INTRODUCTION AND OBJECTIVE

Bruxism is defined as a repetitive activity of the masticatory muscles, involving teeth grinding, clenching or contraction of the muscles without dental contacts [1]. This activity has harmful consequences for teeth, periodontal structures, muscles and skeletal structures. It is thought that bruxism may cause occlusal overload in rehabilitations with implants, which may lead to implant fracture or bone loss resulting in implant failure. Thus, bruxism is considered by many, a risk factor that reduces implant’s rate of success [2].

The aim of this review is to evaluate the existence of a relationship between bruxism and the risk of implant failure, by fracture or loss of osseointegration. The PICO question was defined as: "Does implant placement in patients with bruxism represents a higher risk of implant failure (loss of osseointegration or implant fracture), in comparison with patients without bruxism?"

MATERIALS AND METHODS

An electronic search was conducted in November of the year with the keywords "bruxism OR clenching" AND "implant fracture OR implant failure OR implant survival OR implant mechanical complications" on the databases PubMed, Cochrane Database of Reviews, Cochrane CENTRAL e ADA-Center for Evidence-based Dentistry, without restrictions of time and including articles in english, portuguese and spanish.

The results were selected based on title and abstract, according to inclusion and exclusion criteria previously defined: meta-analysis, systematic reviews, randomized clinical trials, prospective and retrospective studies (case series with more than 10 patients). In vitro studies or with animals were excluded. There wasn’t any limitation regarding the population or follow-up of studies. For this review, failure was defined as the need of removing the implant due to loss of osseointegration or implant fracture.

RESULTS

Study | Study design | Population (N) | Diagnosis of bruxism | Follow up | Risk of loss of osseointegration | Risk of implant fracture | Conclusions | Risk of implant failure
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Yadav et al. 2016 [2] | Retrospective | 1100 patients (610 - 490) half were diagnosed with bruxism | Clinical records and dental photos. In some patients a clinical examination was done (questionnaires (international followed). | NS | Odds Ratio (OR) 2.43 in patients with bruxism (P=0.002) | NS | The success rate of implants is widely affected by bruxism. | POSITIVE
Chrocnovic et al. 2016 [2] | Retrospective | 594 patients – 56 with bruxism and 538 without bruxism. 3469 implants | Classification followed a scale of severity. Clinical records, questionnaires and clinical observations when possible. | NS | Rate of failure 15% in patients with bruxism vs 4.6% (P<0.001) Hazard ratio 3.356 | NS | Bruxism may increase the risk of implant failure. | UNCLEAR
Chrocnovic et al. 2016 [2] | Comparative | 2670 patients (1434 / 1236) initially: 98 patients with bruxism vs 198 matched group - 427 implants in each group | Classification followed a scale according to evidence. Clinical records, questionnaires and clinical observations when possible. | Average of 2916 days for patients with bruxism vs 2672 days for those without bruxism | OR 2.71 for patients with bruxism. Higher failure rate in short and narrow implants OR 2.71 for patients with bruxism. | 16 fractured implants in patients with bruxism vs 0 in patients without bruxism. | Bruxism may increase the risk of implant failure and mechanical complications, despite the fact that other factors may influenced the results. | UNCLEAR
Chrocnovic et al. 2015 [2] | Systematic review and meta-analysis (10 studies) | Group A: 1786 prostheses, 505 in patients with bruxism. Group B 445 patients – 81 with bruxism | Classification followed a scale according to evidence. Clinical records, questionnaires and clinical observations when possible. | Average of 1-10 years | Odds ratio 4.9 in group A vs 3.65 in group B | Doesn’t specify the kind of mechanical complications | Bruxism plays an important role in the risk of implant failure | UNCLEAR
Manfredini et al. 2014 [2] | Systematic review | 14 studies about biological complications (3447 implants, 1000 patients); 7 studies about mechanical complications (700 patients = 1580 implants) | 3 of the included studies did a clinical diagnosis of bruxism, other studies used questionnaires. | 0-15 years (studies about biological complication); 4 years minimum (studies about mechanical complications) | Only 4 of the 14 studies identified a tendency for positive relation between implant failure and bruxism | Contradictory results | It’s unlikely for bruxism to be a risk factor for biological complications, but it can be a risk factor for mechanical complications | UNCLEAR
Ji et al. 2012 [2] | Retrospective | 40 patients (26 – 24) 39 implants in full arch rehabilitation | Average of 42 patients | Rate of failure: 29.3% in patients with bruxism vs 6.6% in patients without bruxism | NS | A higher risk of implant failure may be associated with bruxism. Doesnt specify the concept of failure | POSITIVE
Zupnik et al. 2011 [2] | Retrospective | 341 implants | 4 years minimum | OR between 0.22 and 0.28 | NS | Significant implant for negative failure | UNCLEAR
Eckert et al. 2001 [10] | Retrospective | 70 implants without bruxism; 7 implants in patients with bruxism | Based on previous clinical records. Lack of further specifications. | Average of 285 days, between 0-734 days | Hazard ratio 1.7 (P=0.56) | The studied implant showed a very low survival rate. | Bruxism didn’t have a statistically significant relation with implant failure. | NEGATIVE

The results of this review don’t prove, without a doubt, the relation between bruxism and an increased risk in implant failure.

Despite the fact that several studies presented a higher risk of implant failure within the studied population, keeping in mind the limitations of the same studies, the authors remain cautious in presenting definitive conclusions.

The heterogeneity of conclusions within the different studies may be linked to various factors, as the study design, the variety in analysis of available evidence and diagnosis criteria for bruxism in each study.

CONCLUSION

There is still a lot of controversy about the relation between bruxism and implant failure. More prospective studies with less bias, are needed to answer this question.

The possible association between implant failure and bruxism requires a detailed diagnosis of the existing parafunction in order to establish proper management of the problem during and after the rehabilitation treatment.

BIBLIOGRAPHIC REFERENCES