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## Assessment of Tooth Mobility in Periodontitis Patients Below the Age Of 35 Years - An Institutional Based Retrospective Study

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**Abstract:** Tooth mobility is the degree of displacement of the tooth from the socket on the application of force. It is an important clinical feature in the diagnosis of periodontal diseases. The aim of the study was to assess the tooth mobility in periodontitis patients under the age of 35 visiting a private dental institution. This was a retrospective study. Samples were collected from June 2019 to March 2020. Data of the periodontal status of patients visiting a private dental institution in the age group of 18 to 35 years were collected. Excel tabulation was done and SPSS results were obtained. In this study, it was shown that 1993 patients were diagnosed with periodontal diseases. Among those patients, 1676 patients were diagnosed with localized chronic periodontitis, 302 patients were diagnosed with generalized chronic periodontitis, 10 patients were diagnosed with localized aggressive periodontitis and 5 patients were diagnosed with generalized aggressive periodontitis. Among patients with mobility, 82% had Grade 1 mobility, 13% had Grade 2 mobility and 5% had Grade 3 mobility. From the present study, we can conclude that Grade 1 mobility was seen more in all the age groups when compared to Grade 2 and Grade 3 mobility. It was also found that Grade 1 mobility was predominantly seen in the age group of 25-30 years. The association of tooth mobility in different age groups was found to be statistically significant (p value- 0.023). Grade 1 mobility was more common in male patients. Grade 1 mobility was more common in localized chronic periodontitis patients. The association of tooth mobility with respect to different types of periodontal diseases was found to be statistically significant (p value- 0.004). Localized chronic periodontitis was seen more commonly among all age groups but predominantly in the age group of 25-30 years. The association of different types of periodontal diseases in different age groups was found to be statistically significant (p value- 0.01). Localized chronic periodontitis was seen more commonly in male patients when compared to other types of periodontal diseases. The key to successful management of periodontal disease at younger age patients lies in early diagnosis of the disease and rigorous treatment employing the different treatment modalities followed by meticulous lifelong maintenance therapy.

**Keywords:** Generalized aggressive periodontitis, Generalized chronic periodontitis, Localized aggressive periodontitis, Localized chronic periodontitis, Tooth mobility.

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### INTRODUCTION

Periodontal diseases are inflammatory diseases of the oral cavity, which can also affect the attachment of the tooth to the alveolar bone (Albandar and Rams, 2002). The occurrence of periodontal diseases in humans is always a global problem. Age, gender, oral hygiene practices and smoking are the most common risk factors. They can affect the initiation, progression and severity of periodontitis (Tanik, 2019). There are two types of periodontitis: chronic periodontitis and aggressive periodontitis. They are further divided into localized and generalized. Chronic periodontitis is more common in adults, while aggressive periodontitis may be more common in children and adolescents (Armitage, 1999). Localized aggressive periodontitis occurs in children and adolescents without evidence of systemic disease. It is characterised by severe loss of alveolar bone around permanent teeth and the disease is localized to the first molars and incisors.

Periodontal disease is found to affect male sex more than the female sex (Hyman and Reid, 2003; Kocher *et al.*, 2005; Bouchard *et al.*, 2006). The most important feature of periodontitis is tooth mobility. Tooth mobility is

mild displacement of the tooth from its socket. According to Miller's tooth mobility index, mobility was classified as Grade 1 mobility, Grade 2 mobility and Grade 3 mobility (Miller, 1938). Grade 2 mobility and grade 3 mobility will usually have a poor prognosis. Tooth mobility causes inflammatory disruption of periodontal tissues, widening of periodontal ligament space, attachment loss, alveolar bone loss and occlusal trauma. Tooth mobility results in occlusal instability, masticatory disturbances and impaired quality of life (Gajendran, Parthasarathy and Tadepalli, 2018).

