of angiogenesis.

HER2 (Type 2 Receptor of the Human Epidermoid Factor) is a trans-membrane receptor with tyrosine kinase activity, promoting cell growth through the activation of multiple signaling pathways. In about 20 to 30% of breast cancer cases, it is overexpressed. This overexpression is correlated with the increase of anti-apoptotic Bcl-2 proteins (Bcl-2, Bcl-xL and Mcl-1).

Decreased apoptosis promotes an increase of tumor cells in the breast, leading to an increased need for the supply of oxygen to nourish them. This nutritional insufficiency induces the production of VEGF (Vascular Endothelial Growth Factor), stimulating the production of new blood vessels from pre-existing ones.

The objective of this poster is to study the biomolecular basis of these two mechanisms involved in Ductal Invasive Breast Carcinoma to better understand the development of this tumor.

Keywords: Breast Invasive Ductal Carcinoma; Apoptosis; Angiogenesis

VITAMIN A

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Vitamin A is a micronutrient with antioxidant functions which include retinol, retinal, retinoic acid and several provitamin A carotenoids (most notably, beta-carotene). It is a fat-soluble vitamin which is important for general growth and development, for the maintenance of the immune system and also contributes to a healthy vision.

Vitamin A has two main sources. One of them is retinol, which has an animal origin and is a fat-soluble substance. The other one is carotenoids. They come from plants and include beta-carotene which is converted into vitamin A. Most of carotenoids have important biological properties, like lycopene (red pigment that exists in tomatoes and watermelon, for example) and lutein (yellow/orange pigment present in papaya and carrots, among others).

This micronutrient provides several health benefits, such as cell differentiation, embryonic and fetal organ development, immune functions and it is involved in the formation of structures such as teeth, bones, soft tissues, mucous membranes and skin. It is also very important because it produces pigments in the retina which contribute to an optimal vision.

This vitamin can be toxic at high or low doses. If it is ingested at higher doses than the daily recommendation (hypervitaminosis A), it can cause headache, nausea and dizziness. In extreme cases, it can lead to anorexia, hair loss and itching.

However, if there is vitamin A deficiency (hypovitaminosis A), it can lead to diarrhea, follicular hyperkeratosis (a skin condition) or xerophthalmia (a disease manifested by dry eyes and loss of vision in darkness).

Keywords: Vitamin A, retinol, carotenoids

VITAMIN C: IMPLICATIONS FOR THE PRODUCTION OF COLLAGEN

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Ascorbic acid, also known as Vitamin C, is a cofactor required for the function of several enzymes. Given that it is not synthesized in our body. It has to be provided through food, being needed for regular growth and development. It plays a critical role in the maintenance of a normal mature collagen network by preventing the auto-inactivation of two key enzymes in collagen biosynthesis. This will amplify its production, which are an essential component of connective tissue which plays a vital role in wound healing. The Vitamin C levels in the plasma and skin cells can be decreased by environmental pollutants, such as ozone, or by the smoke released from cigarettes.

Cutaneous manifestations of scurvy result from declines in collagen synthesis, leading to disruption of connective tissue and fragility of blood vessels. This depletion will impair the collagen synthesis, causing wrinkling,

thickening of the stratum corneum, subcutaneous bleeding, petechiae, ecchymoses, purpura, joint pain, poor wound healing, hyperkeratosis and corkscrew hairs.

When ascorbic acid is present in greater concentration it promotes higher bone mass and lowers fracture rates. This happens because Vitamin C suppresses osteoclasts while it also stimulates the activity of osteoblasts. Due to this balanced process, Vitamin C promotes constant bone renewal, critical in preventing fractures.

In brief, ascorbic acid is indispensable in an appropriate production of collagen that is essential to prevent skin damages, because it promotes its regeneration and maintenance. It is fundamental to consume aliments rich in Vitamin C, because the human organism doesn't produce it naturally.

Keywords: Vitamin C, collagen

ALZHEIMER'S DISEASE – CHOLINESTERASE INHIBITORS

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Alzheimer's disease is one of the most common types of dementia, it's a neurodegenerative disease known for causing a reduction in the number and size of brain cells which irreversibly deteriorates patients' cognitive functions such as memory, thought and behaviour. In most cases, symptoms begin to occur after age 60.

