Tooth mobility pattern in periodontitis patients with diabetes mellitus

Study design: Retrospective study

ABSTRACT

Background: Tooth mobility may be a common problem among patients seeking dental treatment. Tooth mobility is defined as an extent of horizontal and vertical tooth displacement created by external forces, trauma and periodontal diseases.
Aim: The aim of the present study is to evaluate the pattern of tooth mobility in patients with diabetes mellitus.
Materials and methods: The case sheet records (DIAS data) of tooth mobility in diabetic patients were extracted. A total of 1568 case sheets were analysed for the study. Age, gender and pattern of tooth mobility with respect to the region were collected and statistically analysed using SPSS statistical software. Descriptive statistics (percentage, mean, SD) and inferential test (Chi square test) were performed to determine the association between age, gender and region of tooth mobility in diabetes mellitus patients.
Results: Results showed that tooth mobility was more common among males when compared to females. According to age, patients between 41 to 50 years with diabetes mellitus were more affected by tooth mobility. Tooth mobility was more commonly seen in the mandibular anterior region.
Conclusion: The present study showed a possible relationship between diabetes mellitus and tooth mobility. Results showed that 80% of patients with diabetes mellitus had tooth mobility. Therefore, early diagnosis, preventive therapeutic measures and oral hygiene reinforcement is needed to prevent progression of periodontal disease leading to tooth mobility.

Keywords: Diabetes Mellitus, novel method; periodontitis, tooth mobility, periodontal disease

1. INTRODUCTION

Physiological tooth mobility is defined as a slight displacement of the clinical crown of the tooth that is allowed by the resilience of an intact and healthy periodontium, under the application of moderate force [1] . Tooth mobility can cause occlusal instability, improper mastication and impaired quality of life [2]. Assessment of tooth mobility is an important part of periodontal assessment, because tooth mobility is a major sign in diagnosis of periodontal disease [2,3].

Miller's tooth mobility index graded the tooth mobility from I to III [4]. The mechanisms of periodontitis mainly involved to cause tooth mobility are inflammatory disruption of periodontal tissues [5], widening of periodontal ligament, loss of attachment, horizontal or vertical loss of alveolar bone and trauma from occlusion [6]. Tooth mobility can occur as a result of secondary trauma as the destruction of tissue occurs in the presence of normal occlusal forces in teeth with weakened supporting tissues [7]. Factors that result in tooth mobility are abnormality in crown root ratio [7,8], shape and length of root, structural abnormality of tooth and periodontal disease [9,10]. The initial signs of tooth mobility as shared by patients are tenderness on mastication followed by pain or sudden displacement of tooth [11]. Displacement of anterior teeth will affect aesthetic appearance [12,13].

Chronic periodontitis is an advanced form of periodontal disease causing destruction of both soft tissue and hard tissue components of tooth supporting structures resulting in tooth mobility [14]. The adoption of proper and adequate steps in the management of tooth mobility will definitely help in increasing the longevity of teeth and preventing tooth loss [15] . The aim of the present study is to evaluate the pattern of tooth mobility in diabetic patients with periodontal disease.

Our team has extensive knowledge and research experience that has translate into high quality publications.[16–28],[29–33] [34] [35]

2. MATERIALS AND METHODS

The data comprising demographic details and tooth mobility in diabetes mellitus patients were collected from the duration of June 2019 to April 2020. A total of 1568 case sheets were analysed. The samples were collected by a simple random sampling method. Cross verification of data was done. FDI tooth numbering system was followed in the study. Incomplete datas was excluded. The analysis was done using SPSS version 19. Dependent variables are the number of mobile teeth and independent variables are age and gender. The data was statistically analysed using Chi-square test. The level of significance was set at 0.05.

