Turkish Online Journal of Qualitative Inquiry (TOJQI) Volume 12, Issue 5, June 2021: 1492 - 1501

Evaluation Of Number Of Teeth That Underwent Periapical Lesion Management And Its Relationship With Gender - A Retrospective Analysis

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Abstract

Periapical Lesions Develop As Sequelae To Pulp Disease. They Often Occur Without Any Episode Of Acute Pain And Are Discovered On Routine Radiographic Examination. The Incidence Of Cysts Within Periapical Lesions Varies Between 6 And 55%. The Occurrence Of Periapical Granulomas Ranges Between 9.3 And 87.1%, And Of Abscesses Between 28.7 And 70.07%. The Aim Of Our Study Is To Evaluate The Number Of Teeth That Underwent Periapical Lesion Management And Its Relationship With Gender In Saveetha Dental College And Hospitals. This Study Is A Retrospective Study Conducted In A University Hospital Setting. The Study Population Consists Of 15 Patients With Periapical Lesions Who Had Reported To The Department Of Conservative And Endodontics, Saveetha Dental College And Hospitals, Chennai, India. The Data Regarding The Age, Gender, Number Of Teeth That Underwent Periapical Lesion Management And Clinical Presentation Of The Patients Were Retrieved From Patients Records And Analysed .The Data With A Total 86000 Patients Records Between June2019 To March 2020 Were Taken And After Fulfillment Of Inclusion And Exclusion Criteria, A Final Sample Of 15 Patients Were Considered. The Data Were Tabulated And Analysed By Spss Software And Statistics Done Using Chi Square Test With Significance Kept At P<0.05. In The Present Study, Majority Of The Study Population Was In The Age Group Of 10- 25 Years And Males(63.3%) Dominated The Study Population Than Females (13.3%). It Was Found That A Higher Prevalence Of Periapical Lesion Management Was Performed In Maxillary Central Incisors With Male Predominance.

Keywords: Periapical Lesion, Granulomas, Abscesses, Radiographic Examination Maxillary Anterior,

Introduction

Bacterial Infection Of The Dental Pulp May Lead To Periapical Lesions [(Barbakow, Cleaton-Jones And Friedman, 1981)]. They Are Generally Diagnosed Either During Routine Dental Examinations Or Following Acute Pain In A Tooth [(Möller *Et Al.*, 1981)]. Most Periapical Lesions(>90%) Can Be Classified As Dental Granulomas, Radicular Cysts Or Abscesses. The Incidence Of Cysts Within Periapical Lesions Varies Between 6 And 55% [(Bhaskar, 1966)] The Occurrence Of Periapical Granulomas Ranges Between 9.3 And 87.1% And Of Abscesses Between 28.7 And 70.07%[(Fernandes And Ataide, 2010)]. There Is A Clinical Evidence That As The Periapical Lesions Increase In Size, The Proportion Of The Radicular Cysts Increases. However Some Large Lesions Have Been Shown To Be Granulomas [(Ramachandran Nair, Pajarola And Schroeder, 1996)]. The Definitive Diagnosis Of A Cyst Can Be Made Only By A Histologic Examination. However A Preliminary Clinical Diagnosis Of A Periapical Cyst Can Be Based On The Following: (A) The Periapical Lesion Is Involved With One Or More Non-Vital Teeth, (B) The Lesion Is Greater Than 200 Mm2 In Size, (C) The Lesion Is Seen Radiographically As A Circumscribed, Well- Defined Radiolucent Are Bound By A Thin Radiopaque Line And (D) It Produces Straw-Coloured Fluid Upon Aspiration Or A Drainage Through An Accessed Root Canal System [(Schulz *Et Al.*, 2009)].