Periodontitis is a multifactorial disease with primary etiological factors being plaque and microflora (Ramesh, Sheeja S. Varghese, *et al.*, 2016). The difficulty in maintaining oral hygiene leads to further plaque accumulation and inflammation, the presence of previous inflammatory factors like cytokines, TNF - alpha, endothelins and IL-21 favours the action on the gingival connective tissue, perpetuating this cycle. (Varghese *et al.*, 2015; Khalid *et al.*, 2016, 2017; Mootha *et al.*, 2016; Agrawal *et al.*, 2017; Priyanka *et al.*, 2017)

Periodontitis impedes proper dental hygiene and apart from cosmetic disfigurement, ensures painful chewing and eating, maintenance of oral hygiene and prevention of periodontal diseases can be done by using chlorhexidine, herbal mouthwashes (Ramesh, Sheeja Saji Varghese, *et al.*, 2016; Ramamurthy and Mg, 2018; Ramesh *et al.*, 2019). The treatment of periodontitis is a multidisciplinary approach, starting from synthetic drugs like antibiotics to regenerative methods (Ramesh, Ravi and Kaarthikeyan, 2017; Ravi, Malaippan and Varghese, 2017) like PRF (Panda *et al.*, 2014; Thamaraiselvan *et al.*, 2015) growth factors and stem cells. (Avinash, Malaippan and Dooraiswamy, 2017) (Kavarthapu and Thamaraiselvan, 2018). Our department is passionate about research we have published numerous high quality articles in this domain over the past years ( (Kavitha *et al.* 2014) , (Praveen *et al.* 2001), (Devi and Gnanavel 2014), (Putchala *et al.* 2013), (Vijayakumar *et al.* 2010), (Lekha *et al.* 2014b, [a] 2014) (Danda 2010) (Danda 2010) (Parthasarathy *et al.* 2016) (Gopalakannan, Senthilvelan, and Ranganathan 2012), (Rajendran *et al.* 2019), (Govindaraju, Neelakantan, and Gutmann 2017), (P. Neelakantan *et al.* 2015), (PradeepKumar *et al.* 2016), (Sajan *et al.* 2011), (Lekha *et al.* 2014b), (Prasanna Neelakantan, Grotra, and Sharma 2013), (Patil *et al.* 2017), (Jeevanandan and Govindaraju 2018), (Abdul Wahab *et al.* 2017), (Eapen, Baig, and Avinash 2017), (Menon *et al.* 2018), (Wahab *et al.* 2018), (Vishnu Prasad *et al.* 2018), (Uthrakumar *et al.* 2010), (Ashok, Ajith, and Sivanesan 2017), (Prasanna Neelakantan *et al.* 2015). The aim of the present study is to assess the tooth mobility in periodontitis patients under the age of 35.

## MATERIALS AND METHODS

A retrospective study was conducted in Saveetha Dental College, Chennai. Before scheduling the retrospective study, the official permission was obtained from the Institutional ethical committee (ethical approval number - SDC/SIHEC/2020/DIASDATA/0619-0320).

### Inclusion and exclusion criteria

Male and female patients in the age group of 18 to 35 years, patients with chronic and aggressive periodontitis were included in the study. Patients above the age of 35 years, patients who had a history of periodontal treatment and patients with smoking habits and systemic diseases were excluded from this study.

### Data collection

Data of the periodontal status of patients visiting a private dental institution in the age group of 18 to 35 years were collected. Sample size was 1993 patients. It was cross verified with another examiner. Sampling bias was minimised by including all available data and no sorting process. Demographic details such as patient identity number (PID.No), age and sex were recorded. Based on the severity of periodontal disease the patients were categorised into localised and generalised chronic periodontitis, localised and generalised aggressive periodontitis. The grading of tooth mobility was assessed based on Miller's classification (1985) and it was entered as grade 1, grade 2 and grade 3. Data was entered in a methodological manner. Incomplete data were excluded from the study.

### Statistical Analysis

Excel tabulation was done. SPSS importing was done. Data was analyzed using SPSS software (IBM SPSS Statistics, Version 24.0, Armonk, NY: IBM Corp]. Chi-square test was performed to find the association between the variables. The level for a statistical significance was set at  $p < 0.05$ . The results were demonstrated in the form of bar graphs.