The presence of extracellular amyloid plaques and intraneuronal neurofibrillary made from filaments of tau protein are the main histopathological findings of the disease. The senile plaques are extracellular deposits, aggregates of the beta-amyloid peptide (A β). The neurofibrillary braids are intracellular deposits and contain the hyperphosphorylated Tau protein. There are also changes in synaptic transmission, which together contribute to memory loss and progressive impairment of cognitive abilities. This happens because the disease carriers have a reduced level of acetylcholine, a neurotransmitter found in the brain and neuromuscular junctions, which is hydrolysed by the enzyme acetylcholinesterase, destroying it. Therefore, it is necessary to inhibit acetylcholine degradation and, consequently, to increase its ability to stimulate the following neurons. Acetylcholinesterase inhibitors are used to increase the concentration of acetylcholine, leading to an increase in the communication between nerve cells, which promotes a temporary relief of symptoms and prevents the evolution of Alzheimer's disease.

Since there is no cure for Alzheimer's disease, mainly because it hasn't yet been fully understood, the treatment is designed to control the symptoms and to protect the sick people from the effects produced by the deterioration of their brains, consequence of the condition they have.

Keywords: Alzheimer; beta-amyloid peptide; acetylcholine; neurotransmitter; Acetylcholinesterase.

PARKINSON'S DISEASE – L-DOPA

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Parkinson's disease is mainly caused by a dysfunction in the basal ganglia, resulting in the degeneration of dopaminergic neurons of a specific area of the brain known as black substance, responsible for producing dopamine, which is a neurotransmitter. When degeneration of the black matter, the first zone to die, occurs a decrease in the production of dopamine that causes loss of coordination and control of the movements, affecting the muscles both during rest and when in activity. In addition, dopamine does not only interfere with motor control but also, to a lesser extent, regulates mood, motivation and intellectual concentration. The symptoms of PD only occur when about 80% of the neurons are already dead.

When dopamine's production stops, it's generally used l-dopa, a precursor which is converted into dopamine at a brain level and it is generally prescribed in association with carbidopa (Sinemet®). The dopamine doesn't go through the hemato-encephalic barrier so it can't be administrated. The L-dopa goes through that barrier and it is quickly decarboxylated by enzymes in dopamine. So the lack of dopamine is corrected, but in a non-specific way. The treatment can be made with L-dopa which is transformed in dopamine by dopa-descarboxilase enzyme. The l-dopa is combined with an inhibitor of dopa-descarboxilase to avoid peripheral effects. So, this administration improves the clinical board, but it doesn't heal the disease.

L-dopa effectiveness tends to decrease after 4 or 5 years of usage.

Keywords: l-dopa, dopamine, neurons, Parkinson, neurodegeneration

THE PINEAL GLAND

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The pineal gland is a small endocrine gland in the vertebrate brain. The shape of the gland resembles a pine cone, hence its name. The pineal gland is located in the epithalamus, near the center of the brain, between the two hemispheres.

The primary function of the pineal gland is to produce melatonin.

Melatonin has various functions in the central nervous system, the most important of them is to help to modulate sleep patterns. Melatonin production is stimulated by darkness and inhibited by light. Light sensitive nerve cells in the retina detect light and send this signal to the suprachiasmatic nucleus, synchronizing the central nervous system to the day-night cycle. Nerve fibers then relay the daylight information from the central nervous system to the paraventricular nuclei, then to the spinal cord and across the sympathetic system to superior cervical ganglia, and from there into the pineal gland.

Studies on rodents suggest that the pineal gland influences the pituitary gland's secretion of the sex hormones follicle-stimulating hormone (FSH) and luteinizing hormone (LH). Also influence the actions of recreational drugs, such as cocaine, and antidepressants, such as fluoxetine (Prozac), and that its hormone melatonin can protect against neurodegeneration.

Studies in mice suggest that melatonin regulates new bone deposition. Pineal-derived melatonin mediates its action on the bone cells through MT2 receptors. This pathway could be a potential new target for osteoporosis treatment as the study shows the curative effect of oral melatonin treatment in osteoporosis mouse model.