Periapical Lesion Results From Serious Inflammatory Response To Microorganisms Around The Tooth Root And The Root Canal [(Dhillon *Et Al.*, 2014)]. Periapical Lesions Could Perforate Into The Oral Cavity Affecting Hard Tissue Or Maxillary Sinus. The Infection Around The Root And Tooth Leads To Bone Resorption Caused By Local Osteomyelitis [(Fehrenbach And Herring, 1997)]. Furthermore, Cellulitis In Soft Tissue Causing Swelling In The Face Is A Common Symptom Of Severe Local Jawbone Osteomyelitis. Traumatic Injuries Of Teeth Can Cause Granuloma Or Cysts Associated With Periapical Lesions. Granulomas Are Composed Usually Of Solid Soft Tissue, While Cysts Are Semisolid Tissue Surrounded By Epithelium [(Simon *Et Al.*, 2006)]. Radiographs Show Lesions Structure As Unilocular, Lucent, Round, Or Pear Shaped Contoured By A Thin Rim Of Cortical Bone [(Sood *Et Al.*, 2015)]. The Incidence Of Cysts Formation Is Between 6 And 55% In Small Lesions And A 100% With Lesions Larger Than 20 Mm [(Fehrenbach And Herring, 1997)]. On The Other Hand, Granulomas Occurrence Ranges Between 9.3 And 87.1%, Where Abscesses Formation Rate Is Between 28.7 And 70.07% [(Simon *Et Al.*, 2006)]. Epithelial Proliferation And Other Molecular Mechanisms Can Cause Lesion Formation. Nonetheless, By-Products Of Microorganisms, Which Lead To Osmotic Fluid Accumulation In The Lumen, Are The Most Common Cause Of Periapical Lesions [(Nair, 1998)].

The Ultimate Goal Of Endodontic Therapy Should Be To Return The Involved Teeth To A State Of Health And Function Without Surgical Intervention [(Salamat And Rezai, 1986)]. All Inflammatory Periapical Lesions Should Be Initially Treated With Conservative Non-Surgical Procedure [(Lin, Huang And Rosenberg, 2007)]. Surgical Intervention Is Recommended Only After Non-Surgical Techniques Have Failed. Besides, Surgery Has Many Drawbacks, Which Limit Its Use In The Management Of Periapical Lesions [(Gupta Et Al., 2014)].. Management Of Infection-Caused Periapical Lesions Is A Two-Step Process. Firstly, Antibacterial Treatment Is Performed Using Antibiotics (E.G., Metronidazole, Ciprofloxacin, And Minocycline), Chemical Irrigation, And Disinfectants (I.E., Calcium Hydroxide) [(Leonardo Et Al., 2006)].Previously Our Team Has A Rich Experience In Working On Various Research Projects Across Multiple Disciplines The (Somasundaram Et Al., 2015; Hafeez And Others, 2016; Krishnan Et Al., 2018)(Choudhari And Thenmozhi, 2016; Dhinesh Et Al., 2016; Gurunathan And Shanmugaavel, 2016; Sneha And Others, 2016; Govindaraju And Gurunathan, 2017; Kumar And Rahman, 2017; Felicita And Sumathi Felicita, 2018; Saravanan Et Al., 2018; Vijayakumar Jain Et Al., 2019; Wu Et Al., 2019; Palati Et Al., 2020; Paramasivam, Vijayashree Priyadharsini And Raghunandhakumar, 2020) However, This Study Aims At The Evaluation Of Teeth That Underwent Periapical Lesion Management And Its Relationship With Gender.

Materials And Methods

Study Setting And Sampling: This Study Is A Single-Centre Retrospective Study, Carried Out In The Conservative And Endodontics Department In A Private Dental College. The Present Study Was Approved By The Ethical Board Of The Institution – Institutional Ethical Committee [Iec] (Ethical Approval Number: Sdc/Sihec/2020/Diasdata/0619-0320)And Was In Accordance With The Ethical Standards That Were Stipulated. All Available Records Of Patients With Cleft Lip From June 2019 – April 2020, Were Examined And Included In Our Data Collection. A Total Of 86000 Case Sheets Were Reviewed. Cross Verification Of Data For Error Was Done By Presence Of Additional Reviewers And By Photographs Evaluation. Two Examiners Were Involved In The Study.

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Data Collection- Acquisition Of Data Was Done From The Hospital Digital Database Which Records All Patient Details. The Collected Data Were Grouped Based On The Patients Who Had Undergone Management Of Periapical Lesions. Gender Was Categorised Into Males And Females. Age Was Categorised Into 10 - 25 Years, 26 - 40 Years And 41 - 70 Years. The Data Were Entered In The System In A Methodical Manner. For This Study, Data On The Number Of Patients Underwent Treatment For Cleft Lip And Clinical Variables Such As Their Age And Gender And The Tooth Which Underwent Periapical Lesion Management Were Collected. The Data Was Then Entered In Excel Manually And Imported To Spss For Analysis. Incomplete Or Censored Data Were Excluded From The Study.