## RESULTS AND DISCUSSION

In this present study, Figure 1 showed that among patients with types of periodontal diseases, 84% were diagnosed with localized chronic periodontitis, 15.1% were diagnosed with generalized chronic periodontitis, 0.5% were diagnosed with localized aggressive periodontitis and 0.2% were diagnosed with generalized aggressive periodontitis. The frequency of localized chronic periodontitis was more when compared to other

types of periodontal diseases. Figure 2 shows that Grade 1 mobility (82%) was seen more than Grade 2 (13%) and Grade 3 mobility (5%) in younger patients.

Figure 3 shows the association of tooth mobility in different age groups. Grade 1 mobility was seen more commonly in all the age groups but predominantly in the age group of 25-30 years with the percentage of 49%. P value was found to be statistically significant (0.023). Figure 4 shows the association of tooth mobility with respect to gender. Grade 1 mobility was more common in male patients when compared to females but there was no statistically significant difference between the genders.

Figure 5 shows the association of different types of periodontal diseases in different age groups. Localized chronic periodontitis was seen more commonly among all age groups but predominantly in the age group of 25-30 years with the percentage of 52%. P value was found to be statistically significant (0.01). Figure 6 shows the association of different types of periodontal diseases with respect to gender. Localized chronic periodontitis was seen more commonly in male patients (53%) than in female patients (31%). Generalized chronic periodontitis was also seen more in male patients (10.39%). P value was found to be statistically insignificant (0.213). Figure 7 shows the association of tooth mobility with respect to different types of periodontal diseases. Grade 1 mobility was seen more commonly in localized chronic periodontitis with the percentage of (49%). Mobility in aggressive periodontitis was found to be very less (1.36%). P value was found to be statistically significant (0.004).

A total of 1993 patients participated in the present study. There were various studies considering the tooth mobility in elderly adults, so our study mainly focussed on the tooth mobility in younger patients. In the study done by Helmi.et.al, older age groups have higher risk and proportion of periodontal diseases compared to younger age groups (Helmi *et al.*, 2019). In the study done by Choi.et.al, tooth mobility was found to be one of the main symptoms of periodontal diseases after the age group of 40 years (Choi, 2019). In the present study, 84% were diagnosed with localized chronic periodontitis, 15.1% were diagnosed with generalized chronic periodontitis, 0.5% were diagnosed with localized aggressive periodontitis and 0.2% were diagnosed with generalized aggressive periodontitis. The frequency of localized chronic periodontitis was more when compared to other types of periodontal diseases. Even though the prevalence of aggressive periodontitis is much lower than chronic periodontitis, the management of aggressive periodontitis is more challenging compared to that of chronic periodontitis because of its strong genetic predisposition as an unmodifiable risk factor.

Grade 1 mobility (82%) was seen more than Grade 2 (13%) and Grade 3 mobility (5%) in younger patients in the current study, Also Grade 1 mobility was seen more commonly in all the age groups but predominantly in the age group of 25-30 years with the percentage of 49% The association of tooth mobility with different age groups was found to be statistically significant. Tooth mobility is one of the terminal presentations of periodontal disease before tooth loss. The adoption of proper and adequate steps in the management of tooth mobility will help in increasing the longevity of the teeth and prevent edentulism. Occlusal adjustment and splinting is usually enough to re-establish function, especially in cases of grade 1 and 2 tooth mobility. In the present study, grade 1 mobility was more common in male patients when compared to females, but there was no statistically significant difference between the genders. In the study done by Azodo.et.al, gender differences were noted among the patients with a female predilection. Increasing age and hormonal changes which results in adverse reactions in bones may have tilted females towards higher predisposition for tooth mobility (Azodo and Ogbebor, 2017). It was contradictory to our study. Because in our study, grade 1 mobility was seen more in male patients than in female patients. Mobility < 1mm in the horizontal direction is considered to be Grade 1 mobility (Miller's classification). In the study done by Peeran.et.al, there was an unequal distribution of males and females (Peeran *et al.*, 2012).

