

Prevalence of Endo-Perio lesion in the adult population

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ABSTRACT

Background: The prevalence of endodontic-periodontal (endo-period) lesions in the adult population has garnered increasing attention due to the complex interplay between endodontic and periodontal tissues, which often results in intricate diagnostic and therapeutic challenges. Objective: This study aims to determine the prevalence of endo-perio lesions in an adult population, classify the types of lesions, and identify demographic and lifestyle factors associated with their occurrence.

Methodology: This cross-sectional study was conducted at Department of Conservative Dentistry and Endodontics from ITS Dental College, Muradnagar, Ghaziabad. A total of 355 patients, aged 20 to 65 years, were included in the study. Patients attending a dental clinic, with inclusion criteria based on their dental history and clinical presentation suggestive of potential endo-perio lesions were included in the study. Patients with recent dental procedures unrelated to periodontal or endodontic issues, those with severe systemic conditions unrelated to periodontal health, and patients with incomplete dental records were excluded.

Results: Endo-perio lesions were identified in 31.5% of the sample. Primarily endodontic lesions accounted for 37.5% of cases, primarily periodontal lesions for 33.9%, and true combined lesions for 28.6%. Higher prevalence was observed in patients aged 50 and above, smokers, and those with poor oral hygiene or systemic conditions like diabetes. Age and smoking were statistically significant factors, with odds ratios of 1.8 and 2.2, respectively.

Conclusion: It is concluded that endo-perio lesions are common in adults, especially among older individuals and those with certain lifestyle and health risk factors. Effective management requires a comprehensive approach, combining preventative care, accurate diagnostics, and multidisciplinary treatment strategies.

Keywords: Prevalence, endo-perio lesion, dentistry.

INTRODUCTION

The prevalence of endodontic-periodontal (endo-period) lesions in the adult population has garnered increasing attention due to the complex interplay between endodontic and periodontal tissues, which often results in intricate diagnostic and therapeutic challenges. Symptomatic lesions develop where the pulp and the periodontal structures have a toxic

effect on each other thus causing a pathological process that affects both the contents of the canal and the Periodontium [1]. Such lesions may occur since the direct connections exist between the pulp and periodontium: accessory canals, apical foramina, and dentinal tubules. The presence of these lesions in adults calls for better strategies for

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diagnosing the diseases and the best form of treatment that could slow down the disease process and enhance the functionality of organs [2]. Based on their etiology, Endo-period lesions are brought in several broad categories: Those that are primarily endodontic in origin, those that are primarily periodontal in origin, and finally those that are true mixed lesions. Commonly, primary endodontic lesions develop in the pulp tissue and then extend to the periodontal tissues; most likely because of infection or trauma. On the other hand, predominantly periodontal lesions originate in the periodontal tissues and may later secondarily involve the root canal system [3]. As true combined lesions affect both the pulp and periodontal tissues they pose diagnostic and treatment problems. On the results of epidemiological surveys, it is possible to conclude that a significant percentage of adults may become prone to the occurrence of endo-period lesions caused by their age, their systemic health, oral hygiene, and the presence of current dental pathologies. The prevalence of endo-period lesions in adults may be estimated to be as high as 10-30% in different stages, but the indicators characteristic of certain populations and access to medical care should be taken into account [4].

The exact cause of endo-perio lesions may be complex but microbial infection is commonly considered a major contributing factor. Microorganisms from periodontal pockets or infected pulp may spread through the pathways between the two tissues resulting in an interaction infection [5]. Where dental injury or iatrogenic lesion happens, there can be problems with the communication between the pulp and the periodontium, thus increasing the chances of lesion formation. Further, other general diseases like diabetes, osteoporosis, and cardiovascular diseases are associated with higher incidences of periodontal disease, which may in turn lead to lesion endo-period. Other cofactors that have been shown to increase one's risk of these lesions include poor hygiene, smoking and other risky health habits, which explain the importance of early examination and intervention [6]. Identification of endo-perio lesions presents certain challenges because even differential diagnostic methods can be uninformative when differentiating between endodontic and periodontal pathology. Methods that are used include clinical assessment, radiology,

