

The Association of Rheumatoid Arthritis and Systemic Lupus Erythematosus with Failing Implants

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Abstract

Objectives: Peri-implantitis is a chronic inflammatory disease that affects the bone surrounding the implant. It has become a common problem affecting the long-term survival of the implant with the increased use of implants for replacing the missing teeth. There are few studies that have examined the association between failing implants and Systemic lupus erythematosus (SLE), Rheumatoid Arthritis (RA) and Chronic Periodontitis (CP) with varying conclusions. The aim of this retrospective study is to compare and assess the risk for peri-implantitis in patients with SLE, RA, periodontitis.

Materials and Methods: Dental and medical patient records were retrospectively reviewed from electronic health records of Temple University School of Dentistry, Philadelphia, United States between 2008-2021 for peri-implantitis, systemic lupus erythematosus (SLE), Rheumatoid arthritis (RA) and Chronic periodontitis (CP). Peri-implantitis, Periodontitis are diagnosed based on Schwartz criteria and World Workshop 2017 classification. SLE & RA were identified as part of medical history reported by the patient.

Results: A total of 1231 patient records were analyzed. 832 patients (67.58%) had at least one systemic disease and 399 patients (32.25%) were systemically healthy patients. 109 patients (13.10%) patients who had systemic condition had peri-implantitis and 86.89% did not have any peri-implantitis. 3 patients with Rheumatoid Arthritis had peri-implantitis and only 12 patients with periodontitis had peri-implantitis. 47 Systemic Lupus Erythematosus patients did not have peri-implantitis.

Conclusions: The results of the present study indicate that Rheumatoid arthritis, Systemic lupus erythematosus and Chronic periodontitis did not pose any significant risk of getting peri-implantitis than systemically healthy patients.

Keywords: SLE: Systemic Lupus Erythematosus/ Lupus, RA: Rheumatoid Arthritis., CP: Chronic Periodontitis

Introduction

The restoration of missing teeth by dental implants has become a common practice in recent years (Charalampakis et al., 2012). It has been estimated that approximately 12 million dental implants are placed annually in a global perspective (Albrektsson et al., 2014). Osseointegration was discovered when working with implants in research animals (Albrektsson et al., 1981). The advent of osseointegration represented a true clinical breakthrough; for the first time ever, reliable long-term clinical results of oral implants were reported (Donath, 1992), (Eriksson et al., 1984). Various longitudinal studies have shown that the implant survival rates ranged from 90 -95% in a 20 year the long term follow up period that were in function. As such there is increasing rate of the complications that affect the long-term survival of implants, the most common finding of bone loss around the implants. The prevalence of peri-implantitis is estimated to be 5-56% in patients (Smeets et al., 2014). A recent systematic review and meta-analysis reported an incidence of peri-implantitis ranging from 0.4% over 3 years, to 43.9% within 5 years after implant restoration (Dreyer et al., 2018). In the past several etiologies have been proposed.

Presence of plaque biofilm as key causal factor for peri-implantitis (Fernandes & Gomes, 2016), foreign body response to implant (Albrektsson et al., 2014) and titanium corrosion particles in the soft tissue one of the etiologies of peri-implantitis. In this paper, we retrospectively inspected the predisposition of patients with Systemic lupus erythematosus, Rheumatoid arthritis and Chronic periodontitis with failing dental implants.

Materials & Methods

Patients dental implant records from Temple University School of Dentistry data base from 2008 to 2018 were retrospectively reviewed for diagnosis of Periodontitis, Rheumatoid Arthritis, Systemic lupus erythematosus and peri-implantitis according to the following criteria.

Definition of Peri-implantitis: Peri-implantitis was defined according to Schwarz et al (Ramanauskaite et al., 2018), Implant with a probing depth > 4 mm and signs of acute peri-implantitis (loss of supporting bone as estimated on radiographs, bleeding on probing or suppuration) and no implant mobility.

The above criteria were used in diagnosis of peri-implantitis.

