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DNA use in forensic human identification

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Aging the death: the importance of having better methods for age at death estimation of old individuals

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ABSTRACT

While trying to return the identity to human remains, the forensic anthropologist has to estimate four basic parameters: sex, age at death, ancestry, and stature. These are the so-called big four parameters of identification which altogether with the identity factors can allow a positive identification, which enables the return of the remains to the families. This presentation focusses the problematic of age estimation of older individuals which is a very relevant question since a lot of "John Doe's" are old individuals who lived alone and/or who got lost. Besides, with the increase in life expectancy, this is, more and more, a significant concern. The issue is then a different forensic perspective of aging. Until very recently, all we could do was to tell that the individual was older than 60 years when he/she died, which was not very helpful to narrow down the possibilities, since after that age, with the increasing longevity, we can have individuals dying at seventies, eighties, nineties or even centenarians. Recent research has been permitting to do some discrimination among these older age groups. However, more research about how the skeletal system ages, a paramount question, is needed. While growth and development are programmed strictly by evolution and genetics, the same does not apply to adult degeneration process. Hence, not all old individuals have old skeletons.

All the approaches to adult age estimation only produce estimates of age (age groups) with a relatively wide age range, and, the older the individuals, the wider is that age range. The perspectives and limitations of aging the older are discussed. It is clear that no single technique is able to provide an accurate estimation, the key is to use multiple methods and, above all, on how to combine them. This last issue has been profiting from the application of updated and appropriate mathematical techniques. Regarding skeletal age indicators, it is now possible to tell which should not be used. The ones to be analysed are also dictated by the state of preservation and completeness of the skeletal remains. Some of these skeletal age indicators will be commented and the contribution of genetics to this issue will also be approached.

The relevance of this subject will be illustrated through the presentation of some practical forensic cases.

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DNA use in forensic human identification

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ABSTRACT

More than 99% of the DNA code is identical for all people. The remaining percentage is of interest to forensic scientists because of the variations in the DNA that exist between individuals and that allow to identify them. The purpose of the presentation is to give an overview of the strategies developed by the forensic experts to identify criminal offenders, to resolve unestablished paternity or identify remain of unknown soldier. Examples provided by our works on forensic or historical cases will illustrate this presentation.

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Interactive technologies in stroke recovery: uncovering challenges and opportunities through physiotherapist's perspective

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ABSTRACT

Introduction: It is estimated that 55% to 75% of individuals who experience a stroke have persistent impairment of the affected upper limb (UL) [1,2]. It is needed to identify training strategies allied with interactive systems for retraining motor function of the UL. Virtual reality (VR), using either immersive or nonimmersive technology, seems to be one of those promising strategies. Virtual reality allows patients to have close-to-reality experiences, providing them varied, engaging, and realistic experiences [3]. For the physiotherapist, the use of the interactive technologies is a challenge which can improve treatment adherence, allow new environments adapted to patient needs, abilities and goals, as well as different task options [4]. The objective of this analysis was to systematically review the benefits and limitations of VR towards motor recovery of upper limb in post-stroke population.

Materials and methods: Randomised controlled trials were researched in Pubmed and PEDro databases, between January 2009 and January 2019, using the following keywords: "Virtual reality", "video games", "upper limb" and "stroke". We included articles that used immersive and nonimmersive technology in upper limb recovery after stroke, and which compared VR with others modalities We excluded all articles in which the patient received home based intervention or community rehabilitation programs. All included clinical trials had level of evidence equal or superior to 6 score, assessed by PEDro scale.

Results: Fifteen studies met the inclusion criteria. Only three studies considered immersive VR. The training of functional tasks appears to provide the greatest benefits in upper extremity function with improvements in joint range of motion, hand motor function, grip strength, and dexterity. Two studies indicated that long-term improvements persist at follow-up. None of the studies reported any significant adverse effects.

Discussion and Conclusions: There is moderate to high evidence that supports the beneficial effects of VR on stroke patient upper limb motor recovery. However, more studies are needed to determine what kind of VR systems are the most appropriate, particularly which ones may contribute or affect cortical reorganisation. It is also needed to identify the most adequate frequency, duration and intensity for the sessions.

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Might synthetic cannabinoids influence neural differentiation?

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