

Original ARTICLE

Analysis of pulpal changes in patients with periodontitis

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ABSTRACT

Background: Periodontal infection is initiated by specific invasive oral pathogens that colonize dental plaque biofilms on tooth surface, and host immune response to inflammation plays a central role in disease pathogenesis. The differential diagnosis of perio-endo lesions has become increasingly important as the demand for complicated restorative work has grown. Hence; the present study was undertaken for assessing the pulpal changes in patients with periodontitis. **Materials & Methods:** A total of 100 patients with presence of severe chronic periodontitis were enrolled in the present study. 100 human teeth were obtained from patients with chronic periodontitis. Before extraction, thorough clinical examination was done along with radiographic analysis. All the extraction procedures were carried out under the hands of skilled and experienced oral surgeons. All the tooth specimens were sent for decalcification followed by histological analysis. **Results:** Pulp necrosis was found to be present in 75 percent of the patients. Pulp calcification was found to be present in 56 patients. Fibrosis and edema was found to be present in 25 patients and 19 patients respectively. **Conclusion:** Periodontal pathologies do have a deleterious effect on the pulp tissue.

Key words: Endo- Perio, Pulp

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INTRODUCTION

Periodontal infection is initiated by specific invasive oral pathogens that colonize dental plaque biofilms on tooth surface, and host immune response to inflammation plays a central role in disease pathogenesis. Periodontal diseases are recognized as infectious processes that require bacterial presence and a host response and are further affected and modified by other local, environmental and genetic factors. Association of periodontal infection with organ systems like cardiovascular system, endocrine system, reproductive system and respiratory system makes periodontal infection a complex multiphase disease.¹⁻³

The differential diagnosis of perio endo lesions has become increasingly important as the demand for complicated restorative work has grown. Neither periodontal nor endodontic treatment can be considered in isolation, clinically, as they are closely related and this treatment must influence the diagnosis and treatment. The controversy concerning the effect of periodontal disease pulp ranges between those who believe that pulpitis or pulp necrosis or both can occur as a result of periodontal inflammation to those who state categorically that pulpal changes are independent of the status of the periodontium.⁴⁻⁶ Hence; the

present study was undertaken for assessing the pulpal changes in patients with periodontitis.

MATERIALS & METHODS

The present study was conducted with the aim of assessing the pulpal changes in patients with periodontitis. A total of 100 patients with presence of severe chronic periodontitis were enrolled in the present study. Inclusion criteria for the present study included:

- Patients within the age group of 25 to 50 years,
- Patients with negative history of any known drug allergy,
- Patients who underwent dental extraction of teeth affected by severe chronic periodontitis
- Patients with pocket probing depth of more than 6 mm.

A total of 100 human teeth were obtained from patients with radiographic chronic periodontitis. Before extraction, thorough clinical examination was done along with analysis. All the extraction procedures were carried out under the hands of skilled and experienced oral surgeons. All the tooth specimens were sent for decalcification followed by histological analysis. All the results were recorded in Microsoft excel sheet and were analyzed

by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

In the present study, a total of 100 patients with chronic periodontitis were analyzed. Mean age of the patients was found to be 42.8 years. There were 62 males and 38 females. Pulp necrosis was found to be present in 75 percent of the patients. In the present study, pulp calcification was found to be present in 56 patients. Fibrosis and edema was found to be present in 25 patients and 19 patients respectively.

Table 1: Age and gender-wise distribution of patients

Parameter		Number of patients
Age group (years)	Less than 40	49
	More than 40	51
Gender	Males	62
	Females	38

Table 2: Pulp changes in periodontitis patients

Pulp changes	Number of patients	Percentage of patients
Pulp necrosis	75	75
Pulp calcification	56	56
Fibrosis	25	25
Edema	19	19

DISCUSSION

The periodontal diseases are highly prevalent and can affect up to 90% of the worldwide population. Gingivitis, the mildest form of periodontal disease, is caused by the bacterial biofilm (dental plaque) that accumulates on teeth adjacent to the gingiva (gums). However, gingivitis does not affect the underlying supporting structures of the teeth and is reversible. Periodontitis results in loss of connective tissue and bone support and is a major cause of tooth loss in adults. In addition to pathogenic microorganisms in the biofilm, genetic and environmental factors, especially tobacco use, contribute to the cause of these diseases. Genetic, dermatological, haematological, granulomatous, immunosuppressive, and neoplastic disorders can also have periodontal manifestations. Data from the past literature have reported significant pulpal changes in patients with periodontitis.⁷⁻⁹ Hence; the present study was undertaken for assessing the pulpal changes in patients with periodontitis.

In the present study, a total of 100 patients with chronic periodontitis were analyzed. Mean age of the patients was found to be 42.8 years. There were 62 males and 38 females. Pulp necrosis was found to be present in 75 percent of the patients. Gautam S et al evaluated the changes in pulp due to advanced periodontal disease. Forty caries-free teeth affected with severe periodontitis were collected from patients aged between 18 and 55 years. The collected teeth were stored in formalin for 24 h and were then decalcified and examined histologically after staining with hematoxylin and eosin to note the changes that occurred in pulp. Pulpal calcification (52.62%) and partial necrosis of pulp (52.62%) were found to be the most common findings. Inflammation, which was found in 47.38% of the cases, ranged from mild to severe in most sections and was always chronic. Pulp with complete necrosis was seen in 26.32% of cases. Fibrosis and pulpal edema were seen in 36.84% of cases. In the presence of moderate to severe chronic periodontitis, degenerative changes

such as inflammation, fibrosis, edema, calcification and necrosis were observed to variable degree.¹⁰ Caravan O et al assessed 67 patients with chronic marginal periodontitis who underwent tooth extraction, of which 29 had moderate periodontal lesions and 38 severe periodontal lesions. The microscopic study of the dental pulp revealed significant changes in all patients. In patients with moderate periodontitis the pulp tissue was found to be the site of an enhanced process of collagenous fibrosis associated with a moderate inflammatory infiltrate, dystrophic mineralization, reduced blood vascularization and arteriolosclerosis. The dental pulp of patients with severe periodontitis showed an abundant chronic inflammatory infiltrate associated with pulpal necrosis, vascular congestion, microhemorrhages, dentin demineralization and odontoblast impairment.¹¹

In the present study, pulp calcification was found to be present in 56 patients. Fibrosis and edema was found to be present in 25 patients and 19 patients respectively. Fatemi K et al evaluated the possible effects of moderate to advanced periodontal disease on the different aspect of dental pulp structure. Twenty hopeless permanent teeth were extracted from systemically healthy adults because of moderate to advanced chronic periodontitis, with a bone loss of >6 mm and a mobility of grade 2 or 3. Upon extraction, the apical 2 to 3 mm of the roots were immediately sectioned. Four to five sections were mounted on each slide, and every third slide was stained with hematoxylin and eosin. The specimens were histologically processed and examined by an oral pathologist. Non-inflamed pulp, with partial or complete necrosis in some sections and several non-necrotic sections, was found in only 6.3% of teeth. Most teeth (58.3%) displayed edematous pulps. Slightly fibrotic pulps were seen in 52.1% of sections. Odontoblastic integrity was seen in 31.3% of teeth. Most teeth (77.1%) displayed no pulp stones. In 43.8% of teeth, the pulp vessels displayed dilatation. Moderate to advanced periodontal disease can affect the dental pulp.¹²

CONCLUSION

From the above results, the authors concluded that periodontal pathologies do have a deleterious effect on the pulp tissue. Hence; further studies are recommended for further exploring the endo-perio relationship.

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