3. RESULT AND DISCUSSION

100 diabetic patients diagnosed with periodontal disease were studied. The study sample consisted of 48.5% females and 51.5% males. The proportion of males was greater than the females [Figure 1]. Majority of the participants were in the age group between 51-60 years (31.3%) [Figure 2]. 49% of the mobile teeth were present in both anterior and posterior regions, 30% were present in the anterior region and 20% of the mobile teeth were present in the posterior region. Thus the results showed that tooth mobility was more commonly seen in the anterior region [Figure 3]. Mobile teeth were present in the mandibular arch (36.3%) than the maxillary arch (13%) [Figure 4]. Majority of the patients had tooth mobility in the anterior region (30.3%) than other regions. Most of the male patients had mobile teeth in both regions (28%) compared to female patients (21%), however it was statistically not significant ($p>0.05$) [Figure 5]. The patients in the age group of 51-60 years present with a higher number of mobile teeth in both anterior and posterior regions (31%) ($p>0.05$) [Figure 6]. Tooth mobility was more commonly seen in the mandibular arch than the maxillary arch and more common among males (51.5%) than females [Figure 7]. Mobile teeth were observed in patients in the age group of 51-60 years more commonly seen in the mandibular region (36.6%) than the maxillary region. However, this is statistically not significant [Figure 8].

Tooth mobility is a common problem among patients seeking dental health attention with the presenting complaints of mobile teeth, painful teeth and shaking teeth [36]. The high chance of tooth mobility in this study was related to chronic periodontitis [37,38]. Tooth mobility may be associated with various factors of periodontal disease [39] among patients in relation to age, gender, irregular dental check up, chronic medical condition and poor oral hygiene [40] .In this present study, males (51.5%) with mobile teeth and females (48.5%) with mobile teeth coincides with the previous study performed by Henry et al in 2017 [41]he habit of smoking was thought to be a reason behind the increased susceptibility of males with tooth mobility. The results of this study showed that the tooth mobility was highest in the fifth and sixth decades with a peak incidence of 51-60 years (31.3%). This study coincided with Azado et al in 2017 reported that tooth mobility to be one of the main symptoms of periodontal disease after the age of 40 years. The possible explanation for the difference is due to the effect of increasing age, there could be a destruction of periodontium, loss of alveolar bone, loss of attachment and malnutrition [42].

Tooth mobility in the anterior region (30%) more than the posterior region (20%). This finding is similar to a study proposed by Muhlemann HR et al in 1960, he stated single rooted teeth have a higher tooth

mobility measurement than the multirooted teeth [43]results of the present study showed tooth mobility in the mandibular arch (36%), maxillary arch (13.3%) and both maxillary and mandibular arch (50.5%). Tooth mobility was more commonly seen in the mandibular arch. This result contradicts the finding of Giannakoura et al in 2019 [14] , which reported that the maxillary arch showed more tooth mobility than the mandibular arch. The possible explanation of the difference is occlusal trauma and primary tooth exfoliation [44].

In the present study gender and age was not significantly associated with tooth mobility. The present study is important to raise clinicians awareness in the appropriate way of managing tooth mobility. It is very important to properly diagnose the cause of a particular pattern of tooth mobility. The present study had geographic limitations, small sample size and also other confounding factors were not studied. The future scope of the study is to implement preventative therapeutic measures, emphasize oral hygiene in the mandibular anterior region and awareness programs for patients with periodontal diseases.

