Should Occlusal Splints Be a Routine Prescription for Diagnosed Bruxers Undergoing Implant Therapy?

Despite the documented excellent clinical performance of dental implants, concerns linger regarding the best way to protect the restored dentition in patients with bruxism. This is because of the risk of occlusal overload that is reported to cause biological and biomechanical failures in the implant-prosthesis system.[1,2] To better distribute occlusal loads to the rigid components of the prosthesis and to the interface between bone and implant during parafunctional movements, several dentists prescribe acrylic resin occlusal splints for nocturnal use by patients considered at risk.[2] However, it is unclear whether this recommendation is based on scientific evidence or expert clinical opinion.

This report reflects our effort to employ the systematic review protocol to assess whether there is scientific evidence to recommend an occlusal splint in bruxers after implant therapy.

Materials and Methods

Our review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[3] Two independent reviewers carried out a literature search in July 2013. Seven databases were screened: MedLine (PubMed), Lilacs, Ibecs, Web of Science, Scopus, Scielo, and The Cochrane Library (Table 1). After the searches, the duplicates were removed and the papers were evaluated.

All the titles and abstracts found were read and selected per our eligibility criteria. Inclusion criteria were:

- Studies that evaluated wearing acrylic resin occlusal splints
- Patients with bruxism and dental implant–supported prostheses
- Prospective or retrospective clinical trials

Table 1 Search Strategy

Search	Query	Items found
#5	Search #1 AND #2 AND #3 AND #4	6
#4	Search Retrospective Studies OR Studies, Retrospective OR Study, Retrospective OR Retrospective Study OR Prospective Studies OR Prospective Study OR Studies, Prospective OR Study, Prospective OR Clinical Trial OR (clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials[MeSH Terms] OR clinical trial[Publication Type] OR random*[Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading]) OR (randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract]))	4,588,766
#3	Search "Occlusal Splints" [MeSH] OR Occusal Splints OR Splints, Occlusal OR Occlusal Splint OR Splint, Occlusal OR Interocclusal appliance OR Interocclusal Splint OR Splint Therapy OR Acrylic Splint	10,542
#2	Search "Bruxism" [MeSH] OR Bruxism OR Teeth Grinding Disorder OR Disorder, Teeth Grinding OR Disorders, Teeth Grinding OR Grinding Disorder, Teeth OR Grinding Disorders, Teeth OR Teeth Grinding Disorders OR Sleep Bruxism OR Bruxism, Sleep OR Bruxisms, Sleep OR Sleep Bruxisms OR Nocturnal Teeth Grinding Disorder OR Teeth Grinding Disorder, Nocturnal OR Bruxism, Nocturnal OR Bruxisms, Nocturnal OR Nocturnal Bruxism OR Nocturnal Bruxisms OR Sleep Bruxism, Childhood OR Childhood Sleep Bruxism OR Childhood Sleep Bruxisms OR Sleep Bruxisms, Childhood OR Sleep-Related Bruxism OR Bruxism, Sleep-Related OR Bruxisms, Sleep-Related OR Sleep Related Bruxism OR Sleep-Related Bruxisms OR Sleep Bruxism, Adult OR Adult Sleep Bruxism OR Adult Sleep Bruxisms OR Sleep Bruxisms, Adult	2,720
#1	Search Dental Prosthesis, Implant-Supported [MeSH] OR Dental Prosthesis, Implant-Supported OR Dental Prosthesis, Implant Supported OR Implant-Supported Dental Prosthesis OR Dental Prostheses, Implant-Supported OR Implant Supported Dental Prosthesis OR Implant-Supported Dental Prostheses OR Prostheses, Implant-Supported Dental OR Prosthesis, Implant-Supported Dental OR Denture, Implant-Supported OR Denture, Implant Supported OR Implant-Supported Denture OR Dentures, Implant-Supported OR Implant Supported Denture OR Implant-Supported Dentures OR Prosthesis Dental, Implant-Supported OR Dental, Implant-Supported Prosthesis OR Dentals, Implant-Supported Prosthesis OR Implant-Supported Prosthesis Dental OR Implant-Supported Prosthesis Dentals OR Prosthesis Dental, Implant Supported OR Prosthesis Dentals, Implant-Supported OR Dental Implants [MeSH] OR Dental Implants OR Implants, Dental OR Dental Implant OR Implant, Dental OR Dental Implantation OR Dental Prosthesis Implantation OR Prosthesis Implantation, Dental OR Implantation, Dental OR Implantation, Dental Prosthesis OR Dental Prosthesis Implantations OR Implantations, Dental Prosthesis OR Prosthesis Implantations, Dental OR Denture, Overlay OR Dentures, Overlay OR Overlay Denture OR Overlay Dentures OR Overdenture OR Overdentures OR Fixed implant-supported partial denture OR Fixed Implant-supported complete denture OR All-on-four OR Implant-supported fixed dental prostheses	32,679

