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PREVALENCE OF DIFFERENT PERIAPICAL LESIONS USING PERIAPICAL RADIOGRAPHS- A HOSPITAL BASED STUDY

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ABSTRACT

Aim: To diagnose the periapical lesions using intraoral periapical radiographs. **Introduction:** Radiographic examination of lesions is an indispensable adjunct to clinical examination in Oral medicine. Intraoral periapical radiography has become increasingly popular for diagnosis in Dentistry. Periapical lesions may be associated with conditions of both Endodontic and non Endodontic origin. **Materials and Method:** It is a retrospective study conducted in a hospital setting. The data of patients with periapical lesions was retrieved from DIAS. The data was tabulated in Excel and statistically analysed using SPSS version 23.0. **Results**: 62% of patients had periapical abscess, 21% had periapical cyst and 12% had periapical granuloma. Among males, 19% had periapical cyst, 36% had periapical abscess and 7% had periapical granuloma. Among females, 7% had periapical cyst, 26% had periapical abscess and 5% had periapical granuloma (p value > 0.05, not significant). Among the 20-40 years age group, 9% had periapical cyst, 13% had periapical abscess and 2% had periapical granuloma. Among the 40-60

years age group, 15% had periapical cyst, 33% had periapical abscess and 6% had periapical granuloma. Among the 60-80 years age group, 2% had periapical cyst, 16% had periapical abscess and 4% had periapical granuloma (p value > 0.05, not significant). **Conclusion**: Periapical abscess had the highest prevalence among all periapical lesions diagnosed in patients using periapical radiography. Males had a higher prevalence of periapical lesions than females. Age group 40-60 years had the highest prevalence of all periapical lesions.

Keywords: Abscess; Cyst; granuloma; lesion

INTRODUCTION

Periapical lesions are the most commonly occurring pathological lesions seen in alveolar bone. They act as barriers that restrict the entry of microorganisms and prevent their spread into the surrounding tissues **[1]**. These microorganisms can induce the periapical lesions, either primarily or secondarily. Resorption of bone occurs followed by deposition of a granulomatous tissue and a dense wall of polymorphonuclear leukocytes **[2]**. However few endodontic pathogens and toxins can penetrate through these barriers and establish peri-radicular infections **[3]**. Periapical radiolucency is the most common radiographic sign of these lesions which may or may not be accompanied by intraoral swelling **[4]**. Most of the periapical lesions may heal following non-surgical endodontic treatments. For assessment of healing potential, at least a period of 6 to 12-months after root canal treatment should be considered **[5]**. Also postponing the placement of coronal restoration increases the risk of tooth fracture. The remaining sound tooth structure and occlusion should be considered during treatment planning **[6]**. However, the presence of a lesion in a radiograph should not be the only reason for commencing retreatment in teeth with proper root canal treatment **[7]**. Periapical granulomas are made of solid soft tissue, whereas periapical cysts have a semi-solid, liquefied cystic area **[8]**. The least dense area of the periapical lesion in radiograph should be measured to diagnose the type of lesions correctly. Measurement of gray value helps in differentiating soft tissues and fluid or empty areas **[9]**. Periapical abscess has similar features like periapical granulomas and periapical cysts with a varying degree of peripheral cortication, thereby making it difficult to distinguish them from each other **[10]**. Cortical perforation seen in CBCT examinations of these lesions and the presence of edema might provide help in

differentiating periapical abscesses **[11]**. However during the early stages of periapical abscess, they do not present these characteristics. Histopathologic evaluation is the ideal method of differentiating between the periapical radiolucencies of endodontic origin; it is rarely carried out as these diseases often resolve with non-surgical endodontic treatment **[12]**. Treatment of all these periapical lesions is either root canal treatment, periradicular surgery, extraction, or a combination of them **[13]**. Our team has extensive knowledge and research experience that has translated into high quality publications **[14-33]**. In this present study, different types of periapical lesions were diagnosed using periapical radiographs and its association between age group and gender of the patients were assessed using statistical analysis.

MATERIALS AND METHODS

This is a Retrospective cross sectional study conducted in a University setting. The study setting had certain advantages like flexibility in data collection and less expenditure. However it had few disadvantages as it is an unicentric study and has geographical limitations. The ethical approval for the current study was obtained from the Institutional Review Board. The data of patients diagnosed with periapical lesions were retrieved from the case sheets of patients. The required data from September 2019 to March 2021 were collected and reviewed. The inclusion criteria for the study were patients with periapical lesions and those who had undergone endodontic or surgical treatment. Exclusion criteria were the incomplete data and were excluded from the study. The necessary data such as Age, Gender and the type of periapical lesions among the patients were collected and tabulated in Excel. The data was cross verified by the analyser. The tabulated data from Excel was imported to SPSS version 23.0 for statistical analysis. The data was represented by the means of bar graphs and the statistical tests used were Chi square and correlation analysis. The prevalence of different periapical lesions and its association with age and gender of the patients were analysed.