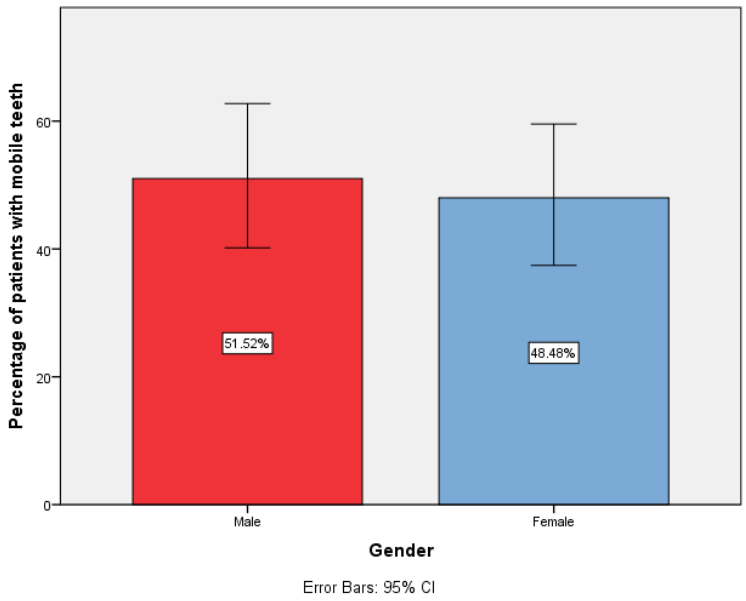

Fig. 1. Bar graph showing the gender distribution of patients. X-axis represents gender and Y-axis represents the percentage of patients. 51.5% of the patients are males (red) and 48.4% are females (blue).

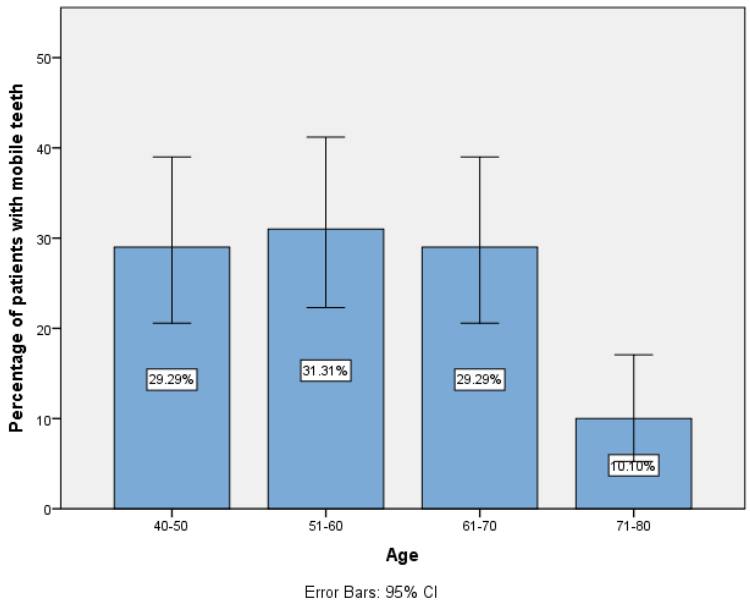

Fig. 2. Bar graph showing the distribution of the age group of the study participants. X axis represents the patient age group and Y axis represents the percentage of patients. Majority of the patients are in the age group of 51-60 years (31.3%)

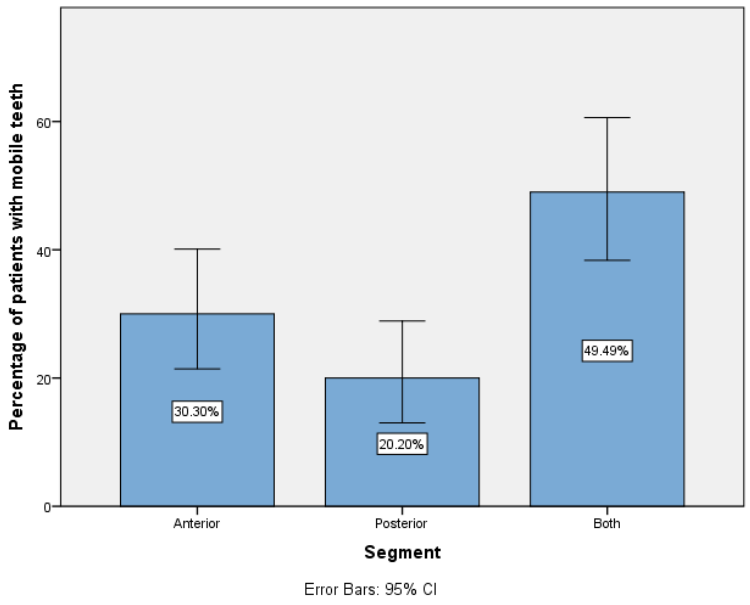

Fig. 3. Bar graph showing the distribution of location of tooth mobility. X axis represents the location of the tooth mobility (anterior, posterior, both) and Y axis represents the percentage of patients with periodontal diseases. Mobile teeth were more commonly seen in the anterior region (30.3%).

