## Dear Editor-in-Chief:

This letter seeks to clarify an issue discussed in the recent systematic review entitled, "Should Occlusal Splints Be a Routine Prescription for Diagnosed Bruxers Undergoing Implant Therapy," by Mesko ME, Almeida RC, Porto JA, Koller CD, da Rosa WL, Boscato N (Int J Prosthodont 2014;27:201–203). I would like to congratulate my colleagues for addressing this topic and agree with their statement that more and better studies on the relationship between implant failures and bruxism are needed. I also endorse their conclusion that occlusal splints should not be routinely prescribed for all patients who have implant-supported prostheses while pointing out that similar conclusions are reported in a previous topic review.<sup>1</sup>

My concern is that the IJP review is restricted to limited information from only prospective and retrospective clinical trials. They did not analyze other research designs such as case-control/cohort (retrospective) as well as cohort/follow-up (prospective) studies. When randomized controlled trials (RCTs) are available, they should of course be prioritized, since they provide better control for (albeit not eliminate) bias and the placebo effect when compared to other research designs.<sup>2</sup> Since RCTs are not available—as correctly verified in the review—other research designs should have been analyzed and the best available studies selected. Clinically relevant conclusions should be based on best available evidence from all study designs and not only from RCT studies.

Recent reviews that analyzed studies other than RCTs provide similar, as well as somewhat different, conclusions. In a recent systematic review that primarily analyzed follow-up designs, a total of 21 papers were included. They were split into those assessing biological complications (ie, implant failure, implant mobility, and marginal bone loss) and those reporting mechanical complications (ie, complications or failure in implant prefabricated components or laboratory-fabricated suprastructures). The results showed that 8 out of 14 studies reported implant fail- ures, while 4 out of 7 reported mechanical complica- tions due to bruxism. However, most reviewed studies had problems in bruxism case definition (single-item assessment) and statistical problems, and positive conclusions could not be drawn from them.<sup>3</sup> Another critical review concluded that bruxism may be included among the risk factors for increased mechanical and/or technical complications in prosthodontic rehabilitation, although it seems not to affect implant survival; and that efforts (eg, splint therapy) should be made in bruxers to avoid heavy occlusal loading on all the components that contribute to prosthetic structural integrity and that may indicate earlier failure than is the norm.<sup>4</sup> A recent report by the Committee on Research in Fixed Prosthodontics of the Academy of Fixed Prosthodontics also concluded that bruxism is not an absolute contraindication for implant placement, but due to the excessive occlusal forces in patients with parafunctional habits, many authors recommend force mitigation via patient education about habits, placing an increased number of implants, placing larger implants, planning the placement of implants to reduce bending overload, avoiding the use of cantilevers, using bruxism appliance therapy, increasing time intervals during the prosthetic restoration stages to provide more opportunity for progressive loading techniques, paying diligent attention to occlusal contact design, and using acrylic resin teeth in the prosthesis.<sup>5</sup>

Regardless of study design, the scarcity of reliable studies on bruxism might also be a result of the problem in bruxism diagnosis, particularly in sleep bruxism (SB). The SB diagnosis gold standard is polysomnography (PSN), which is time consuming, costly, and performed in a different setting than the patient is used to sleeping in (ie, sleep laboratory).<sup>6</sup> In addition, monitoring is difficult because bruxism fluctuates over time.<sup>7</sup> Portable electromyography (EMG) appliances do not need a sleep laboratory and have a lower cost, but they are not as reliable as a PSN, considering that they do not differentiate bruxism-related muscle contractions from other oral motor activities, resulting in false positives, and they can only be used as screening devices.<sup>8,9</sup> A novel portable appliance measuring combined surface EMG and heart rate (HR), based on the fact that an SB event is preceded by a sudden shift in autonomic cardiac activity, has been developed and validated with promising results.<sup>10</sup> Correlation between a self-reported questionnaire versus a history-taking plus clinical examination bruxism diagnosis had the highest  $\Phi$  values for sleep grinding referral by bed partner and awake clenching, and the lowest for sleep grinding and clenching, demonstrating the limited value of clinical methods in determining a "probable" versus "possible" presence of bruxism during sleep-time activities.<sup>11</sup>

It therefore appears that sleep/awake bruxism has not been shown to increase the risk of biological complications in implants, but it may increase the risk of mechanical complications. The assessment of sleep/

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awake bruxism with clinical methods—preferably with validated methods for SB ie, PSN or validated portable EMG appliances—is a serious consideration since most patients are often unaware of its presence. The use of an occlusal splint will not guarantee the success of the prosthodontic treatment in such patients. It will, however, prevent untoward teeth wear, restorative materials, and implant components. It may also serve as an adjunct in providing pain relief when a TMD is also present.

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