ENDODONTIC "TRENDS": WHAT DOES SCIENCE HAVE TO SAY ABOUT THEM?

The Endodontic world is often flooded with new products and protocols, generally with a strong commercial appeal, ensuring improvements in the outcomes of root canal treatment. These new techniques have often been labeled as being less invasive or more biology-reliant and have been indicated to replace scientifically and clinically supported therapies. The most recent and widely discussed examples in the endodontic scenario are the minimally invasive treatments (especially minimally invasive endodontic access cavities), the so-called "natural" disinfection therapies such as ozone therapy, and new "biological miraculous" root canal sealers.

New techniques and materials will always be welcome in Endodontics. The point is that, for these techniques to be implemented in clinical practice, there should be followed process, as in any other medical and dental specialties. In general, this assessment is made before greenlighting any new technique and/or material. It basically consists of two distinct phases: a preclinical phase; and a clinical phase.[1] The preclinical phase involves laboratory investigation regarding the safety and benefits of the new proposal. The clinical phase involves clinical trials that aim to confirm the laboratory findings in humans. If in both preclinical and clinical phase the new proposed treatment does not offer advantages over the traditional model currently used and/or presents major disadvantages, it should not be used clinically. A widely known example of methodological oversight regarding the launch of new drugs is the case of Thalidomide. This drug was launched without adequate proof of its safety for the patient's health. This medication had some teratogenic effects, the main one being phocomelia (retarded limb growth) leading to a long delay in the growth of the long bones of the arms and legs. Approximately 12 thousand children were affected in several countries.[2] Translating this to the Endodontic research, it is essential that any new therapy and/or medication be previously evaluated with extreme attention and thoroughness checking the benefits and risks in order to guarantee the well-being of the individual undergoing this therapy.

At some point, whether in the preclinical or in the clinical phase, research on the three above-mentioned examples, minimally invasive accesses cavities; ozone therapy; and bioceramic root canal sealer, failed to provide scientific evidence to support their use. Regarding minimally invasive accesses cavities, it would appear logical to assume that the fracture resistance of endodontically treated teeth would be better preserved if this access was performed, thus improving long-term prognosis.[3] However, the results so far have failed to point out the real benefits of this new access modality with regard to fracture resistance.[4] In fact, the results demonstrated series of drawbacks related to the location, cleaning, shaping disinfection and filling the root canals.[5-7] Although the research on ozone therapy might have some found promising results in laboratory experimental models, it failed to point out real clinical benefits in *in vivo* studies that would justify it being used as a substitute or as a complementary approach to the gold standard irrigation protocols used in Endodontics (NaOCl associated with EDTA).[8] Some root canal sealers, especially those claimed to have a better biological response have a strong commercial appeal – mainly due to the BIO prefix – however, did not managed to fulfill all the requirements of physico-chemical laboratory tests proposed by ISO or ADA guidelines.[9,10]

While the emergence of new trends warms the Endodontics market from time to time, Endodontic science has an obligation and responsibility to validate or refute new hypotheses and materials. In fact, the impulses of scientific thinking ask for evidence. One major problem is that many of these proposals are widely disseminated or commercialized before any type of strong scientific evidence or even without favorable results. As in general, the new trends are still lacking in scientific evidence, the take home message is clear: take a deep breath and wait for scientific evidence before modifying any clinical protocol that is currently being used with scientifically proven benefits.

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