Statistical Analysis - The Statistical Analysis Was Done Using Spss Software (Spss Version 21.0, Spss, Chicago Ii, Usa). Descriptive Statistics Were Used To Summarise The Demographic Information Of The Patients Included In This Study. Descriptive Statistics Is Used For The Acquisition Of Frequency Distribution Of The Data. Chi Square Test Was Applied And Statistical Significance Was Kept At P<0.05.

Results And Discussion

The Study Population Consists Of 15 Participants Aged Between 10-70 Years. Majority Of The Study Population Were In The Age Group Of 10-25 Years (93.3%). Males (66.6%) Dominated The Study Population Than Females (13.3%). Based On The Age Distribution Of The Study Population, 93.3% Of The Patients Were Found Within The Age Group Of 10-25 Years; 6.7% Of The Patients Were Found Within The Age Group Of 41-70 Years; No Patients Were Found Within The Age Group Of 26- 40 Years (Figure 1).

Based On The Gender Wise Distribution Of The Study Population 66.6% Of The Patients Were Found To Be Males And 13.3% Of The Patients Were Found To Be Females.(Figure 2).Based On The Prevalence Of Number Of Teeth That Have Undergone Periapical Lesion Management, Maxillary Anteriors 11(33.3%), 21(26.6%), 22(13.3%), Mandibular Anterior 43(6.6%) And Mandibular Posteriors 36 (6.6%), 46(13.3%) Were Found To Undergo Periapical Lesion Management (Figure 3).

Based On The Association Of Age And Teeth That Underwent Periapical Lesion Management, The Maxillary Anterior 11(33.3%), 21(20%), 22(13.3%), Mandibular Anterior 43(6.6%) And Mandibular Posteriors 36(6.6%), 46(13.3%) Were Found To Undergo Periapical Lesion Management In Patients Of Age Group Between 10-25 Years. It Was Observed That The Maxillary Anterior 21(6.6%) Was Found To Undergo Periapical Lesion Management In Patients Of Age Group Between 41 - 70 Years (Figure 4). Based On The Association Of Gender With The Teeth That Underwent Periapical Lesion Management, Maxillary Anterior 11(20%), 21(26.6), 22(13.3%), Mandibular Anterior 43(6.6%) And Mandibular Posteriors 36(6.6%), 46(13.3%) Were Found To Undergo Periapical Lesion Management In Males. It Was Observed That The Maxillary Anterior 21(13.3%) Was The Only Tooth To Undergo Periapical Lesion Management In Females (Figure 5).

Epidemiological Investigations Have Demonstrated A High Prevalence Of Periapical Lesions In Many Western Countries. Prevalence From 30-60% And Increasing With Age Are Commonly Reported From Dutch, Portugal, Switzerland, United States And Other Countries [(Petersson, 1993)]. Data Reported From Scandinavia Shows The Prevalence Of Periapical Lesions In Root-Filled Teeth Ranging From 16 To 52.2% [(Lupi-Pegurier *Et Al.*, 2002),(Loftus, Keating And Mccartan, 2005)]. In The Current Study, The Prevalence Of Periapical Lesions In The Age Group Of 10-25 Years (80%) Was Found To Be High With Male (86.6%) Predominance. These Findings Were In Contrast To Al.Nazhan, Et Al [(Al-Nazhan *Et Al.*, 2017)] Who Found That The High Prevalence Of Periapical Lesions Were Seen In Females (57.7%) When Compared To Males (42.2%). Another Study Reported That Periapical Lesions Were Significantly Higher In Females (8.4%) Than In Males (4.75%) Which Is Found Similar To Alrahabi And Younes [(Merini *Et Al.*, 2017)]

In The Current Study, Periapical Lesion Treated Teeth Were Greater In The Maxilla (73.3%) When Compared With The Mandible (26.6%). This Is Consistent With Other Reports [(Kabak And Abbott, 2005),(Segura-Egea *Et Al.*, 2005)]. In The Present Study, The Maxillary Anterior Teeth() Were The Most Common Teeth Which Underwent Periapical Lesion Management Due To This Tendency Of Getting Injured Or Fractured During Trauma. But, This Is In Contrast To Al Nazhan, Et Al [(Balto *Et Al.*, 2005)] Who Says That Mandibular Molar Teeth Were The Most Common Treated Tooth (23.3%), Perhaps Due To This Early Eruption And The Anatomical Complexity Of The

Occlusal Surfaces Of Their Crowns [10]. Another Study Reports That The Maxillary Posterior Teeth Had More Root Canal Treatments, Which Agrees With Younes [(De Moor *Et Al.*, 2000)]