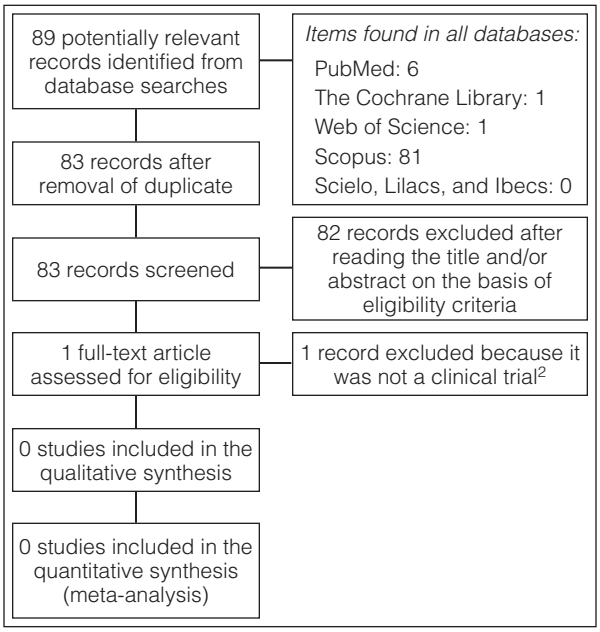

Fig 1 Search flowchart according to the PRISMA statement.[3]

Exclusion criteria were:

- Studies in patients with dental prostheses who had not received implants
- Review papers, expert opinions, case reports (or series of case reports)
- Studies published in a language other than English, Portuguese, or Spanish

The articles that met the inclusion criteria, or the articles with insufficient data in the title and abstract to make a clear decision, were selected for full analysis. Any disagreements were resolved through consensus or by a third reviewer. No eligible trials were identified because the identified papers were literature reviews, case reports (especially in dentate patients), or randomized and nonrandomized clinical trials with bruxers who did not have implant-supported dental prostheses.

Results

Eighty-nine potentially relevant records from all of the databases were retrieved (Fig 1). None of the studies matched the inclusion criteria for this review. We were unable to identify a single clinical trial that compared the use or omission of an occlusal splint in patients with implant-supported prostheses.

Discussion

The use of an occlusal splint has been suggested to reduce and modulate muscle hyperactivity, protect teeth and their supporting structures, provide muscular comfort, and decrease occlusal wear.[2] Some studies have shown that occlusal splints do not reduce masticator muscle activity over medium-term follow-up. One in vitro study evaluated the use of occlusal splints in dental implants and concluded that the interposition of these devices caused a reduction in the tension that resulted from simulating occlusal overload.[2] We found the literature regarding the influence of an occlusal device in bruxers with implant-supported prostheses to be scarce. There are no scientific, evidence-based, well-designed, randomized controlled clinical trials that establish a relationship between implant failure in bruxers and not wearing an occlusal splint.[4] In fact, the evidence for recommending these occlusal devices is only found in studies based on dentate patients, which could not be included in this review because they were not conducted in bruxers with implant-supported dental prostheses.

The recommendation to use occlusal splints to protect the implant-supported rehabilitation in bruxers is supported by a case report and expert opinions.[1,4] Lobbezoo et al recommended the nighttime use of a hard occlusal splint in patients with bruxing habits to minimize the occlusal overload and avoid biological and biomechanical complications.[5] This rationale can induce clinicians to recommend these occlusal devices in bruxers to avoid potential but uncertain complications. However, this recommendation could represent an overtreatment. It is important to establish the type of failure that occurs in prostheses of patients with bruxism compared with control groups in well-designed studies. Since failures can occur in the selected restorative material due to ceramic chipping, the abutment's screw-in framework components, or bone loss around the implant, it is uncertain whether the use of a splint can really lead to protection. Future research using high-quality clinical trial designs is recommended to specifically address the possible relationship between bruxism and dental implant failure because there is no scientific evidence that demonstrates any benefit of occlusal splints in bruxers after rehabilitation with implant-supported dental prostheses.

Conclusion

The absence of evidence-based studies to recommend occlusal splints in bruxers who have received implant-supported rehabilitation emphasizes the need for well-designed randomized controlled clinical trials.

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