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Review Article

Various risk factors associated with peri implantitis: A review

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ABSTRACT

There are so many factors which contributes to the development of the peri implantitis or may work as etiological factors which can lead to formation of peri implantitis. Peri implantitis can occur due to systemic conditions, due to local conditions, due to some personal habits like smoking, drinking, stress, tobacco chewing, not maintaining oral health properly. These all conditions, joined together and lead to formation of peri implantitis.

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1. Introduction

Usage of implants has become an important part in replacing the missing tooth or teeth in the oral cavity. In market there are various options available in replacing the missing tooth or teeth in the oral cavity, and the options available are usage of removable partial denture, fixed dental prosthesis, complete conventional dentures, and implants.¹ Choosing the definite prosthesis from the above said prosthesis, do depends upon the patients need as well as also depends upon how much the treatment is pocket friendly to the patient. Some of the patients, who are not be able to spend much amount of money, mostly opted for removable prosthesis, and the one who all are young patients, and concern more with esthetics as well as phonetics, go for fixed prosthesis. Now the fixed prosthesis can be given by two different ways, out of one is by giving crowns and bridges, but now a days most of the patients don't like their tooth or multiple teeth to be prepared, as they want their natural teeth as itself only.^{2,3} To avoid tooth preparation the most commonly

used fixed dental prosthesis is IMPLANT, as implant is an independent prosthesis and work as an independent tooth structure, without causing any harm to the natural tooth or the teeth.³

The most common biological complications which can hamper the implant is peri implantitis. It is an inflammatory disease which is totally destructive in nature and in severe cases leads to failure of the implant prosthesis. This disease initially started with the formation of pockets and finally leads to the resorption of the bone.^{4,5} The incidence of peri implantitis ranges in between 0.4 to 43.9 %, that too within 3 to 5 years of placement of implant.^{2,3,6}

1.1. Various factors associated with the formation of the peri implantitis are as follows

1.1.1. Diseases related to periodontium and different microbial agents associated along with it

If there is any history related to the periodontal diseases or if there is any diagnosis of periodontal disease, is the prime most factors which can lead to the formation of the peri implantitis. Some of the periodontal pathogens if present

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in the sub mucosal area, can lead to formation of peri implantitis. If there is presence of active periodontal disease in the adjacent tooth, there are chances that the implant might also get affected with the periodontal disease and this will definitely leads to the formation peri implantitis. It has also been seen that peri implantitis shows vast diversity of microbial agents, some of which are common in association with periodontal diseases.⁶ According to literature, the person who are suffering from periodontal disease, are twice prone to develop peri implantitis. Literature also revealed that, those patients who are having history of generalized aggressive periodontitis are found to be five times more prone to failure of the implant along with it they are fourteen times more susceptible to develop peri implantitis, when compared to the normal healthy person. To reduce the risk of developing peri implantitis, one should undergo periodontal treatment prior to the placement of the implant.^{2,3,6–11}

2. Oral Hygiene

Oral hygiene maintenance is of very importance, as the one who is not maintaining his or her oral hygiene is more prone to develop peri implantitis^{10–12}. As peri implantitis initiated with the accumulation of food debris around the implant, which leads to accumulation of microorganisms around the gingival soft tissues which leads to formation of plaque (which is rich in microorganisms) and calculus and ultimately leads to bone resorption.⁷

3. Smoking

In the literature, it has been stated that, smoking shows the negative effects on the periodontium. Smoking produces its effects by impairing the defense mechanism of the host. Smoking results in oxidative stress and helps in increasing the inflammatory burden along with alteration of the microbial flora in the periodontium. Smoking of cigarette also affects the normal process of wound healing. Literature revealed that, after the implant placement, patient is advised not to smoke, as smoking hampers the normal process of wound healing, and in case if patient did smoking in the initial period of implant placement, than it might lead to failure of the implant. Smoking increases the colonization of some of the periodontal pathogens like porphyromonas gingivalis and fusobacterium nucleatum around the implant. Literature stated that persons who smoke cigarettes are at double risk of developing peri implantitis as compared to the normal individual, who does not smoke.^{3,6–8}

Literature also stated that, in the absence of adequate oral hygiene, smokeless tobacco also found to be an associated reason for the development or progression of periodontal disease.^{4,5,12–15}

4. Systemic Conditions

Some of the conditions like diabetes mellitus, osteoporosis also affects the final out come of the implant procedure. Literature says that diabetes mellitus affects nearly about 415 millions of adults till date and it would be nearly about 640 millions people by 2040. Due to the disturbed levels of glucose in the body, this will lead to various neuropathological, retinal, micro vascular complications. The severity of the periodontitis, will be raised in poor glucose control. In the same way those who are suffering from diabetes are at higher risk of developing peri implantitis, because of vascular or cellular causes leads to severe destruction of the of the tissue and it also hampers the healing process of the individual.^{7–9} It has been stated that individuals who are having poorly controlled diabetes are at 46 percent higher risk of developing peri implantitis as compared to the individuals who have controlled levels of diabetes. Individuals those who have gone through the implant procedure and have poor glycemic control, do have more chances of failure of the implant, as they are more prone to have deeper peri implant pockets, which might lead to accumulation of food in the peri implant area and this will lead to higher and accelerated marginal bone loss near the implant and will lead to failure of the implant procedure ultimately.^{1,10,16}

One study quoted that rheumatoid arthritis is associated with the peri implantitis, but no significant data has been observed in this context. One study stated that there is increased marginal bone loss in those patients, who are having bisphosphonates and even in some of the cases, there is exposure of implant threads.^{4,5,12–18}

5. Other Factors

Other factors include, implant surface topography, implants those surfaces are moderately rough (etched surface) are found to be three times less affected by the process of peri implantitis, as compared to the one which are having highly rough surfaces or the machined ones. Other factors such as over loading of the implant or occlusal over load also leads to failure of the implant, as there will be concentration of stresses on the single point over the implant, which will be ultimately lead to stress concentration and lead to initiation of marginal bone loss, and finally leads to peri implantitis and failure of the prosthesis, so one should be aware of the proper occlusal scheme which needs to be given to the patient, so as to avoid stress concentration on the implant.^{12–15}

The condition of the soft tissue around the implant also influence the susceptibility to the peri implant diseases. There is a strong co relation found between the severity of the peri implantitis and the thin bio type of the soft tissue. For the purpose of good peri implant health and as well as long term stability of the implant, a healthy at least 2mm

zone of keratinized soft tissue, should be present as it is associated with the better plaque control.^{4,5,17,18}

6. Conclusion

In today's time, peri implantitis has been considered as a common and complex disease which is of multifactorial origin. One should have a proper knowledge of the implant procedure and one should go through the medical reports of the individuals, before planning for any implant treatment. As prognosis totally depends on the proper diagnosis and treatment planning.

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None.

8. Conflict of Interest

None.

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