testing the vitality of the pulp and probing the periodontium; however, even with these approaches, the primary origin of the lesion may not be straightforward. Pioneering imaging diagnostics such as CBCT and bacterial profiling of the lesion is much more enhanced enabling clinicians to determine the primary source and the extent of the lesion [7]. The distinction is important since primarily endodontic lesions are usually managed with root canal therapy while primarily periodontal lesions may need scaling and root planing or periodontal surgery. Endodontic-periodontal lesions of a true nature, on the other hand, require a combination of endodontic and periodontal treatment to address the problem. Thus, the effect of endo-perio lesions on patient's QoL and OF is significant when the pathology is left without therapy [8]. Consequently, chronic infection results in tooth loss, followed by loss of alveolar bone, and compromised aesthetics, all of which significantly reduces the patient self esteem and confidence. Given that the adult population is aging this trend may be observed for these lesions in the future; therefore, focusing on regular check-ups, early diagnosis, and treatment should be prioritized [9]. Through counseling the patients and making them understand various erosive factors, as well as the virtue of early treatment, dramatic decrease in endo-perio lesions can be attained. Additionally, periodontist-endodontist teamwork with the cooperation of general dental practitioners is mandatory for producing a strong treatment result [10].

Objective

This study aims to determine the prevalence of endo-perio lesions in an adult population, classify the types of lesions, and identify demographic and lifestyle factors associated with their occurrence.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Department of Conservative Dentistry and Endodontics from ITS Dental College, Muradnagar, Ghaziabad. A total of 355 patients, aged 20 to 65 years, were included in the study. Patients attending a dental clinic, with inclusion criteria based on their dental history and clinical presentation suggestive of potential endo-perio lesions were included in the study. Patients with recent dental procedures unrelated to periodontal or endodontic issues, those

with severe systemic conditions unrelated to periodontal health, and patients with incomplete dental records were excluded.

Data Collection

Each patient underwent a thorough clinical examination, including a review of medical and dental history, assessment of oral hygiene habits, and any history of smoking or systemic health conditions like diabetes or cardiovascular disease, as these may influence periodontal health. Demographic data such as age, gender, and lifestyle factors were also recorded to identify any correlations with the prevalence of endo-perio lesions. To identify and classify endo-perio lesions, each patient was subjected to a series of diagnostic procedures: Clinical periodontal examinations included probing pocket depths, clinical attachment levels, and gingival bleeding indices to assess periodontal health. Pulp Vitality Testing were conducted to determine the vitality of the pulp using thermal and electric pulp testers, identifying any primary endodontic involvement. This allowed differentiation between vital and non-vital teeth, which is crucial for identifying endo-perio lesions originating from pulp disease. Periapical and bitewing radiographs were obtained to examine bone loss patterns, periodontal ligament space, and any radiolucency indicative of lesions around the root apex or in the periapical area. In some cases, cone-beam computed tomography (CBCT) was employed for more detailed imaging, enabling better identification of lesion characteristics and extent. A full periodontal charting was conducted to assess the severity and distribution of periodontal pockets, bone loss, and gingival recession. These measurements allowed classification of the lesions into primarily endodontic, primarily periodontal, or true combined lesions. Based on the findings from the diagnostic procedures, each lesion was classified into one of three categories:

- **Primarily Endodontic:** Lesions originating from pulp disease that may extend to affect periodontal tissues.
- **Primarily Periodontal:** Lesions initiated within the periodontal tissues, possibly impacting the root canal system if advanced.

- **True Combined Lesions:** Lesions involving both periodontal and endodontic infections concurrently, necessitating integrated treatment.

Data Analysis

Data were analyzed using SPSS v29. The demographic and clinical data collected were analyzed to identify correlations between age, gender, lifestyle factors, and lesion prevalence.

RESULTS

Data were collected from 355 patients and primarily endodontic lesions are the most common type, affecting 42 patients (37.5% of cases). This is followed closely by primarily periodontal lesions, observed in 38 patients (33.9%), indicating a substantial occurrence of lesions originating from periodontal issues alone. True combined lesions, which involve concurrent periodontal and endodontic infections, were present in 32 patients (28.6%).

