

# Frequency of Dental Caries and Status of Permanent Mandibular First Molar in Young Adults

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## ABSTRACT:

**Objectives:** To determine (a) the frequency of dental caries (b) existing status including the presence of broken down roots (BDRs), missing and filled or unfilled status of permanent mandibular first molar in young adults.

**Materials and Methods:** This study was conducted at out-patients clinics of Bahria University Medical and Dental College (BUMDC) from 1<sup>st</sup> January 2014 to 30<sup>th</sup> November 2014. The total numbers of subjects were 1529. Out of which 928 were males (60.7%) and 601 were females (39.3%). The sample was collected through convenience sampling and the performa was designed which comprised of demographic data including age, gender, carious and filled/unfilled status of left and right permanent mandibular molar (36,46) and informed verbal consent was taken.

**Results:** The study findings showed that higher caries incidence was present in left mandibular 1<sup>st</sup> molar (tooth # 36) as 232 individuals (15.17%) were affected by caries, compared to right mandibular 1<sup>st</sup> molar (tooth # 46) in which the affected individuals were only 209 (13.66%). Regarding the gender distribution, caries was present more in the males than the females as 179 males had caries and only 125 females were affected. Examined individuals have a better knowledge and awareness about oral hygiene practice as affected individuals were only 304 (19.9%). Least contribution was of filled teeth probably because of lack of availability of dental services, poor socioeconomic status and high treatment cost.

**Conclusion:** Frequency of dental caries in left and right mandibular first molars in young adults was low with least contribution of filled teeth.

**Keywords:** Frequency, Dental caries, Missing teeth, Young adults

## INTRODUCTION:

Oral health plays an important role in maintaining a healthy human body but it has unfortunately remained an ignored and unrealized major social problem.<sup>1</sup> Oral diseases ranging from dental caries (tooth decay) to oral cancer have become a major cause of pain and discomfort. Dental caries is one of the most frequent and prevalent chronic multi-factorial, microbial, infectious

disease in developed as well as in developing countries,<sup>2</sup> which afflict humans of all ages and all areas of the world.<sup>3</sup> It is characterized by demineralization of inorganic and organic substances of the tooth in which the calcified tissues of teeth are being attacked by the bacteria leading to their destruction.<sup>4</sup> Dietary sugars/carbohydrates are the most leading causes of this dental pathology which involves fermentation by the oral bacteria with progressive decalcification of tooth substance. In general four factors are identified regarding its etiology that are i) bacteria, ii) fermentable carbohydrates iii) a susceptible tooth surface and iv) time.<sup>5</sup> Dental caries has become a serious problem in many populations world wide with marked prevalence in several countries during the last decade and is frequently found among the populations having lack of awareness towards the maintenance of oral hygiene.<sup>6</sup>

The frequency of caries increases with the increase in age.<sup>7</sup> One of the study conducted in northeast China proved that 67.5% of elderly patients when examined were found to have dental caries with the prevalence in different regions ranging from 66.03% to 87.42%.<sup>8</sup> Other factors that increases frequency of caries are presence of plaque, poor oral hygiene, gender, inadequate tooth-brushing habits, frequency and timing of consumption of sugar-containing drinks. According to National Oral Health Survey report 2004, caries prevalence in India was 51.9%, 53.8% and 63.1% at ages 5, 12 and 15 years respectively.

According to Pakistan Oral Health survey 2006, Pakistan may also be classified as a low caries country. However, comparing the results of 2006 survey with the findings of similar surveys conducted in Pakistan under the auspices of the World Health Organization in 1979 & 1988, it was observed that the DMFT (Decay Missing Filled Teeth) score of 12 year old decreased from 2.2 in 1979 to 1.2 in 1988, but the present survey reports

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an increase in this score to 1.6. Similarly for the 15 year old the DMFT score went down to 1.8 in 1988 from 3.2 in 1979 and has witnessed an increase to 2.3 in 2003.<sup>9</sup> The aim of this study is to determine the frequency of dental caries in left and right mandibular first molars in young adults attending the Dental OPD of Bahria University Dental College along with the determination of existing status including the presence of broken down roots (BDRs), missing and filled/unfilled status of the following teeth (#36 and #46).