In the present study, Localized chronic periodontitis was seen more commonly among all age groups but predominantly in the age group of 25-30 years with the percentage of 52%. This association of different types of periodontal diseases in different age groups was found to be statistically significant. In the study done by Peeran.et.al, the presence of shadow pockets which is an indication of the deterioration of periodontium was more prevalent in the age group of 25 years and above (Peeran *et al.*, 2012). In the present study, Localized chronic periodontitis was seen more commonly in male patients (53%) than in female patients (31%). Generalized chronic periodontitis was also seen more in male patients (10.39%). This association of different types of periodontal diseases with respect to gender was found to be statistically insignificant. In the study done by Robo et.al, males showed more susceptibility to periodontal diseases due to smoking habits (Robo *et al.*, 2017). The results were very much relevant to our study. Even in our study, periodontal diseases were more prevalent in male patients in the age group of 25 to 30 years.

Grade 1 mobility was seen more commonly in localized chronic periodontitis (49%). Mobility in aggressive periodontitis was found to be very less (1.36%). The association of tooth mobility with respect to different types of periodontal diseases was found to be statistically significant. Study by Ainamo.et.al, revealed a significant association between age and prevalence, severity and extent of periodontitis, as well as the resultant tooth mobility and/or tooth loss (Ainamo and Ainamo, 1996). Study by Wang.et.al reported that age was statistically significantly associated with grades of tooth mobility (Wang *et al.*, 2007). Study by Heitz.et.al showed that the

relation between age and the prevalence and severity of periodontal disease could probably be the result of accumulation of periodontal destruction over the course of time, rather than the effect of the increasing age (Heitz-Mayfield, 2005). The limitations were small sample size because it does not provide results of the entire population. Future studies can be done with the larger population and by considering other factors like adverse oral habits and systemic diseases.

## CONCLUSION

From the present study, we can conclude that Grade 1 mobility was seen more in all the age groups when compared to Grade 2 and Grade 3 mobility. It was also found that Grade 1 mobility was predominantly seen in the age group of 25-30 years. Grade 1 mobility was more common in male patients and in localized chronic periodontitis patients. Localized chronic periodontitis was seen more commonly among all age groups but predominantly in the age group of 25-30 years. Localized chronic periodontitis was seen more commonly in male patients when compared to other types of periodontal diseases. The key to successful management of periodontal disease at younger age patients lies in early diagnosis of the disease and rigorous treatment employing the different treatment modalities followed by meticulous lifelong maintenance therapy.

## Author Contributions

First author (B. John Rozar Raj) performed the analysis, interpretation and wrote the manuscript. Second author (Dr. Balaji Ganesh.S) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Niveditha.M.S) participated in the study and reviewed the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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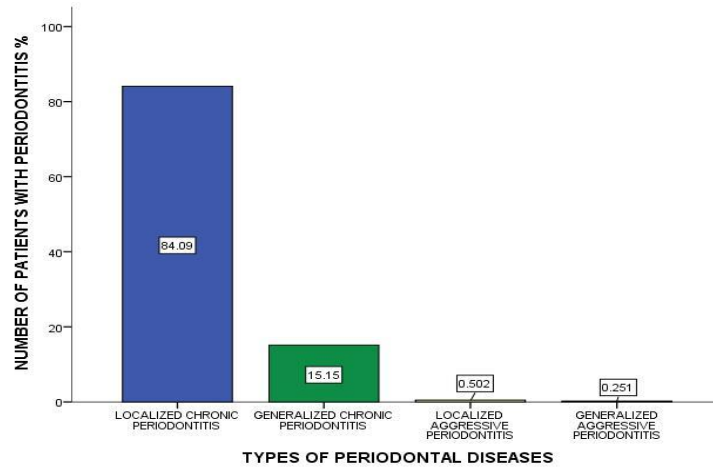
## Conflicts of Interest

The authors declare no conflicts of interest.