Keywords: Central nervous system; pineal gland; melatonin

PHYSIOLOGY OF DRUG ACTION ON CENTRAL NERVOUS SYSTEM

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Drugs are every single substance, natural or synthetic which, when ingested or otherwise, modifies its functions.

“Psychotropic drugs” are the ones which can affect our central nervous system, being able to have an impact on our way of thinking, our emotions and behaviours. These ones change the communication between neurons, which can lead to numerous effects according to the type of neurotransmitter involved and the way the drug acts. Therefore, these drugs can lead to symptoms of euphoria, anxiety, somnolence, hallucinations, etc.

All things considered, we can separate them into three major types.

Depressant drugs: reducing the mental activity. These drugs affect the brain, lowering its quickness of responding to stimulus. Consequently, our levels of attention decrease, concentration, emotional tensions and intellectual capacity also decreases. For instance, the benzodiazepines ease the GABA “communication”, a neurotransmitter responsible for the diminution of anxiety. Such as: anxiolytics, alcohol, inhalants and narcotics (heroin, morphine).

Stimulant drugs: increase the mental activity. These substances affect the brain, making it work faster. For example, the cocaine interferes with the normal functioning of the neurotransmitters. From those we can point out: the dopamine and noradrenaline.

Disturbing drugs: altering the mental perception, also known as hallucinogenic, due to the fact that they frequently cause visual illusions and affecting the five senses. For example: LSD, ecstasy, etc. These drugs cause an abnormal functioning of the central nervous system which can lead to delusions and hallucinations.

Keywords: Central nervous system, Neurotransmitters, Drugs.

MODULATORS OF PSYCHOLOGICAL DISORDERS

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Neurons are nervous cells of this system that communicate through synapses. Their main function is to guide the information through electrical signals and convert them in chemical messages called neurotransmitters. Some examples of important neurotransmitters are acetylcholine, GABA.

Modulators are chemical substances that can stimulate or inhibit the neuron receptors like the neurotransmitters. Pharmacotherapy occurs through the interaction of the receptors with neurotransmitters, the objective of this therapy is to treat psychological disorders that unbalance the neurotransmitter's message.

For this practice are used drugs that act in the modulators, examples are antidepressants, mood stabilizers and anxiolytics.

Antidepressants perform on the limbic system, they are used to treat depression or anxiety disorders. In these disorders will be deficit of neurotransmitters like noradrenaline and serotonin. The objective of these medications is to replace these substances to stabilize neuronal synapses. Mood stabilizers like lithium and Valproic-acid are related with the treatment of bipolarity. This disease is associated with the alteration of humor in the CNS and limbic system – causing periods of mania and depression. The levels of noradrenaline rise and GABA levels, the principal inhibitor of neurotransmitters, decrease. Valproic acid performs to increase the levels of GABA, by which increases the release of GABA in the body system.

Anxiolytics can be used in schizophrenia. Schizophrenia is a complex mental disorder with positive, negative and cognitive symptom domains, this disorder modify the normal function of neurotransmitter. To control the "positive" symptoms anxiolytics blocks the action of neurotransmitter – dopamine. The "negative" symptoms are controlled by blocking dopamine and serotonin neurotransmitter. This way anxiolytics contra balance the chemical disproportion created by the disorder.

Keywords: Modulators; psychological disorders; neurotransmitters;

DEGENERATIVE RETINAL DISEASES: VEGF INHIBITORS

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Both macrophages and T lymphocytes produce VEGF, substances released by damaged cells of the retina that contain all information for the development and organization of the vascular retinal network. A process called angiogenesis may occur, consisting of the formation of blood vessels from other pre-existing ones, that is, a proliferation of endothelial cells. This mechanism can occur in cases of proliferative retinopathy, rheumatoid arthritis, psoriasis, diabetes mellitus, tumor growth and metastatic dissemination, in fetal development, but in this last case doesn't acquire negative notation.

A VEGF165, a substance that is constantly present in the human eye, is responsible for photogenic neovascularization, causing the

Increased vascular permeability and sub-retinal neovascularization, and undesirable

Causes irreversible visual loss (proliferative diseases of the retina).

