Taylor & Francis
Taylor & Francis Group

Annals of Medicine

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iann20

The reticular hypodermic venous system, the true integrator of the superficial venous system

J. Ovelar, J. Cédola & J. Merino

To cite this article: J. Ovelar, J. Cédola & J. Merino (2021) The reticular hypodermic venous system, the true integrator of the superficial venous system, Annals of Medicine, 53:sup1, S90-S91, DOI: 10.1080/07853890.2021.1897456

To link to this article: https://doi.org/10.1080/07853890.2021.1897456

Published online: 28 Sep 2021.

Infrasound exposure promotes development of atrial fibrosis in rats

Ana Lousinha[a], Maria João R. Oliveira[b], Gonçalo Borrecho[a], José Brito[a], Pedro Oliveira[a], Gonçalo Pereira[a], António Oliveira de Carvalho[c], Diamantino Freitas[c], Artur P. Águas[b] and Eduardo Antunes[a]

[a]Centro de Investigação Interdisciplinar Egas Moniz (CiiEM), Egas Moniz Cooperativa de Ensino Superior, Caparica, Portugal; [b]Department of Anatomy and UMIB of Abel Salazar Biomedical Sciences Institute, University of Porto, Porto, Portugal; [c]Engineering Faculty, Polo da Asprela, University of Porto, Porto, Portugal

ABSTRACT

Introduction: Recent data has shown a significant association between noise exposure and atrial fibrillation (AF) in a large cohort [1] but the pathophysiology remains unclear. The acoustic spectrum of industrial environments is particularly rich in high-intensity infrasound (IFS), which we have previously found to induce coronary perivascular fibrosis in rat hearts [2–4]. The role of atrial fibrosis in AF is well documented and remains the cornerstone of atrial pathology in patients with this arrhythmia [5]. The aim of this study was to evaluate and measure the atrial interstitial fibrosis in rats exposed to high-intensity IFS.

Material and methods: Twelve Wistar rats exposed to high-intensity IFS (110 dB, <20Hz) during a period of 6 weeks and 12 age-matched controls were studied. All the handling and care of the experimental animals was performed by authorised researchers and was done in accordance with the EU Commission on Animal Protection for Experimental and Scientific Purposes (2010/63/EU). Hearts were transversely sectioned and the atrial fragment was selected for analysis. Chromotrope-aniline blue staining was used for histological observation and the images were obtained with an optical microscope using 400× magnifications. For each atrium, three optical fields containing more prominent fibrotic development in the absence of any arterial vessel were selected. The measurement of fibrosis was performed using *Image J software*. Mann–Whitney test was used to compare the groups.

Results: The mean values of atrial interstitial fibrosis were 8.96 ± 4.08 and 4.91 ± 1.46, respectively, in IFS-exposed rats and controls. IFS-exposed rats exhibited a significant increase in atrial interstitial fibrosis ($p = .005$).

Discussion and conclusion: High-intensity IFS induces atrial interstitial fibrosis in rats. This finding reinforces the need for further experimental and clinical studies concerning the effects of IFS on the heart.

CONTACT Ana Lousinha alousinha@gmail.com

References

[1] Hahad O, Beutel M, Gori T, et al. Annoyance to different noise sources is associated with atrial fibrillation in the Gutenberg Health Study. Int J Cardiol. 2018;264:79–84.

[2] Lousinha A, Antunes E, Borrecho G, et al. Histomorphometric evaluation of the small coronary arteries in rats exposed to industrial noise. Int J Mol Sci. 2015;16:1095–1104.

[3] Lousinha A, Oliveira MJR, Borrecho G, et al. Infrasound induces coronary perivascular fibrosis in rats. Cardiovasc Pathol. 2018;37:39–44.

[4] Antunes E, Oliveira P, Oliveira MJ, et al. Histomorphometric evaluation of the coronary artery vessels in rats submitted to industrial noise. Acta Cardiol. 2013;68(3):241–245.

[5] Dzeshka MS, Lip GY, Snezhitskiy V, et al. Cardiac fibrosis in patients with atrial fibrillation: mechanisms and clinical implications. J Am Coll Cardiol. 2015;66(8):943–959.