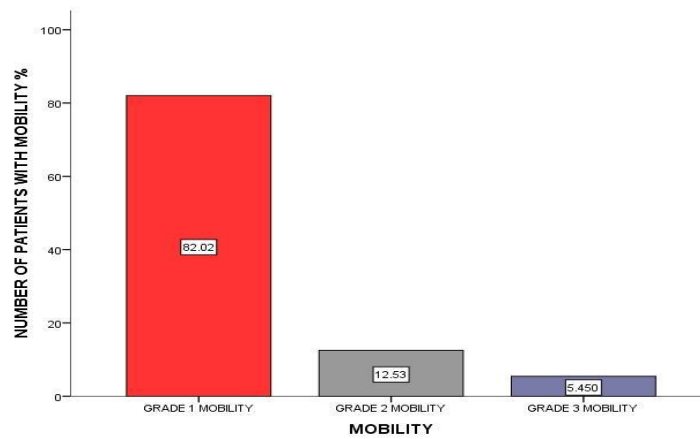
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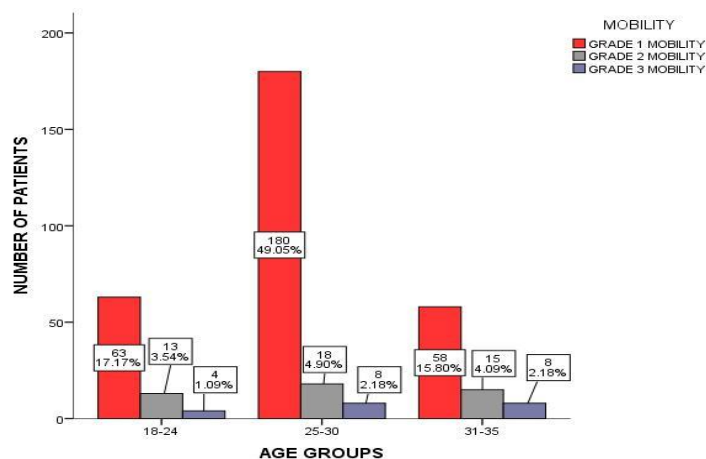
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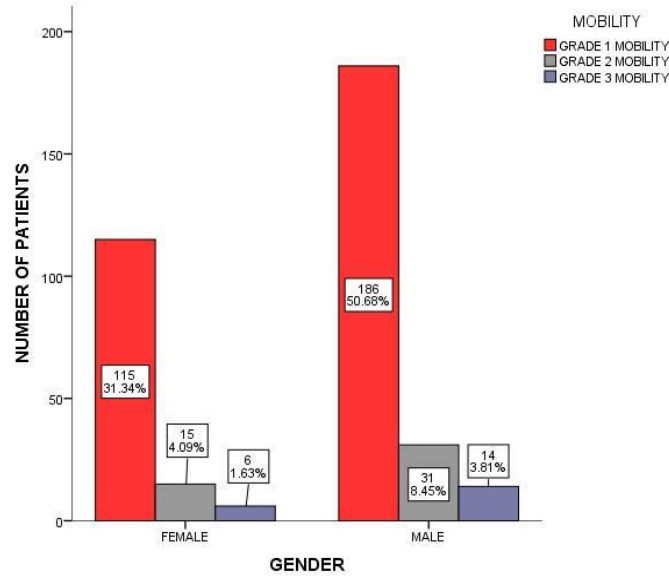
**Fig.1:** Bar chart depicts the frequency of different types of periodontal diseases. X-axis denotes the types of periodontal diseases. Y-axis denotes the number of patients with periodontitis. Localized chronic periodontitis (Blue) was seen more when compared to other types of periodontal diseases.



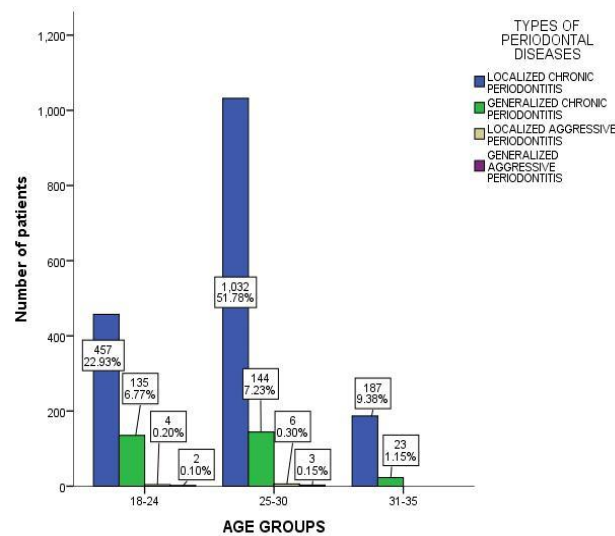
**Fig.2:** Bar chart depicts the frequency of tooth mobility. X-axis denotes the grades of mobility. Y axis denotes the number of patients with tooth mobility. Grade 1 mobility (Red) was seen more commonly than grade 2 and grade 3 mobility in younger patients.