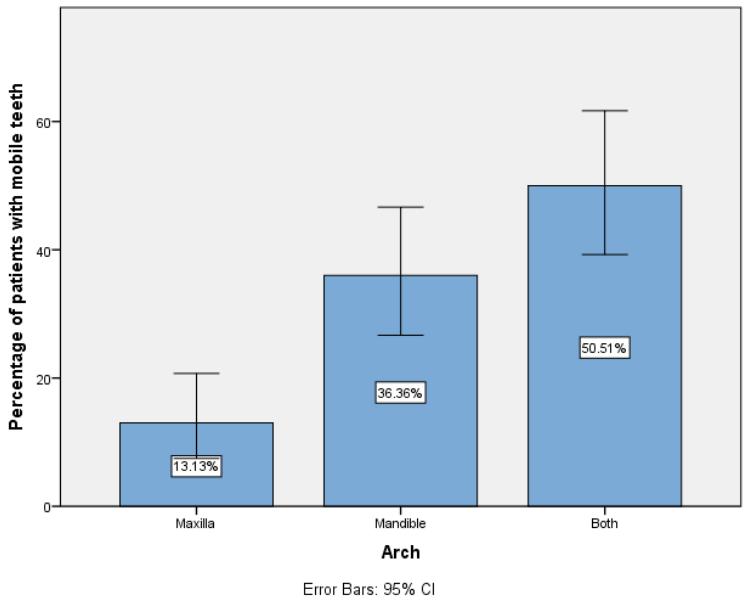

Fig. 4. Bar graph showing the distribution of the region of the tooth mobility. X axis represents the region of tooth mobility (maxillary, mandibular, both) and Y axis represents percentage of patients with periodontal diseases. Mobile teeth were more common in the mandibular arch (36.3%) than the maxillary arch (13.3%).

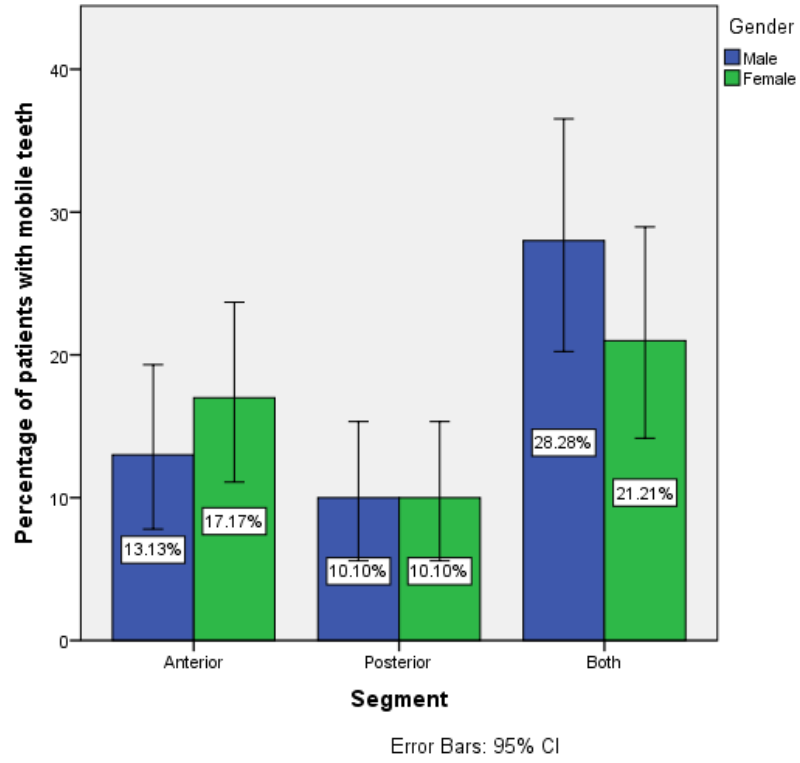

Fig. 5. Bar graph representing the association of gender and location of mobile teeth. X axis represents the location of the mobile teeth and Y axis represents the number of patients who had tooth mobility. Majority of the male patients (blue) had tooth mobility in the anterior and posterior region than female patients (green).