As In Previous Retrospective Studies [(Von Arx, Roux And Bürgin, 2014)], A Study Found Most Of The Teeth Treated By Periapical Surgery Were Maxillary Incisors [(Şimşek-Kaya Et Al., 2018)] Which Is Similar To Our Study Results This Is Understandable, Since Maxillary Teeth Appear To Undergo Conventional Root Canal Treatment More Often Than Mandibular Teeth. Another Study Says That The Central Incisors Were The Most Common Mandibular Teeth To Undergo Periapical Surgery. Our Institution Is Passionate About High Quality Evidence Based Research And Has Excelled In Various Fields ((Pc, Marimuthu And Devadoss, 2018; Ramesh Et Al., 2018; Vijayashree Priyadharsini, Smiline Girija And Paramasivam, 2018; Ezhilarasan, Apoorva And Ashok Vardhan, 2019; Ramadurai Et Al., 2019; Sridharan Et Al., 2019; Vijayashree Priyadharsini, 2019; Chandrasekar Et Al., 2020; Mathew Et Al., 2020; R Et Al., 2020; Samuel, 2021)Given That An Uncleaned Second Canal May Be Responsible For Failure Of Conventional Root Canal Treatment In Mandibular Incisors [(El-Swiah And Walker, 1996)], This Finding Highlights The Need For Clinicians To Investigate The Condition Of Both Canals When Performing Conventional Treatment Of Mandibular Incisors. It Is Acknowledged That Some Of The Limitations Such As Smaller Sample Size And Limited Demography Could Have Affected The Results.

Conclusion

Within The Limitations Of The Current Study , It Was Observed That A Higher Prevalence Of Teeth That Have Undergone Periapical Lesion Management Were Found Within The Age Group Of 10 - 25 Years With Male Predominance. It Was Also Observed That High Prevalence Of Periapical Lesion Management Was Performed In Maxillary Central Incisors. But Still Further Studies With Large Populations Are Needed To Associate Our Findings With Other Regions.

Acknowledgement

This Research Was Supported By Saveetha Dental College And Hospital. We Thank The Department Of Conservative And Endodontics, Saveetha Dental College For Providing Insight And Expertise That Greatly Assisted This Research.

Conflict Of Interest

The Authors Declare That There Is No Conflict Of Interests.

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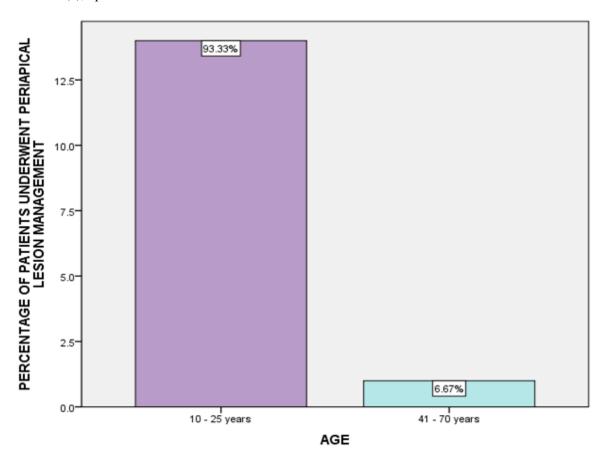


Figure 1:Bar Chart Represents The Distribution Of The Study Population By Age. The X Axis Denotes The Age Group Of The Patients Underwent Periapical Lesion Management And The Y Axis Denotes The Percentage Of Patients Underwent Periapical Lesion Management. From The Graph, It Is Observed That The Incidence Of Patients Who Had Undergone Periapical Lesion Management Is More In The Age Group Of 10 - 25 Years (93.3%) When Compared To Other Age Groups.

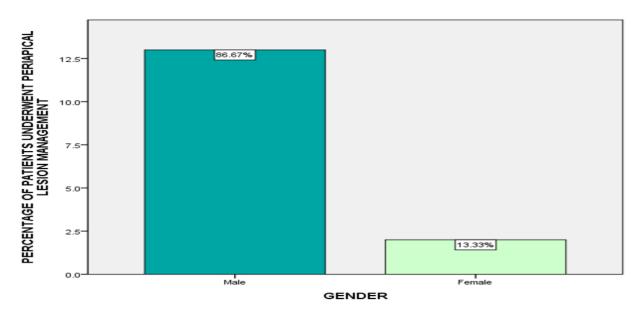


Figure 2: Bar Chart Represents The Gender Distribution Of The Study Population. The X Axis Denotes The Gender Of The Patients Undergone Periapical Lesion Management And The Y Axis Denotes The Number Of Patients Undergone Periapical Lesion Management. From The Graph It Is Observed That The Incidence Of Patients Undergoing Periapical Lesion Management Is More Prevalent Among Males(66.6%) When Compared To Females(13.3%).

