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Letters

Linking mercury amalgam to autoimmunity

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In their interesting and timely review article on mercury as a trigger of autoimmunity, published in the October 2009 issue of *Trends in Immunology* [1], Schiraldi and Monestier state that “The lack of any disease manifestations in the vast majority of individuals with mercury-containing amalgam argues strongly in favor of its continued use...” and, consequently, they state at the end of the paragraph that “...there is currently not enough systematic evidence to support the recommendation of amalgam removal in patients with autoimmune disease” [1]. Their otherwise excellent review did not consider one important factor that is related to prolonged exposure to mercury derived from dental amalgam, namely lichenoid contact stomatitis. Also known as oral lichen planus or oral lichenoid lesion, lichenoid contact stomatitis [2] is a mucositis, possibly autoimmune in origin, leading to visible oral lesions inside the mouth [3]. Mercury-containing dental amalgam has long been implicated in the pathogenesis of lichenoid contact stomatitis, with the precise role of inducing a contact delayed-type hypersensitivity reaction and promoting allergic events in susceptible individuals [2,4]. In persons exposed to dental amalgam, mercury is constantly emitted from amalgam surfaces mainly as elemental mercury vapor (Hg⁰), and its release increases markedly during mastication due to wear-abrasion [4,5]. Notably, mercury amalgam is recognized as the most important source of inorganic mercury exposure in the general population [4].

Over time, oral mucosa exposed to mercury amalgam can accumulate both inorganic mercury derived directly from the amalgam and organic mercury as a by-product of bacterial transformation of the inorganic mercury dissolved in saliva [4,6]. The effects of mercury leakage from amalgams on the immunological status of oral mucosa in persons with oral lichenoid lesions were clarified in a recent study showing the stimulation of leucocytes, as well as epithelial keratinocytes, and their production of proinflammatory mediators (e.g. elevated ICAM-1 and RANTES/CCL5) [7]. In fact, both inorganic and organic forms of mercury are well known to be sensitizing allergens [2,6]. These results are consistent with the results of experiments in animals and observational studies in humans [8,9], and a number of retrospective case series have substantiated this link [5].

Thus, several authors suggest that allergic contact stomatitis is a key factor for the pathogenesis of lichenoid contact stomatitis, primarily in lesions with a topographical relationship with amalgams [2,5,6]. Treatment of lichenoid contact stomatitis associated with mercury amalgam often requires the removal of dental amalgam, this being the most effective treatment [2,6,8]. In this regard, it has been reported that significant clinical benefit in oral lichenoid reactions can be seen in patients who were treated by dental amalgam removal. The rate of response to replacement of mercury-containing amalgam restorations among adult individuals with oral lichenoid lesions is very high, accounting for 97% of cases [8].

Likewise, a careful review of the literature suggests that amalgam removal and replacement with a non-mercury alternative is associated with a high rate of complete remission in patients with amalgam-related lichenoid lesions [2,5]. Similarly, there is evidence to suggest that lichenoid contact stomatitis may arise from amalgam tattooing in the oral mucosa. Its appearance is consistent with the presence of amalgam metals, as the amalgam tattoo is a blue-gray macula resulting from the implantation of amalgam particles into gingival mucosa during dental procedures, and it contains large amounts of mercury [10]. The co-localization of lichenoid inflammatory lesions with amalgam-based tattoos reinforces the importance of investigating mercury as a causal factor in oral lichenoid stomatitis. Parallels also exist between mercury amalgams and the skin disorder lichen planus. Mercury emitted from dental amalgam tooth fillings might play a role in eliciting the cutaneous form of lichen planus – an inflammatory autoimmune skin disease – even in the absence of oral mucosal involvement [4,11,12]. In conclusion, on the basis of the available evidence, we would like to suggest that chronic, long-standing exposure to mercury may be causative of lichenoid contact stomatitis, and amalgam-removal treatment may induce a rapid clinical response and remission in patients exposed to mercury amalgam.

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