RESULTS

62% of the patients had periapical abscess, 26% had periapical cyst, and 12% had periapical granuloma **(Figure 1)**. Among the total patients who had periapical lesions, 62% were males and 38% were females. Males had higher prevalence of periapical cyst, periapical abscess and periapical granuloma **(Figure 2)**. 24% of them belong to the 20-40 years age group, 54% of them

belong to the 40-60 years age group and 22% of them belong to the 60-80 years age group. Age group of 40-60 years had higher prevalence of periapical cyst, periapical abscess and periapical granuloma **(Figure 3)**. Among males, 19% had periapical cyst, 36% had periapical abscess and 7% had periapical granuloma. Among females, 7% had periapical cyst, 26% had periapical abscess and 5% had periapical granuloma (p value > 0.05, not significant) **(Figure 4)**. Among the 20-40 years age group, 9% had periapical cyst, 13% had periapical abscess and 2% had periapical granuloma. Among the 40-60 years age group, 15% had periapical cyst, 33% had periapical abscess and 6% had periapical granuloma. Among the 60-80 years age group, 2% had periapical cyst, 16% had periapical abscess and 4% had periapical granuloma (p value > 0.05, not significant) **(Figure 5)**.

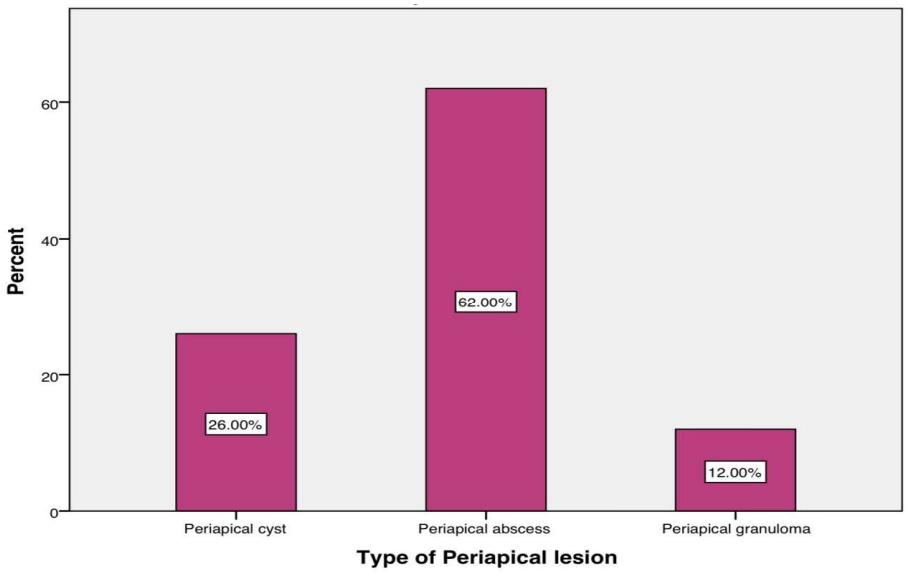

Figure 1: Bar graph showing the Type of periapical lesion diagnosed. X axis represents the type of periapical lesion and Y axis represents the percentage of patients. 62% of patients had Periapical abscess, 26% had periapical cyst and 12% had periapical granuloma

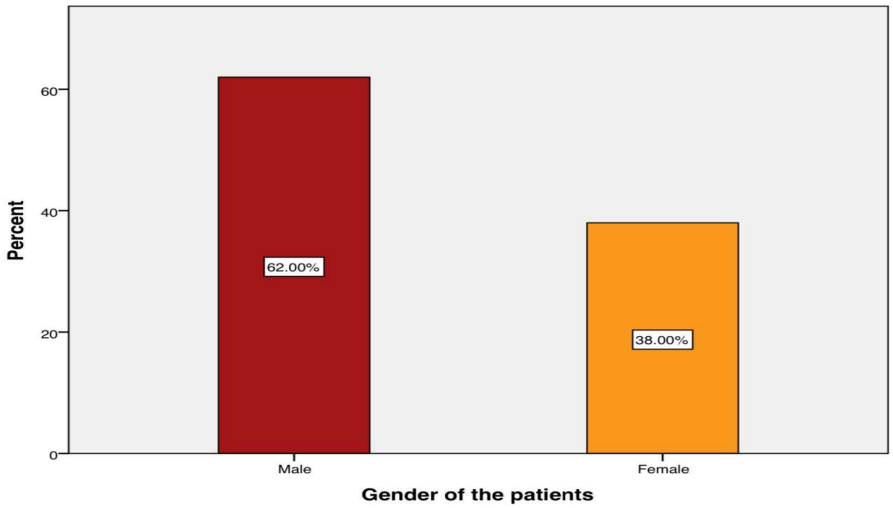

Figure 2: Bar graph showing the gender of patients with periapical lesions. X axis denotes the gender of the patients and Y axis denotes the percentage of patients. Among the total patients who had periapical lesions, 62% were males and 38% were females