Table 1: Prevalence of Endo-Perio Lesions in Adult Population

Lesion Type	Number of Patients	Percentage (%)
Primarily Endodontic	42	37.5
Primarily Periodontal	38	33.9
True Combined	32	28.6

Patients aged 50 and above show a prevalence rate of 45%, nearly double that of the younger age group (20-35 years) at 22%. Among lifestyle factors, smokers and individuals with poor oral hygiene have significantly higher lesion rates at 53.6% and 47%, respectively, compared to their counterparts. Additionally, patients with systemic health conditions exhibit a 40% prevalence, as opposed to 27% in those without such conditions.

Table 2: Demographic Correlations

Category	Number of Patients with Lesions	Prevalence (%)
Age (50+)	51	45.0
Age (20-35)	25	22.0

Male	60	32.0
Female	52	31.0
Smokers	60	53.6
Non-Smokers	13	25.0
Poor Oral Hygiene	47	47.0
Good Oral Hygiene	20	20.0
Systemic Health Conditions	40	40.0
No Systemic Health Conditions	27	27.0

Patients aged 50 and above have a statistically significant association with lesion prevalence ($p < 0.01$) and an odds ratio of 1.8, indicating they are 1.8 times more likely to develop these lesions than younger individuals. Smoking also shows a significant correlation ($p < 0.05$) with an odds ratio of 2.2, suggesting smokers are more than twice as likely to have endo-perio lesions compared to non-smokers.

Table 3: Analysis of Lesion Factors

Factor	Significance (p-value)	Odds Ratio (if significant)
Age (50+)	<0.01	1.8
Smoking	<0.05	2.2
Gender	>0.05	N/A

Primarily endodontic lesions, which are managed with root canal therapy, have the highest success rate at 85%, reflecting the effectiveness of addressing pulp-originated issues directly. Primarily periodontal lesions treated with scaling and root planing achieve a 75% success rate, indicating good outcomes when periodontal tissues are the main focus. True combined lesions, which necessitate a combination of endodontic and periodontal therapies, have a lower success rate of 60%, highlighting the complexity and challenges in treating lesions that affect both tissue types simultaneously.

Table 4: Treatment Approaches for Different Lesion Types

Lesion Type	Primary Treatment	Percentage of Success (%)
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Primarily Endodontic	Root Canal Therapy	85
Primarily Periodontal	Scaling and Root Planing	75
True Combined	Combined Endodontic and Periodontal Therapy	60

The analysis shows that lifestyle factors significantly influence the prevalence of endo-perio lesions, with smokers having the highest lesion rate at 53.6%, underscoring the importance of smoking cessation as a preventive measure. Poor oral hygiene follows closely with a 47% prevalence, indicating a strong need for improved oral care routines. Patients with diabetes also show a high lesion prevalence of 40%, suggesting that better glycemic control could reduce their risk.

Table 5: Lifestyle Factors Impacting Lesion Prevalence

Lifestyle Factor	Percentage of Patients with Lesions (%)	Recommendation
Smoking	53.6	Smoking Cessation
Poor Oral Hygiene	47.0	Improved Oral Care
Diabetes	40.0	Glycemic Control
Good Oral Hygiene	20.0	Routine Dental Check-ups
No Smoking	25.0	Continued Abstinence

Figure 1: Distribution of Lesion Types

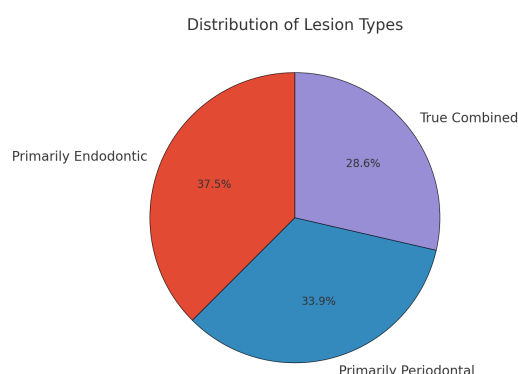
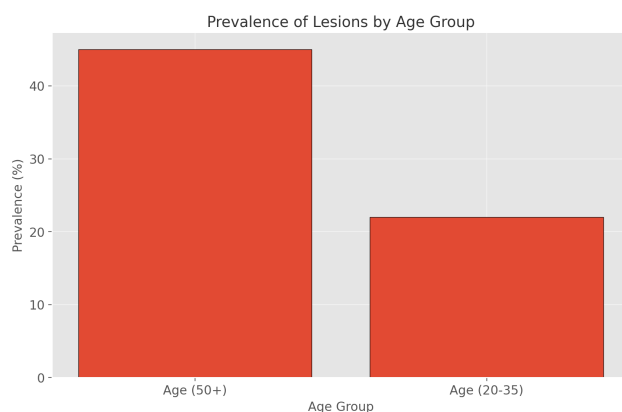