DOI: 10.1080/07853890.2021.1897455

The reticular hypodermic venous system, the true integrator of the superficial venous system

J. Ovelar, J. Cédola and J. Merino

CIMED FUNDAMI Digital Anatomy Laboratory, La Plata, Buenos Aires, Argentina

ABSTRACT

Introduction: An anatomical observational, retrospective and cross-sectional study of the Venotomographies performed at CIMED was carried out from January 2014 to the present, with 105 studies of patients of both sexes. The study methodology was multislice computed venotomography, which allowed to achieve a live anatomical study in several

observational planes and making virtual dissections [1, 2].
The aim is demonstrating by means of virtual anatomy how the reticular hypodermic venous system (RHVS) connects the main superficial venous trunks to each other, to the perforating venous system and through them to the deep venous system.
Materials and methods: The scanner used was a 64-detector Phillips multislice tomograph and the program chosen was Phillips' IntelliSpace Portal. To determine the characteristics of RHVS, it was divided the studied population into three groups: 1- without venous pathology, 2- with venous hypertension due to obstruction or compression, 3- in varicose recurrence.
Results: The procedure used allowed to demonstrate that the RHVS produces a true integration of the entire superficial venous system, perforating venous system and through this to the deep venous system as well.
Discussion and conclusions: The MCVT has proven to be a versatile and effective method of observing the entire superficial venous system in detail [3].
The RHVS integrates both truncal venous systems, saphenous vein magna, saphenous vein parva and its main tributaries [4]. It integrates all perforating veins with the reticular venous system. And it links the superficial venous system and the perforator with the deep venous system. This conclude affirming that the entire superficial venous system is a single anatomical unit integrated by the RHVS.

CONTACT J. Merino lad.3d.lp@gmail.com@gmail.com

References

[1] Uhl JF, Verdeille S, Martin-Bouyer Y. Three-dimensional spiral CT venography for the pre-operative assessment of varicose patients. VASA. 2003;32(2):91–94.
[2] Uhl JF, Verdeille S, Martin-Bouyer Y. Pre-operative assessment of varicose patients by veno-CT with 3D reconstruction 3rd International workshop on multislice CT 3D imaging. Debatin: Springer Verlag Ed pavone; 2003.
[3] Uhl JF, Caggiati A. Three-Dimensional Evaluation of the Venous System in Varicose Limbs by Multidetector Spiral CT. In: Passriello CR, editor. Multidetector-row CT angiography. Medical radiology. Berlin: Springer; 2005. p. 199–206.
[4] Ovelar JA, Cédola J, Merino JP. Importancia de la fascia safénica en el desarrollo de la patología venosa de safena magna y de su menor porcentual patológico en su sector infrapatelar, en relación a la indicación de tratamiento láser endoluminal. Ediciones de la Universidad del salvador, Bs. As. 09-09; 2014.
[5] Park EA, Chung JW, Lee W, et al. Three-dimensional evaluation of the anatomic variations of the femoral vein and popliteal vein in relation to the accompanying artery by using CT venography. Korean J Radiol. 2011;12(3):327–340.

DOI: 10.1080/07853890.2021.1897456

Comparison of in-office and at-home tooth-whitening products cytotoxicity

Kristel Pitz[a], Susana Bandarra[a], Paulo Mascarenhas[a], Ana Clara Ribeiro[a], Ana Azul[b], Madalena Salema-Oom[a] and Isabel Barahona[a]

[a]Laboratörio de Biologia Molecular, Centro de Investigação Interdisciplinar Egas Moniz (CiiEM), Egas Moniz Cooperativa de Ensino Superior, Caparica, Portugal; [b]Laboratório de Biomateriais, Centro de Investigação Interdisciplinar Egas Moniz (CiiEM), Egas Moniz Cooperativa de Ensino Superior, Caparica, Portugal

ABSTRACT
Introduction: Bleaching teeth to have a whiter and bright smile is a popular trend and currently one can do it at home, without technical support from dentists. However, whitening products are not innocuous and the European legislation is clear limiting the content in hydrogen peroxide (H_2O_2), present or released, to 6%, still, products containing up to 40% of H_2O_2 are commercially available. In fact, the contact time of live tissues with H_2O_2 agents is usually small, which may restrict side effects, but on the other hand, successively applications as well as at-home careless applications may be harmful. This work aims to verify how whitening products commercialised in Portugal impact on fibroblasts viability.
Materials and methods: We used fibroblasts, the main cells of both pulp and gingivae that contact with whitening gels. Mouse embryo fibroblasts (NIH/3T3) were incubated with serial dilutions of Opalescence PF boost 40%, Opalescent PF 16%, Opalescent PF 10% from Ultradent (USA) and Bbryance 0.095% (France) in culture medium for 1-hour. After that period, the culture medium was removed and cell viability was determined using MTT assay.
Results: Our results showed a huge decrease in fibroblasts viability after exposure to both product types: containing H_2O_2 or carbamide peroxide. To achieve conditions considered non-toxic, i.e. showing a reduction in cell viability $<30\%$ [1], it was necessary to dilute whitening products at least 100- to 62,500-fold, down to 0.0001–0.0004% H_2O_2, as shown in Table 1.
Discussion and conclusions: Although we cannot extrapolate this effect directly to human teeth, because the concentration of H_2O_2 arriving at the pulp depends on diffusion through dentinal tubules, our observations are of great concern in