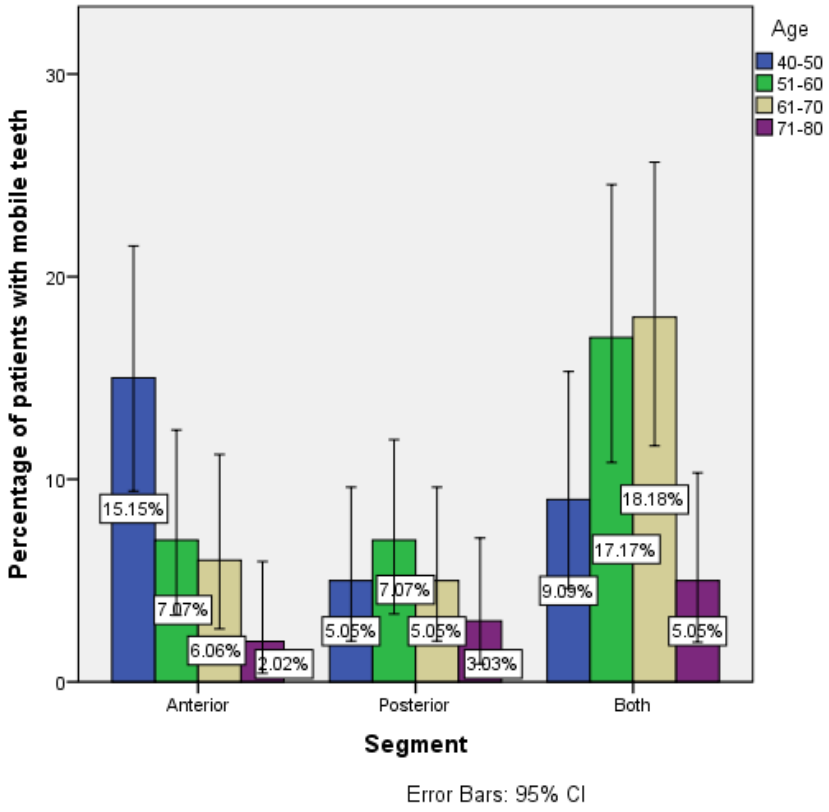

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Fig. 6. Bar graph representing the association of age group and location of mobile tooth. X-axis represents the location of the mobile tooth and Y-axis represents the number of patients who had tooth mobility, The patients in the age group of 51-60 years presents with a higher number of mobile teeth in both anterior and posterior regions.