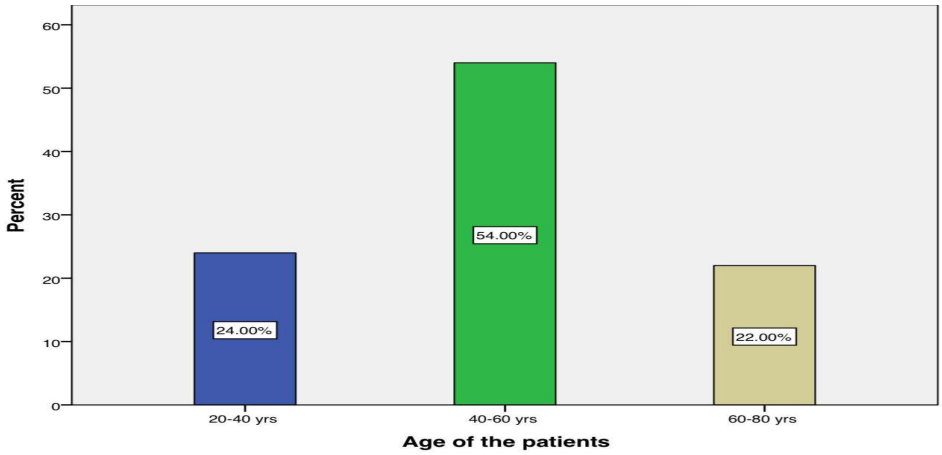

Figure 3: Bar graph showing the age group of patients with periapical lesions. X axis denotes the age group of the patients and Y axis denotes the percentage of patients. Among the total patients who had periapical lesions, 54% belonged to the 40-60 years age group, 24% belonged to the 20-40 years age group and 22% belonged to the 60-80 years age group

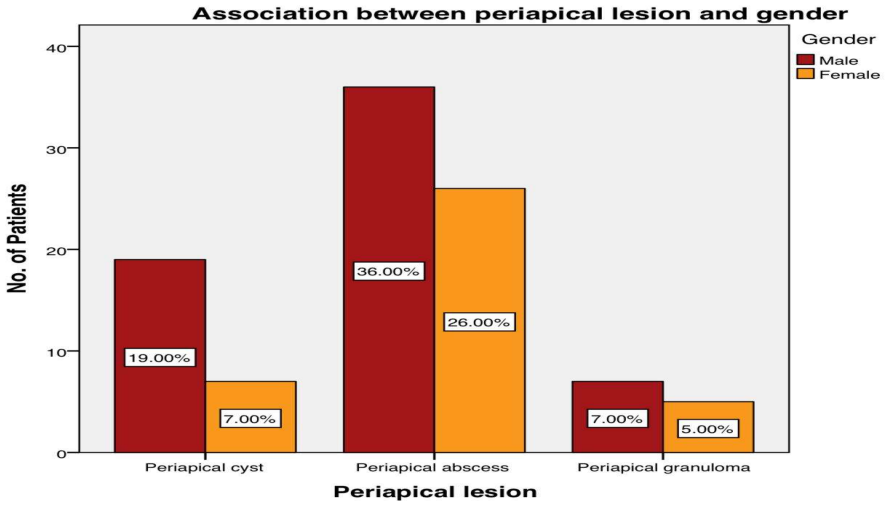

Figure 4: Bar graph showing the association between periapical lesions and gender of the patients. X axis denotes the type of periapical lesion and Y axis denotes the number of patients. Among males, 19% had periapical cyst, 36% had periapical abscess and 7% had periapical granuloma. Among females, 7% had periapical cyst, 26% had periapical abscess and 5% had periapical granuloma (p value > 0.05, not significant)

