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Cholesterol drugs may improve periodontal disease

A review of findings

Submitted by Kaethe Callan, Pre-dental student

Statins are the group of lipid-lowering drugs commonly used to control cardiovascular and cerebrovascular diseases. Statins have potential anti-inflammatory effects by blocking the intermediate metabolites of the mevalonate pathway [1]. Because periodontitis is a multifactorial chronic inflammatory disease characterized by destruction of tooth-supporting tissues, the progression of periodontal destruction involves complex interaction between periodontal bacteria and cells of the immune system [2]. This complex cytokine network mediates the immune response, and includes proinflammatory cytokines, anti-inflammatory cytokines, and specific cytokine receptors [3]. Cytokines play an important role in the initiation, progression, and the host modulation of periodontal disease [4]. The effectiveness of statin medications is based on their capacity to reduce serum cholesterol levels, primarily low-density lipoprotein (LDL) cholesterol, as statins inhibit HMG-CoA reductase and decrease the production of mevalonate, geranyl pyrophosphate, and farnesyl phosphate, and subsequent products on the way to the production of the cholesterol molecule [5]. Statins also have shown to have an anti-inflammatory effect [6].

In one study, thirty patients between 40 and 60 years of age were grouped into two: Group I consisted of subjects with generalized chronic periodontitis and on statin medication and Group II consisted of subjects with generalized chronic

periodontitis but who were not on statin medication. All patients' GCF samples were analyzed for IL-1 β , an indicator of inflammation, using commercially available enzyme-linked immunosorbent assay (ELISA). In this study, the mean GCF IL-1 β levels were lower in chronic periodontitis patients on statin medication than patients not on statin medication [1]. Another study that evaluated the effects of statins looked at GCF levels of other markers, including IL-1 β , as well as IL-10 and myeloperoxidase (MPO) in periodontal disease [7]. MPO is released by neutrophils, providing defense against pathogens [8].

Additionally, MPO levels have been shown to be elevated in inflammatory periodontal sites [9]. IL-10 is an anti-inflammatory cytokine, which can suppress monocytic cytokines including IL-1, tumor necrosis factor, and IL-6 [10, 11]. Further, IL-10 can inhibit matrix metalloproteinase (MMP) production while stimulating macrophages to produce MMP inhibitors [12]. IL-1 β and MPO levels were found to diminish, while IL-10 levels increased in patients using statin medication [7].

Yet a review of articles between 2004-2014 evaluated whether oral statin therapy could improve periodontal clinical and radiographic parameters. They found similar results, showing lower alveolar bone loss and reduction of clinical signs of inflammation. The authors stated that further studies are needed to evaluate the clinical applicability of statins in the routine treatment of chronic periodontitis [13].



Notably, however, a more long-term review was evaluated, studying 169,381 statin-using patients from the Korean National Health database (2002-2015). The occurrence of chronic periodontitis was actually significantly higher in patients who had long term use (between 1-5 years or greater than 5 years) than with short-term use (less than 1 year). While most previous studies focused on the relatively short-term effects of statins on the inflammatory parameters of pre-existing periodontitis, this study concluded that longer-term statin users had low rates of pre-existing periodontitis but high rates of newly occurring periodontitis. This indicates the necessity for careful prescribing of statins, especially for long-term use, in patients at high risk for developing periodontitis [14].

Recently, statin treatment applied locally into tissues during both surgical and nonsurgical procedures exhibiting a positive effect on various parameters of periodontal tissue health. When looking at this novel, not yet commonly utilized approach to the local application of statins as an adjunct to periodontal treatment, early studies have shown significant improvement in clinical parameters, such as probing depth

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ADA SmileCon® New Orleans needs Hospitality Volunteers

Dr. Glenn C. Dubroc, Jr., Local Arrangements Chair

ADA's SmileCon® will be in New Orleans from October 17 – 19, 2024. The local arrangements committee is seeking volunteers to serve as directional guides throughout the Morial Convention Center. Dentists, hygienists, staff, and dental students are eligible to serve as hospitality volunteers, who will be stationed throughout the convention center to welcome SmileCon® attendees, answer questions, and provide directions. Three-hour shifts are available on Thursday and Friday of the convention and some two-hour shifts are available for Saturday. Volunteers must be comfortable standing in one location for their full shift.

Confirmed hospitality volunteers will be eligible for a complimentary Dental Central Pass registration (estimated value of \$199). They will also receive a SmileCon® t-shirt and

complimentary meal vouchers (for use inside the Dental Central exhibit hall) and parking for the day of their assignment. You may volunteer for more than one shift. If desired, the value of the Dental Central Pass may be applied toward an upgrade to a Smile Pass or Platinum Smile Pass registration.

HOW TO REGISTER

Registration is open now and can be accessed at smilecon.org. Please read these instructions carefully to ensure you receive the hospitality volunteer discount on your registration pass.

REGISTRATION STEPS:

When you reach the Profile page of your registration, you will enter the Promotional Code HOS2024 and select Apply Code. Please note that this will not alter the fee displayed on the Registration Pass Selection

page; however, the discount will be applied in your cart when you reach the payment section.

Once the HOS2024 promotional code is applied, the Volunteer Assignment section of registration will be available to you. You may then pick the day, time slot, and location of your choice for your hospitality volunteer assignment. You may select more than one time slot if you are available to serve more than one shift.

At the Registration Pass Selection page, select your preferred pass (Dental Central Pass, Smile Pass, or Platinum Smile Pass). If you choose to upgrade your pass to Smile Pass or Platinum Smile Pass, you will receive a discount equal to the current value of the Dental Central Pass. Again, the discount will NOT show until you reach the payment section of your registration.

You will then complete the remainder of your registration. If you have any questions, please contact Dr. Glenn Dubroc at ituth@aol.com.

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and clinical attachment levels [15]. Another article, also emphasizing the potential of statins in surgical periodontal treatment, concluded that the local application of statins in surgery showed significant improvements in probing depth and clinical attachment levels [16]. One study evaluated 28 articles and found that the use of local application of statins as adjuvants to scaling and root planing in non-surgical periodontal treatment may be supported by the collective evidence within the limitations of the study [17]. This method of local statin delivery into the tissue shows

promise, and should be explored by further research.

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