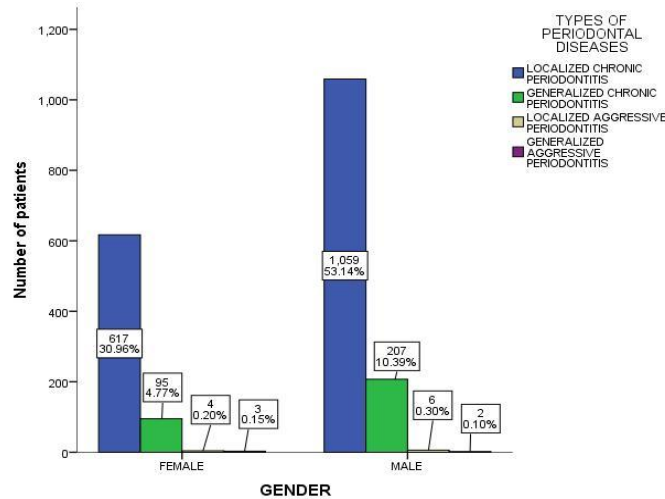
**Fig.3:** Bar chart depicts the association of tooth mobility in different age groups. X-axis denotes the age groups. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically significant, Pearson chi square, p value- 0.023; (<0.05). Grade 1 mobility (Red) was the most common in the age group of 25-30 years and there was a statistically significant difference among various age groups.



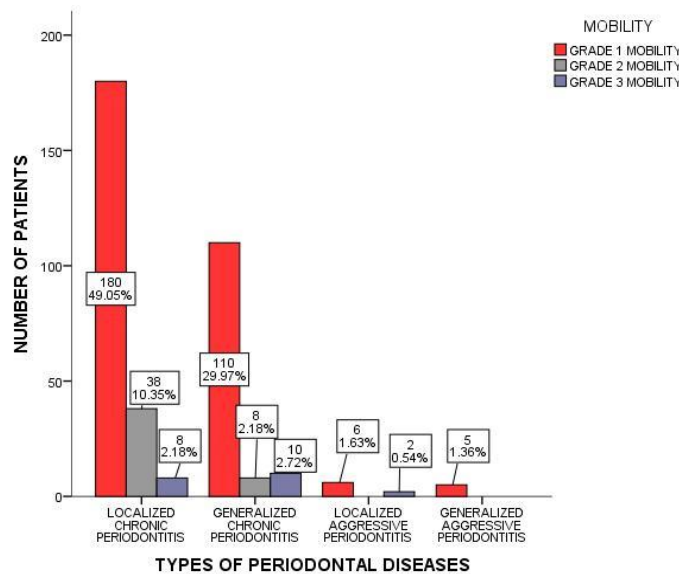
**Fig.4:** Bar chart depicts the association of tooth mobility with respect to gender. X-axis denotes gender. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically not significant, Pearson chi square, p value- 0.610; (>0.05). Grade 1 mobility (Red) was more common in male patients but there was no statistically significant difference between the genders.



**Fig.5 :** Bar chart depicts the association of different types of periodontal diseases in different age groups. X-axis denotes the age groups. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically significant, Pearson chi square, p value-0.01; (<0.05). Localized chronic periodontitis (Blue) was seen more commonly in the age group of 25-30 years and there was a statistical significant difference among various age groups.



**Fig.6:** Bar chart depicts the association of different types of periodontal diseases with respect to gender. X-axis denotes gender. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically not significant, Pearson chi square, p value- 0.213; (>0.05). Localized chronic periodontitis (Blue) was seen more commonly in male patients but there was no statistical significant difference between the genders.



**Fig.7:** Bar chart depicts the association of tooth mobility with respect to different types of periodontal diseases. X-axis denotes the types of periodontal diseases. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically significant, Pearson chi square, p value-0.004; (<0.05). Grade 1 mobility (Red) was seen more commonly in localized chronic periodontitis and there was a statistically significant difference of tooth mobility with respect to different types of periodontal diseases.