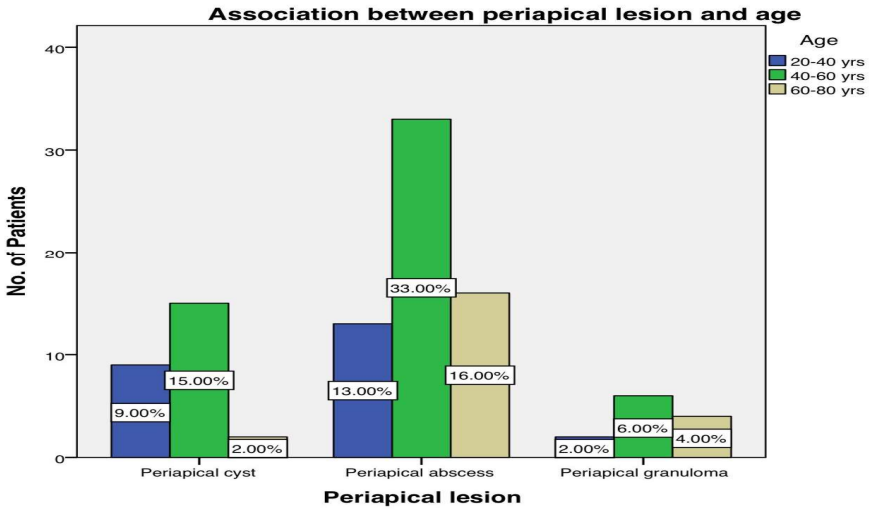

Figure 5: Bar graph showing the association between periapical lesions and the age group of the patients. X axis denotes the type of periapical lesion and Y axis denotes the number of patients. Among the 20-40 years age group, 9% had periapical cyst, 13% had periapical abscess and 2% had periapical granuloma. Among the 40-60 years age group, 15% had periapical cyst, 33% had periapical abscess and 6% had periapical granuloma. Among the 60-80 years age group, 2% had periapical cyst, 16% had periapical abscess and 4% had periapical granuloma (p value > 0.05, not significant)

DISCUSSION

In this study, different periapical lesions were diagnosed using periapical radiography. However there was no statistical significance of association between the type of periapical lesion, age and gender of the patients. Radiographic examination of tooth and periradicular tissues is an adjunct to clinical examinations in oral medicine and endodontics. It plays a significant role in

visualizing periapical lesions of the bone **[34]**. Intraoral periapical radiography using radiographic film has been the most common technique for years. With improvement in technology, digital radiography gained popularity in the dental clinic and hospitals. Cone beam computed tomography (CBCT) was also introduced to visualize periapical bone loss that cannot be visualized using periapical radiographs **[35]**. The diagnosis of periapical lesions are commonly based on conventional radiography and this plays a significant role in determining the treatment plan. The treatment could either be non surgical root canal therapy in most cases or by surgical RCT when it is necessary to remove the cystic lining of the lesion **[36]**. Accurate diagnosis of periapical pathology is important to avoid needless treatment and also to increase the patient's confidence in the dentist. Majority of cases studied were diagnosed as cystic lesions clinically **[37]**. The clinical/ radiological diagnosis of periapical cyst is based on the presence of well-defined cystic cavity seen in radiographs **[38]**. With advanced imaging modalities that give multiple fields of view like Cone beam computed tomography, better results are obtained by improving the visualization of periapical region and lesions **[39]**. Periapical lesions diagnosed in non root canal filled teeth has a big implication in the public health point of view. Some teeth with periapical lesions may be left untreated because they were asymptomatic **[40]**. For example, asymptomatic apical periodontitis appears as an apical radiolucency and does not present clinical symptoms. The prevalence of periapical lesions varies widely **[41]**. Further studies should be compared with other similar studies and should be made with caution because of the variation in sample sizes, types of radiographs used, and criteria of evaluation.

Limitations of the study

This study is limited by a few factors. The sample size can be expanded and it is also a short duration study. Some of the patients may be asymptomatic and may be left undiagnosed. The study also has geographical limitations since it is a hospital setting. However, various difficulties were faced when studying the diagnosis and prevalence of periapical lesions, which includes doctors or clinicians with variations in levels of knowledge, skill and experience, inconsistencies in judgments and research bias. Another issue faced is that the division between the disease and non-disease remains unclear.

CONCLUSION

Within the limits of the study, it is observed that Periapical abscess had the highest prevalence among all periapical lesions diagnosed in patients using periapical radiography. Males had a higher prevalence of periapical lesions than females. Age group 40-60 years had the highest prevalence of all periapical lesions. As these periapical lesions constitute a potential oral health risk, the issue needs to be addressed in the community by applying screening tools for asymptomatic cases thereby preventing any complications.

Future scope of the study

A large sample size of patients from different ethnicities would give better results for the study. Other epidemiological studies covering extended time periods would help in collecting important information and validate the findings further. The significance of periapical radiographic assessment during the overall clinical examination of the patient, especially for older adults should be considered. Further studies should have adequate sample size for an accurate diagnosis, prevalence, causes and associated factors of periapical lesions

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Conflict of Interest

Authors declare no potential conflict of interest

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