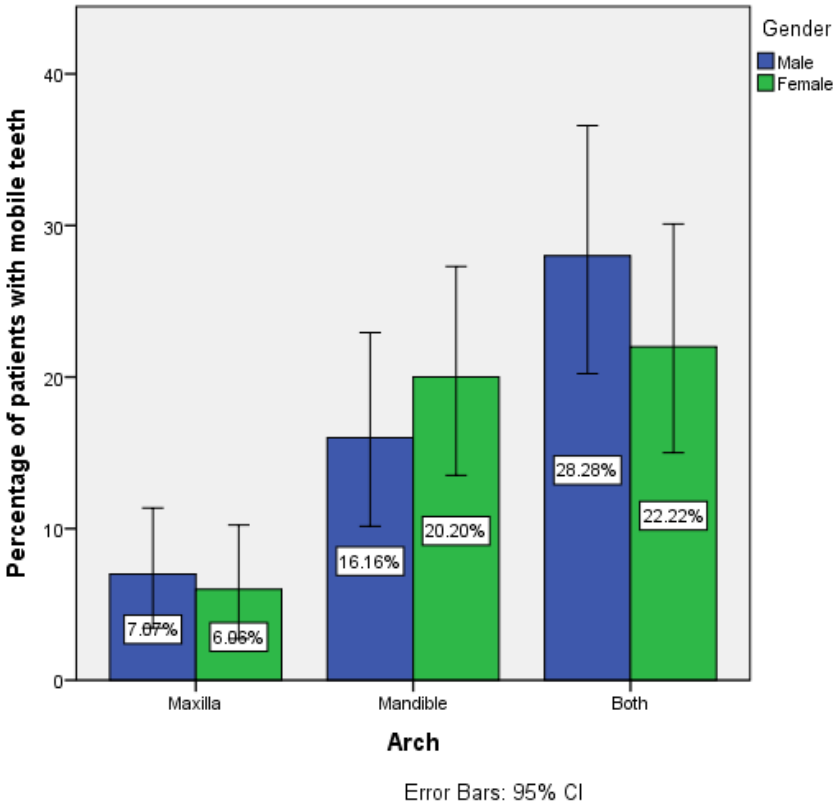

Fig. 7. Bar graph representing the association of gender and region of tooth mobility. X axis represents the region of the mobile tooth (Jaws involved) and Y axis shows the number of patients who had tooth mobility. Tooth mobility is more commonly seen in mandibular arch than the maxillary arch and more common among males (blue) than females (green).

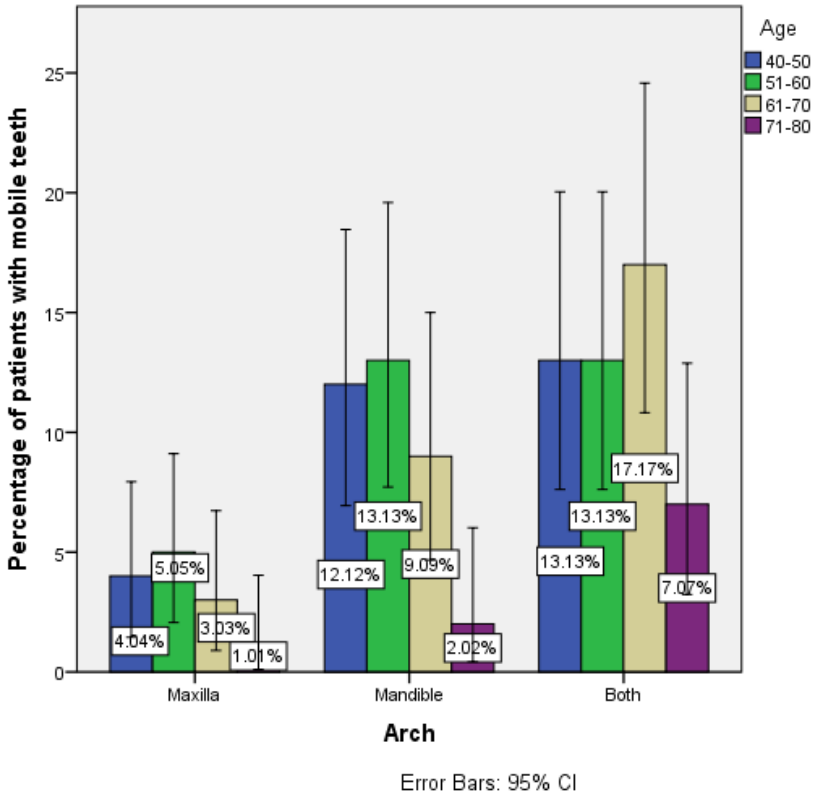

Fig. 8. Bar graph representing the association of age group and region of tooth mobility. X axis represents the region of the mobile tooth and Y axis represents the number of patients. Patients in the age group of 51-60 years present with higher number of tooth mobility and more commonly in the mandibular region than maxillary region.

4. CONCLUSION

Therefore, from this study, the pattern of tooth mobility in diabetic patients with periodontal disease was analysed. Patients' age, gender, site and region of mobile tooth are not associated with tooth mobility. Tooth mobility due to periodontal disease can occur equally in both male and females. The present study showed that 80% of the diabetic patients with periodontal disease had tooth mobility. Therefore, early diagnosis, preventive therapeutic measures are needed to prevent progression of periodontal disease which leads to tooth mobility and tooth loss.

Ethical Approval:

As per international standard or university standard ethical approval has been collected and preserved by the authors.

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