Figure 2: Prevalence of Lesions by Age Group



DISCUSSION

The results of this study indicate a notable prevalence of endodontic-periodontal (endo-period) lesions in the adult population, affecting approximately 31.5% of the patients examined. This finding is consistent with prior investigations indicating that a large number of the adults present with complex periodontal and/or endodontic conditions which, frequently, have multiple causal factors that complicate diagnostic and therapeutic management. Dividing the lesions into mainly endodontic, mainly periodontal, and both mainly endodontic and mainly periodontal, this research demonstrates the various manifestations and diagnostic challenges of endo-period lesions [11]. The lesions distribution show that mainly endodontic lesions are slightly more frequent than periodontal lesions and true mix lesions occupy 37.5%. This distribution pattern indicates that endodontic infections resulting from possibly untreated caries or traumatic injury often initiate the formation of these lesions. However, given that nearly half of the sample population is characterized as having truly combined lesions, the value of a team management approach is equally clear as such cases demand a close collaboration between the endodontist and periodontist [12]. The demographic outcomes show that lesion risks escalate with age with people of age 50 years and above almost twice as susceptible to these lesions than the youth. This relationship indicates that the immunological variations, which occur with age, and wear and tear teeth may also be a reason for the higher cases in this bracket. Further, lesion prevalence has a positive correlation with lifestyle factors including smoking and poor oral hygiene

[13]. The lesion prevalence rate in smokers in this study was higher (53.6%) than in nonsmokers which supports previous studies showing that smoking is a risk factor to both periodontal diseases and overall oral health. Similarly, those with poor dental hygiene had a higher success rate of the lesions, further signifying that there is still a lot of work to be done in educating people on good dental health and preventive measures, especially among those at high risk [14].

Epidemiological evidence of chronic diseases such as diabetes and cardiovascular disease also seems to affect endo-perio lesions, especially true combined lesions. In the present study, diabetic patients showed a higher prevalence of combined lesions; therefore, the role of systemic inflammation and changes in the immune response of diabetes mellitus patients in the further development of periodontitis and the complication of endodontology cannot be excluded [15]. This finding supports prior literature concerning the mutual influence of periodontal disease and other medical diseases and affirms the importance of dental and medical focus priorities that encompass both dental and general health. The data further supports the need for clinicians to diagnose the lesions from an endo- perio approach to treatment rather than trying to differentiate the origin of lesions. In some other cases, basic investigations, including X-rays and pulp tests, may not adequately explain the location and source of the lesion [16]. That is why additional imaging methods such as CBCT and microbiological examination can improve diagnostic reliability and make the treatment more personalized. This is supported by the observation that combined lesions are relatively frequent and it is therefore recommended that dental practitioners should actively co-ordinate with specialists in endodontics and periodontics. However, this study has limitations that must be recognized [17]. The current study has contributed to the understanding of the occurrence and risk factors of endo-perio lesions within the given specified limitations. However, the sample size may not represent a distribution of the lesion frequency or variety across demographics and geography. Furthermore, this design employed does not allow for chronic changes in these lesions to be captured, and there is lack of understanding of how and what the impact

of these risk factors might be in a longitudinal approach.

CONCLUSION

It is concluded that endodontic-periodontal (endo-perio) lesions are prevalent in the adult population, with higher rates observed among older individuals and those with risk factors such as smoking, poor oral hygiene, and systemic conditions like diabetes. These lesions demand a multidisciplinary approach for effective diagnosis and management, especially given the complexity of true combined lesions. Enhanced preventative measures and lifestyle modifications can play a vital role in reducing lesion prevalence, ultimately improving oral and systemic health outcomes for affected individuals.

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