An AMD (age-related macular degeneration) is a type of retinal disease and to prevent it from happening so early, it has

2 antibodies to inhibit the binding of VEGF to the receptor of the eye, since this binding is more detrimental. To inhibit neovascularization, one of the forms of treatment with anti-VEGF, resulting in 4 forms: AVASTIN (Bevacizumab), MACUGEN (Pegaptanib), LUCENTIS (Ranibizumab). AVASTIN and LUCENTIS are humanized monoclonal antibodies that act against all known VEGF types, while MACUGEN is a modified lab-made oligonucleotide that only acts on VEGF165 (the main of human retina).

Keywords: VEGF, angiogenesis, AMD (age-related macular degeneration)

IF CORRENT - INHIBITORS

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The cardiac cells, pacemaker cells, auto-rhythmic cells located in the sinoatrial node are converted in biological pacemakers that control the heart rate, since they have the ability to generate an electrical signal that propagates through the electrical conduction system of the heart and triggers the contraction of the myocardium.

The depolarization of the sinoatrial node depends of the tension that occurs on phase one of depolarization of the membrane, after the voltage limit is reached, when the calcium channels open. During this process, the sodium channels, which are activated at potential levels closer to -60mV (differential basal potential), are also opened and trigger phase one of fast depolarization. During the two and three phases of depolarization, many channels are activated which means that the membrane's potential returns to the resting electrochemical gradient. On phase four occurs a slow and graduated depolarization until the threshold in which the calcium channels are reactivated, and the depolarization occurs, which means that if a auto-rhythmic cell suffers depolarization during the threshold, an action potential is formed and will spread from cell to cell through the heart in order to provide the cardiac contraction as a whole.

So that this current can function it is required the presence of channels for passage of ions in the cell membrane. There are, however, inhibitors that block the If current, for example the ivabradine. This inhibitor works when the channels are open blocking the If current, specifically in the f-channels, called: selective inhibitor of pacemaker If. Through this blocking it is decreased the rate of depolarization and consequently the heart rate.

Keywords: Auto-rhythmic cells, heart rate, inhibitors, depolarization

ENDOTHELIAL DYSFUNCTION, ATHEROSCLEROSIS AND ARTERIAL HYPERTENSION – BETA BLOCKERS

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The endothelium has the function of coating the innermost layer of the blood vessels, it is also important in the homeostasis of the vascular system, inhibiting the proliferation of smooth muscle cells and avoiding leukocyte adhesion. The endothelium produces nitric oxide that intervenes in vascular metabolism and its main functions are to avoid blood clotting, act as mediator of neurotransmitters and to act on vasodilatation of the artery. When there is a decrease in the release of nitric oxide there is a vascular relaxation which leads to vasoconstriction of the artery and in turn there is less fluidity in the blood circulation giving rise to arterial hypertension.

Endothelial dysfunction occurs when it loses its ability to produce nitric oxide, we can see this change when there is accumulation of monocytes that are in the bloodstream and enter the arterial wall and become cells that accumulate fatty substances such as cholesterol, smooth muscle cells and connective tissue cells causing a thickening (atherosclerotic plaques) in certain areas of the inner lining of the arterial wall giving rise to atherosclerosis.

In order to combat pathologies leading to endothelial dysfunction, are used beta-blockers that interfere in the functioning of the sympathetic and parasympathetic systems responsible for postganglionic neurons secreting noradrenaline and adrenaline. Beta-blockers intervene in the effects of the hormones adrenaline and noradrenaline, over the heart and other organs. When the organ is at rest beta-blockers reduce the heart rate, in a state of physical effort it limits the increase of the heart rate in order to reduce the demand of oxygen.

Keywords: Endothelial dysfunction, Endothelium, beta-blockers

RISK GROUP 3 AND 4 MICROORGANISMS - Dengue Virus

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Dengue is an infectious disease caused by a Flavivirus, transmitted by the bite of female hematophagous mosquito of the genus *Aedes* (*Aedes aegypti*), the vector.

After blood ingestion by the female *Aedes aegypti*, in the gut of mosquito occurs an infection of the epithelial cells. The intrinsic incubation period inside the mosquito is 8-12 days, after that the mosquito can infect a host. The stages of its life cycle are divided into: egg, larva, pupa and the terrestrial phase. The average life of *Aedes aegypti* is 45 days and, in this period, a mosquito can contaminate up to 300 people.