Periodontitis: It is diagnosed based on new 2017 World Workshop classification (Papapanou et al., 2018) of Staging & Grading of Periodontitis which is based on severity of Interdental Clinical Attachment loss (CAL) & radiographic bone loss and tooth loss due to periodontitis and complexity of local factors to treat the periodontitis and extent/distribution of disease or based on Armitage 1999 classification as chronic periodontitis. (Armitage, 1999)

Patients were divided in to two groups (systemic diseases and no systemic diseases). Only two systemic diseases and patients who were diagnosed as having as one of these conditions by their physician (Lupus, Rheumatoid Arthritis) were used to assess the peri-implantitis outcome. Periodontitis patient's predisposition to peri-implantitis was also assessed.

Results

This study included the data of 1231 patients who underwent implant placement. After taking a thorough medical history into account, the patients were divided into two groups of each namely, with a systemic disease who totaled up to 832 patients (67.58%) and without any systemic disease totaled up to 399 patients (32.25%).

According to the observation in our study a total of 109 (13.10%) patients who had any systemic condition had peri-implantitis and 723 patients (86.89%) did not have any peri implantitis.

On further analysis, only 3 patients with rheumatoid arthritis had peri-implantitis whereas 112 (13.4%) patients didn't have any peri-implantitis. Similarly, 12 patients (10%) with periodontitis had peri-implantitis whereas 108 patients (90%) suffering with periodontal disease didn't have any peri-implantitis. But 47 patients who were suffering from SLE did not have peri-implantitis.

When observing patients without any systemic disease who underwent implant placement, it was found that 192 (48.12%) of a total 399 healthy patients had peri-implantitis, whereas 207 (51.87%) healthy patients who had implant placements didn't have any peri-implantitis.

Discussion

Peri-implantitis is the disease affecting the soft and hard tissues around implants. It is alarming due to increased implant placement in past 20-30 years. Many etiologies have been proposed such as the microbial link with systemic diseases and corrosive titanium particles (Berryman et al., 2020) and irregular maintenance therapy. In this study we retrospectively reviewed the dental and medical records of Temple University School of Dentistry electronic health records from 2008-2021 to assess patients with SLE, Rheumatoid Arthritis and periodontitis for their predisposition to periodontitis. In the present study only 3 (0.3%) RA patients had peri implantitis. Similarly, a systematic review (Turri et al., 2016) showed that there is no association between RA and peri-implantitis. Another systematic review by (Guobis et al., 2016), showed that the implant treatment success rate on RA patients to be 96.1%. Epstein Barr Virus is known to cause Systemic Lupus Erythematosus. A systematic review (Roca-Millan et al., 2021) found no statistically significant difference between peri-implantitis and healthy patients with respect to EBV presence in peri-implant sulcus. A systematic review (Sgolastra et al., 2015) revealed that patients with periodontitis has a moderate risk for peri-implantitis and higher risk for implant loss in contrast to our retrospective study patients with periodontitis may pose a moderate risk to peri-implantitis when compared to SLE and RA patients but not significantly higher risk when compared to healthy patients. Another review (Schwarz et al., 2018) showed that periodontitis patients are at increased risk for peri-implantitis especially with poor plaque control and not under regular maintenance care. In this present study we didn't notice the increased higher risk in periodontitis patients probably due to patients' good oral hygiene and regular maintenance care post implant therapy. Overall, we found SLE, Rheumatoid Arthritis patients do not pose additional risk to peri-implantitis and patients with periodontitis may pose relatively higher risk to peri-implantitis when compared to RA, SLE patients.

Conclusions

The results of the present study indicate that Rheumatoid arthritis, Systemic lupus erythematosus and Chronic periodontitis did not pose any significant risk of getting peri-implantitis than systemically healthy patients.

Conflicts of Interest

The authors report no conflict of interest.

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Vijaya Lakshmi Pavani Molli contributed to gathering of data, idea for study design and writing the manuscript.

Gautami Penmetsa contributed to study design and analyzing the results of data and revising the manuscript.

Chinhua Hsiao contributed to gathering the data, idea for study design, revising the manuscript.

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