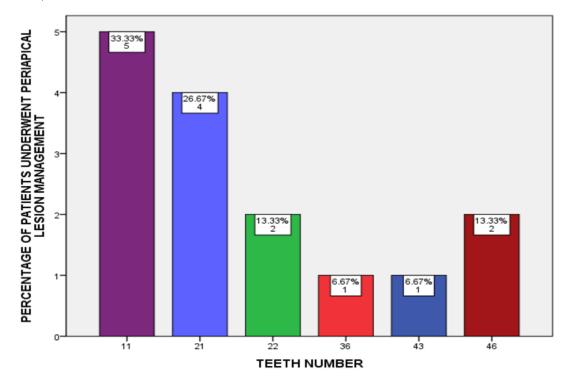


Figure 3: Bar Chart Represents The Prevalence Of Teeth That Have Undergone Periapical Lesion Management. The X Axis Denotes The Teeth Number Of The Patients And Y Axis Denotes The Number Of Patients Undergone Periapical Lesion Management. From The Graph, It Is Observed That A Higher Prevalence Of Maxillary Right Central Incisor (33.3%) Followed By Maxillary Left Central Incisor (26.7%) When Compared To Other Teeth.

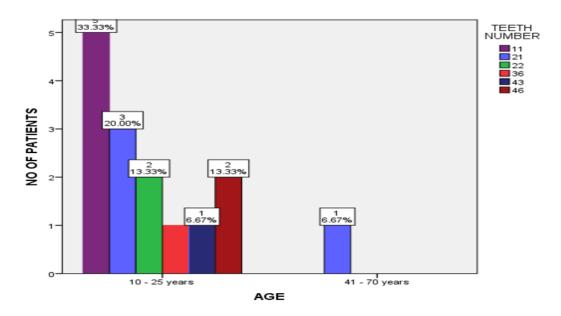


Figure 4: Bar Chart Represents The Association Between The Age And Number Of Teeth That Underwent Periapical Lesion Management. The X Axis Denotes The Age Group Of The Patients And The Y Axis Denotes The Number Of Patients Undergone Periapical Lesion Management. From The Graph, It Is Observed That The Majority Of The Teeth That Have Undergone Periapical Lesion Management Were Found Within The Age Group Of 10 - 25 Years. It Is Observed That A Higher Prevalence Of Maxillary Left Central Incisor (33.3%) Followed By Maxillary Right Central Incisor (20%) Was Seen Within The Age Group Of 10 - 25 Years. However, It Is Statistically Not Significant. (Chi-Square Test, P Value- 0.708 (P > 0.05 Which Is Statistically Not Significant))

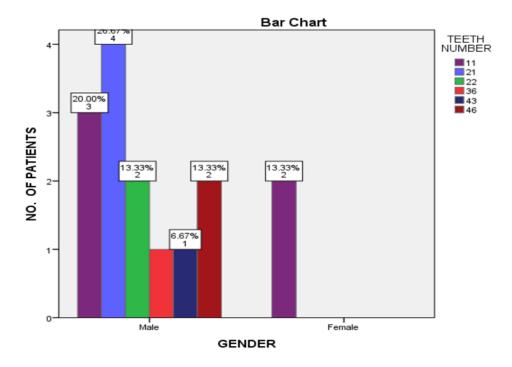


Figure 5: Bar Chart Represents The Association Between The Gender And Number Of Teeth That Underwent Periapical Lesion Management. The X Axis Denotes The Gender Of The Patients And The Y Axis Denotes The Number Of Patients Undergone Periapical Lesion Management. From The Graph, It Is Observed That The Majority Of The Teeth That Have Undergone Periapical Lesion Management Were Found In Females When Compared To Males. It Is Observed That A Higher Prevalence Of Maxillary Right Central Incisor (26.6%) Followed By Maxillary Left Central Incisor (20.%) Was Seen In Females. However, It Is Statistically Not Significant. (Chi-Square Test, P Value- 0.465 (P > 0.05 Which Is Statistically Not Significant))