This virus, of the risk group 3, causes a febrile illness (dengue fever), which can progress to a hemorrhagic condition followed or not by shock.

After the bite of the mosquito, the virus gets incubated in the body of the host for 2-15 days. After this period, the first symptoms of the disease appears: high fever, headache, tiredness, nausea, skin spot.

The dengue vaccine Dengvaxia is able to protect against the four dengue serotypes.

There is no antiviral treatment, only a symptomatic treatment is available including the ingestion of fluids for oral hydration and the administration of paracetamol as an antipyretic.

Salicylates should not be administrated because they can cause bleeding. Non-steroidal anti-inflammatory drugs should be avoided as they increase the risk of disease progression.

The main factors that influence the spread of the disease are climate change, population density expansion and exports of goods.

Keywords: Dengue; *Aedes aegypti*; Flavivirus

RISK GROUP 3 AND 4 MICROORGANISMS: *Salmonella typhi*

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Typhoid fever is a type of infection caused by a bacteria belonging to the family Enterobacteriaceae, called *Salmonella typhi*. This bacteria belongs to class 3 risk, being gram-negative bacillus. This bacteria infects animals and humans, and in humans it's located in the gallbladder, establishing the carrier-chronic state. This type of infection can be contracted through the oral route by the consumption of contaminated products and by fecal-oral route. There are four forms of infection by this bacteria: gastritis, septicaemia, asymptomatic colonization and enteric fever, which will be the focus of this essay. After oral contamination, these bacteria adhere and proliferate in the small intestine invading the intestinal mucosa, by destroying the epithelial layer and through the intact epithelium. Bacteria remain in vacuoles where they multiply and can be transported through the cytoplasm, being released into the blood circulation. The diagnosis should be made through blood cultures, coproculture and uroculture. Treatment should be started with the choice of antibiotic according to the clinical situation of the disease and sensitivity profile. Corticosteroid therapy may be a complement to antibiotics when the medical condition worsens. It's essential to keep the patient nourished and at rest. People should be advised to wash food thoroughly, and use filtered water or even sterilized. For people traveling to endemic areas, it should be considered the vaccination as prophylactic treatment. Thus, this disease is a serious public health concern, especially in developing countries, where basic sanitary conditions aren't met and health education is precarious or non-existent.

Keywords: *Salmonella typhi*; Infection; Typhoid fever.

RISK GROUP 3 AND 4 MICROORGANISMS - Japanese Encephalitis B virus

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Japanese encephalitis is an inflammatory disease of the central nervous system caused by a virus of the Flaviviridae family. This disease is transmitted to humans by culex mosquito bites, the vector. The virus is preserved in a cycle between mosquitoes and vertebrate hosts.

This pathology is most common in Asia and the western Pacific territories, with cases reported annually between 45,000-50,000. Its incidence has been declining in Japan, the Korean peninsula and parts of China. However, the mortality rate is high, ranging between 15 and 40%.

People infected with the virus do not develop the clinical disease. Thus, the initial symptoms are fever, headache and vomiting. Later they manifest disorders at the neurological level of movement, muscular weakness and convulsions. In addition, about 30% of the cases evolve to death and 50% have a neurological sequel.

To prevent it is necessary to avoid exposure in periods of increased activity of the mosquito, cover the body so that it can't attack, use repellents and vaccination.

There is no cure for this disease, only supportive treatment. This should support the body functions to combat infection. Many who survive this disease have permanent brain damage. Thus, people living in places at highest risk for the virus should be alert to symptoms and adhere to vaccination as a prevention method to avoid mainly damage at the neurological level.

Keywords: Japanese Encephalitis B, Flaviviridae, Culex mosquito, Asia

RISKGROUPS 3 AND 4 MICROORGANISMS – Lassa virus

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Lassa fever, caused by Lassa virus, is an acute viral infectious disease that appeared in 1969 in West Africa. It results from the contact of the urine and feces of infected rodents, through respiratory, digestive, wound or even mucosal routes. This RNA virus can remain present in rodent excrement possibly for the entire lifetime.

