

Editor's Letter. Are Basic Science really important to clinicians?

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On my opinion the dentist, from now on, has to be an applied oral biologist. Why is that so? We have to be professionals able to transit in several areas such as computer simulation, Computer Aided Design (CAD), Computer Aided Manufacture (CAM), Robot operators, molecular biologists, cell biologists among so many others, AND master all the knowledge and technical procedures of dentistry. About digital flow we already discussed briefly in past editorials. In this editorial we will approach the molecular and cell biology, why it is so important to a dentist, from the general practitioner to the specialist.

Clinical investigations, mainly Randomized Clinical Trials are very welcome to clinicians, but what about basic science investigations? Are they really necessary? Do clinicians use the information in treatment procedures?

Much had been discussed about this. Some agree that on the basic of the basic science matter for clinicians, for instance, the knowledge of anatomy for surgery, knowledge of periodontium histology for periodontics, the basic knowledge of craniofacial growth for jaw functional orthopedists and so on. This kind of thinking worries me a lot. In my way of thinking it is a short thought, is to give up auxiliary or complementary treatment protocols that could enhance patient response. One can say that this kind of knowledge must be find in a Randomized Clinical Trial, not in basic science information, since there is no formal protocol with proven efficiency, and I cannot say she/he is wrong, but I could say that if the procedures are properly noted in the patient's clinical record you can provide data, which properly published, can promote the advancement of science or even create a doubt in one's mind that can continue or even expand this research line.

Let's talk about vertical dimension. When I graduated it was a true lord enslaving us. It could not be changed. You have to work suiting the technic and the patient to a pre-existing rest vertical dimension. The space between superior and inferior tooth, when the mandible is in its rest position with the lower electrical activity of the masticatory muscles, could not be invaded, until the basic science found out a receptor in the temporomandibular joint with the function to adapt the entire stomatognathic system to modifications in the vertical dimension. This discovery abolishes the slavery of the vertical dimension. It is true the any alteration on the occlusal vertical dimension requires detailed planning and lots of expertise to done [1], but basic science changes clinical concepts

For instance, a revision about use of mechanical vibration on bone biology [2] concluded is that high frequency and low magnitude mechanical vibration stimulates bone biology enhancing patient response to dentofacial treatments. Another revision shows that the degree of benefit varies regarding the origin of the cell, age, characteristics of the mechanical wave, and some biochemical agents, but differentiation of stem and progenitor cells promoting cell differentiations, self-renewal and proliferation is a reality for both in vivo and in vitro investigations [3]. Based on the information of both reviews use of mechanical vibration to stimulate the progenitor cells of the condyle and mandibular fossa, called by Petrovic Skeletobasts, is a very interesting procedure to enhance quality of retrognathia treatment with mandibular advancement. Petrovic revolutionized treatment of retrognathia with the findings of his team about mandibular response to chemical and mechanical stimulus [4]. Basic science changing and enhancing clinical treatment protocols.

The million dollars questions are, what is the most suitable mechanical vibration application

protocol for these treatments? Is there need for different application protocols due to age, biotype, gender? Is there need for different mechanical signals (different amplitudes of the mechanical wave regarding, speed, magnitude or frequency) according to these variables above, or many others to come? That is just an example how basic science can, at worst, make a clinician question her/his treatment protocols in order to improve them, i.e., take her/him out of the box and expand the horizons.

Generally speaking, journals focused on clinical practice publish few papers about basic science, I cannot say if it is due to not receiving this type of papers or refusing on the grounds that it is not in the interest of the journal's readers. If the last reason is why we don't have more papers on clinical practice journals, it is a mistake that have to be correct, and more attention must be paid on basic research papers. The Editorial board, in my humble opinion, should ask permission to the authors to insert one or two paragraphs to link the basic science to clinical practice to enrich more and more the knowledge and the tools a clinician has to care for our patients.

References

- [1] M. Calamita, C. Coachman, N. Sesma, and J. Kois, "Occlusal vertical dimension: treatment planning decisions and management considerations," *The International Journal of Esthetic Dentistry*, Vol. 14, No. 2, pp. 166–181, 2019.
- [2] O. Santiago, R. Huebner, and M. L. Duarte, "Effects of mechanical vibration on bone – a critical review," *Jaw Functional Orthopedics and Craniofacial Growth*, Nov. 2022, <https://doi.org/10.21595/jfocg.2022.22865>
- [3] O. Baskan, O. Karadas, G. Mese, and E. Ozcivici, "Applicability of Low-intensity Vibrations as a Regulatory Factor on Stem and Progenitor Cell Populations," *Current Stem Cell Research and Therapy*, Vol. 15, No. 5, pp. 391–399, Jul. 2020, <https://doi.org/10.2174/1574888x14666191212155647>
- [4] A. G. Petrovic and J. Stutzmann, "Further investigations into the functioning of the peripheral comparator of the servosystem (respective positions of the upper and lower dental arches) in the control of the condylar cartilage growth rate and of the lengthening of the jaw," in *The Biology of Occlusal Development. a Symposium. Monograph No. 6, Craniofacial Growth Series, Center for Human Growth*, 1977.



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