

Guest editorial

Dental amalgam “prohibition”: what the dentist should know

Many and different nongovernmental organizations (NGOs), scientists, professors, dentists, physicians, activists and attorneys have tirelessly worked and legislated on the prohibition of amalgam as restorative dental material, whose articles and opinions contribute for encouraging the “third war” against amalgam. Most of us have read and known the literature cited by them. Unfortunately, even dental professionals and professors from Brazil and other countries have defended and supported these manifestations. The analysis, even superficially of the presented arguments, seems little commendable. For example, they have argued about the number of mercury that would evaporate from the occlusal surface of an amalgam restoration during function. Also, they have discussed concurrent increases of mercury in the blood and urine when amalgam restorations are inserted, followed by the reduction of this level when amalgam restorations are removed. Notwithstanding, after reading many of these documents and manuscripts on hazard potential of the amalgam, I concluded that none published good-faith, authentic, scientific research demonstrated some valid relationship between amalgam inside oral cavity and any systemic disease. However, even with its historical context, the amalgam unfortunately becomes more a victim of the archaic teaching, undervaluation, and dental esthetics than of the science.

The advent of an esthetic material of fast application compromised dental amalgam image, but it is wrong to say that this latter should not be used simply due to its silver, dark color or even to meet the population's demand for metal-free restorations because, in fact, dental amalgam assures excellent performance in maintaining the occlusal-functional, marginal or interfacial integrity.

The dentist should always remember that three mercury forms exist: inorganic, organic and elementary. The mercury inside amalgam is inorganic (or metallic), that is, it is poorly absorbed by the intestine, and when eventually absorbed, mostly tends to keep this state up to urine excretion; therefore, it is nontoxic. This is totally different from organic mercury, which is highly toxic and present in fishes and shellfishes from contaminated water and in some pesticides and herbicides. This is fast absorbed by the organism. On the other hand, elementary mercury results from the vapor inhalation when inorganic mercury is heated at high temperatures (work accident).

The mercury may penetrate in the organism in its elementary, inorganic, or organic form. The elementary form has high vapor pressure and is classified as a manufacturing, not environmental contaminant. Its main absorption route is the respiratory tract. Inorganic mercury is the oxidized form of elementary mercury and it is little absorbed by animals or plants. On the other hand, organic mercury is highly toxic, considered as an environmental contaminant and pollutant, and 95% are absorbed by the gastrointestinal tract.

The organism is not capable of transforming large inorganic mercury amounts from amalgam, which is toxic. The mercury amount absorbed by the organism from amalgam is very small compared with that absorbed from food [1, 2].

Recently the United Nations Environment Programme, (UNEP) concluded the discussion on an international agreement, so-called the Minamata Convention on Mercury, which aims to reduce the significant environmental impacts on health due to mercury atmospheric pollution and includes guidelines on many products containing this chemical element. Some of these products should be banned as of 2020. These include batteries, except those used in watches, mobile phones and implantable medical devices; switches and relays; soaps and cosmetics; certain types of compact fluorescent lamps; mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps; certain non-electronic medical devices, such as thermometers and sphygmomanometers. Some exceptions were approved, as follows: non-electronic measuring devices installed in large-scale equipment or those used for high precision measurement, where no suitable mercury-free alternative is available; and vaccines in which mercury is employed as preservative. Although Minamata Convention has cited dental amalgam restorations, suggesting a voluntary decrease of its use and commitment regarding to proper measurements of its application, it does not demand obligatory or prohibitive guidelines to reach these goals or banishment deadline.

According to the recent UNEP publication from 2013, the most anthropogenic (human activities) sources of mercury environmental contamination have been associated to the artisanal gold mining, coal burning in power stations to produce electricity, and the production of cement, ferrous and non-ferrous metals. The amount of vapor released by amalgam restorations to atmosphere due to burning per year at worldwide rate does not reach 1% of the total released by the other sectors accounting for pollution. Concerning to possible vapors from amalgam residues, there are no data monitored or recorded until 2013 by UNEP.

The most toxic mercury form, methylmercury or inorganic mercury, is found in water systems, which is accumulated in fishes and marine mammals consumed by humans; moreover, in this environment, nontoxic inorganic mercury and less toxic elementary mercury can be transformed into methylmercury. Most part of the human exposure to health risks occur due to the food consumption of foods such as marine and/or freshwater fishes.

According to Leinfelder [3], dental amalgam will be available for dentists for many years. Readily admitted or not, dental amalgam has served exceptionally to dental demands of the population for many years because of its forgiving nature. Although a good number of dentists is capable of using resin composite as amalgam substitute, this figure is far from 100%. For those not believing in this fact, they should question the endodontists who have observed the inappropriate use of resin composites accounting for an increasing of endodontic demands. The number of restoration replacements associated to secondary caries undoubtedly will continue to occur at an alarming rate until the dentists reach the competence required for using resin composite. Considering that rubber dam is recommended for the insertion or condensation of amalgam, its use is obligatory for resin composites; notwithstanding, many dentists have not employed it, regardless of the material to be inserted, condensed, or cemented [3].

Think about it. If amalgam is banned as restorative material, in each and every moment, dental profession will experience severe problems, mainly in poorer, underdeveloped or emerging countries. Thus, despite all its detectable failures and defects, our old friend amalgam will be with us for a long time, since we manage responsibly its use and discard.

In conclusion, in the name of modernity, one cannot enable that words and studies far from scientific evidences but closer from market interests, NOGs or political organizations give the final verdict on a dental material, unless international organizations (ADA, FDA, FDI), Brazilian official dental organizations (CFO and CROs), Brazilian dental organizations (ABO and ABCD) and Brazilian scientific organizations (ABENO, GBMD and GBPD) accounting for the qualification and teaching of dental products demonstrated which should be used, taught and discarded. Until now, with all due prudence and within the knowledge and relevant studies, we can continue to use dental amalgam without the fear on a possible hazard effect of one of its components – the mercury. Therefore, with all due prudence, common sense and within the knowledge and relevant studies, we can continue to teach and use dental amalgam in cases which esthetics is not mandatory, without fearing a possible systemic side effect.

References

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José Mondelli

Senior Full Professor of the Department of Operative Dentistry,
Endodontics and Dental Materials of School of Dentistry of Bauru,
University of São Paulo, Bauru, SP, Brazil