After the infection, symptoms appear within one to three weeks, such as very high fever, cough, chest pains, vomiting and bloody diarrhea, or even meningitis.

Regarding the diagnosis, it is done through laboratory tests, such as ELISA, virus culture, immunohistochemistry and RT-PCR.

In order to prevent this disease, precautions should be taken, such as avoiding contact with potentially infected animals, cooking food well, disinfecting the dwelling. It is also important to take into account that an infected person has the virus present in their urine for up to nine weeks and in the semen for up to three months, so sexual contact of all types should be avoided during this period.

The treatment of Lassa Virus is done, mainly, with an antiviral medicine denominated 'Ribavirina', being the patient isolated.

A supportive treatment is also performed, in which maintenance of fluids, blood pressure, oxygenation and electrolyte balance takes place.

Keywords: Lassa virus; Rodents; ELISA test; Culture of the virus; Immunohistochemistry; RT-PCR; Ribavirin; Isolation.

RISK GROUP 3 AND 4 MICROORGANISMS - Leishmaniasis - *Leishmania* spp

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Leishmaniasis are a group of diseases caused by a parasite of the genus *Leishmania*, from the Trypanosomatidae family, a flagellate protozoan. There are three main forms of the disease: cutaneous, mucocutaneous and visceral (LV), being the last the one which we will focus in. The cause of LV is *Leishmania donovani* that attacks vital organs such as spleen, liver and bone marrow. In animals, symptoms as hair loss, peeling of the skin, muscle atrophy, weight loss, high fever and an increase in the volume of some organs may happen.

The cycle of transmission starts with the bite of the vector, the infected female *Phlebotomine* sandfly which needs blood for their eggs to develop, and becomes infected with the *Leishmania* parasites when they suck blood from an infected person or animal. It releases its promastigote form through eggs or saliva in a host, invades the phagocytic cells, transforms into the amastigote form, multiplies and is distributed through the reticuloendothelial system. The insect ingests it (the modification into promastigote form occurring in its gut) and will be injected into the host by the bite.

The Canine Leishmaniasis prevention focuses on using antiparasitics with repellent action and a vaccine that increases the resistance of the dog's immune system to the disease.

The diagnosis of LV involves laboratorial methodologies such as Ciemsa and cells culture in NNN medium and serological methods, such as RIFI and ELISA.

Glucantime, Milteforan and Leishguard are the main medicines used in the treatment of canine Leishmaniasis.

Keywords: Leishmaniasis; parasite; sandfly

RISK GROUP 3 AND 4 MICROORGANISMS - *Mycobacterium tuberculosis*

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Mycobacterium tuberculosis is known as “Koch’s bacillus” since it was reported by Robert Koch. It can’t be considered gram positive or negative, they’re known as acid-alcohol resistant.

It’s responsible for most of the cases of tuberculosis, affecting the lungs. When the bacteria infects the host, an immunological response is triggered which leads to the death of most of the bacillus, taking to the formation of a granuloma, going from small injuries to dead tissues. Normally, the immunological system is capable of controlling the multiplication of the bacillus, however sometimes, the bacillus outgoes the defenses of the immunological system and multiplies.

This bacteria is transmitted by cough, sneeze or expectoration, from people already infected, dispersion through the air, skin lesions or ingestion of contaminated food. People with compromised immunological system have more chances of developing the disease.

A tuberculosis’ patient presents symptoms like fever, tiredness, sweat, chest pain, weight loss, among others. For diagnosis confirmation, tests like pulmonary radiography, bronchoscopy, sputum smear microscopy, blood tests and skin tests are made.

As prevention there is a vaccine called BCG (Bacillus Calmette–Guérin). It is administrated in babies in their first month of life.

The standard treatment consists in the simultaneous use of Isoniazid, Rifampicin, Pyrazinamide e Ethambutol, with the duration of two months and in a second phase the use of Isoniazid e Rifampicin, for four months.

Portugal is one of the countries of the European Union with more notified cases. The mainly affected are men between 35 and 40 years old.

Keywords: Tuberculosis, Koch’ bacillus, lungs, BCG vaccine

RISK GROUP 3 AND 4 MICROORGANISMS - *Chlamydophila psittaci*

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Chlamydophila psittaci is a gram-negative bacterium present in the intestinal flora and skin of birds. This bacterium is a pathogen, also transmissible to humans through its contact. It causes ornithosis, epizootic outbreaks in mammals, chlamydiosis and respiratory psittacosis in humans. The Chlamydiaceae family has a unique biphasic development cycle, characterized by three distinct morphological forms: elemental body, intermediate body and reticular body.

The morbidity rate varies according to virulence. The same is true of the mortality rate. The diagnosis is clinical-epidemiological and serological, performed through complement fixation and ELISA. Confirmation of the diagnosis is achieved when there are four times higher titers between the acute phase and convalescence, obtained with an interval of two to three weeks between each collection. Diagnosis by DNA detection, through PCR with specific sequences to detect the etiological agent. The material to be collected will depend on the technique used by the laboratory of choice. Stool samples are the most commonly used. However, the bird may not be eliminating the agent at the time of harvest, favoring the occurrence of false negatives. The incubation period of this bacterium lasts about four weeks. After this period, the patient has a fever, chills, tiredness and loss of appetite.

For the prevention of this disease, it is important to know about the regulation of the importation, creation and transport of birds, among others. The treatment of choice in adults is done with doxycycline. In children, it is recommended to use erythromycin.

Keywords: *Chlamydophila psittaci*; ornithosis; chlamydiosis; respiratory psittacosis

RISK GROUP 3 AND 4 MICROORGANISMS: Yellow fever virus

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Yellow fever is an infectious disease caused by a virus and transmitted through a vector, the female mosquito *Aedes aegypti*. It is not contagious but it is endemic in the tropical forests of America and Africa. It is usually transmitted by the bite of a mosquito of the Culicidae family. In Africa it is also transmitted by ticks and by monkeys.

From an epidemiological point of view, this fever is divided into rural and urban transmission cycles, with differences in transmitters and in the place of occurrence. The susceptibility for the disease is general no matter the age group nor race, but the most affected cases are men aged between 14-35 years. The injuries are mainly located in the hepatic lobes, causing necrosis which rarely has architectural disorganization, and only in severe cases a virulence period of 5-7 days. Prevention is done with the aid of the vaccine 17D, which is recommended to be administered in healthy people with more than 6 months old and residing in endemic areas. This vaccine must be administered once after 10 years. Another way to prevent is combatting vectors by individual protection measures that can only be used in urban environment.

The definitive diagnosis of yellow fever can be done through virological methods, identification of viral antigens, viral RNA and serological methods.

Symptoms can go practically from insignificant to grave in which case can lead to lethality. There is no specific drug used in the treatment, but it is common to use analgesics and antipyretics in convenient doses.

Keywords: Yellow fever virus, *Aedes aegypti* female mosquito

RISK GROUP 3 AND 4 MICROORGANISMS - Kuru

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Kuru is the most well-known example of acquired prion disease; susceptibility to this disease is associated with homozygosity for methionine at PRNP codon 129, it is a very rare, incurable neurodegenerative disorder that was formerly common among the Fore people of Papua New Guinea.

Kuru is caused by the transmission of abnormally folded prion proteins, through infected wounds or by eating a contaminated brain, which happened in the funerary rituals of the tribes of New Guinea to maintain the life force of the deceased within the community. This leads to symptoms such as tremors, loss of coordination and neurodegeneration. When first investigated in 1957, kuru was found to be present in epidemic proportions, with approximately 1000 associated deaths in the first 5 years of observation, 1957-1961. The total number of kuru cases from 1957-2004 exceeded 2700, with more than 200 dying of the disease every year within the people of the Fore linguistic group of the Eastern Highlands of Papua New Guinea.

There is no specific test for the diagnosis of kuru, the only way is through a brain biopsy or autopsy, where a neurosurgeon removes a small piece of tissue from the patient's brain for examination and there is no known treatment for kuru. Governments and societies sought to prevent the disease in the mid-20th century by discouraging the social practice of cannibalism. Nowadays, kuru is rarely diagnosed. Symptoms similar to those of kuru more likely indicate another serious neurological disorder or spongiform disease.

Keywords: Kuru, prions, neurodegenerative disorder

Discipline:

Professor:

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