**MATERIALS AND METHODS:**

This cross-sectional study was conducted in young adults attending outpatient department (OPD) of Bahria University Medical and Dental College (BUMDC) Karachi, from 1<sup>st</sup> January to 30<sup>th</sup> November 2014. They were males and females between 18-35 years of age. Sample was collected through convenience sampling. The inclusion criteria was dentate patients who came for dental treatment, between 18-35 years of age of both genders, healthy individuals with no systemic disease and exclusion criterion was mentally retarded individuals or those who refused to give consent and patients above thirty five years age group. Demographic data of patients including age, gender of patient, carious and filled/unfilled status of left and right permanent mandibular molar (tooth number 36 and 46 are designated according to FDI Brachet tooth notation system) including class I, class II and class V carious lesions, filled or unfilled status of the selected teeth with amalgam, composite and Glass Ionomer restorations and presence of broken down roots (BDRs) or missing teeth were recorded in a predesigned performa following informed verbal consent. The data was analyzed by statistical program for social sciences (SPSS) version 15.0. The frequency and percentage was computed for a qualitative variable like gender and mean ± standard deviation was computed for quantitative variable like age. Collected data from these individuals was used to evaluate the frequency of dental caries and existing status of permanent mandibular first molar.

**RESULTS:**

A total of fifteen hundred and twenty nine (N=1529) individuals were examined, aged between 18-35 years (young adults). Out of which 928 (60.7%) were males and 601 (39.3%) were females (Table 1). The mean age was 23.49 years with standard deviation (SD±) 4.791. The male to female ratio was 3:2. Present study findings showed higher caries frequency in left mandibular 1<sup>st</sup> molar as 232 (15.17%) of tooth # 36 had carious lesions than the right mandibular 1<sup>st</sup> molar in which 209 (13.66%) were affected by caries (Table 2) and males were affected more than the females with 179 males to have carious lesions on permanent mandibular 1<sup>st</sup> molars whereas only 125 females had it. Current study findings also revealed that the majority of the first molars were caries free or were sound teeth, which is about 1200 (78.5%), 1243 (81.3%) in left and right respectively. Regarding the filled status of the teeth, 5 (0.3%) teeth of

#36 and 6 (0.4%) teeth of #46 were filled/ restored. As far as caries is concerned 157 (10.3%) had occlusal caries (Class 1) and 74 (4.8%) occlusal involving proximal surfaces (Class 2) and Class V caries was found in only in 01 (0.1%) case of 36. On the other hand in 46, 136 (8.9%), 73 (4.8%) had class I and class II caries respectively (Table 2).

Chi-Square Test was used to analyze the relationship between gender and caries, in lower left and right permanent mandibular first molars which showed a significant relationship between lower right mandibular first molar and lower left mandibular first molar with P-value 0.009 and 0.004 respectively.

Table:1  
Distribution of Study Subjects  
N=1529

	n	%
Male	928	60.7
Female	601	39.3
Total	1529	100.0

Table: 2  
Status of tooth #36 and 46

	Lower Left First Molar Tooth (36)		Lower Right First Molar Tooth (46)	
	n	%	n	%
Healthy (Sound)	1200	78.5	1243	81.3
Class I Caries	157	10.3	136	8.9
Class II caries	74	4.8	73	4.8
Class V caries	1	.1	0	.0
BDR	26	1.7	20	1.3
Filled	5	0.3	6	0.4
Missing	66	4.3	51	3.3
Total	1529 (100.0 %)			

**DISCUSSION:**

Oral health is a major part of general health which has an influence on general well-being of individuals. Among oral health problems, dental caries has been the most commonly investigated oral disease. Apart from other contributing factors, frequency of sugar consumption including sugary drinks and confectionery leads to occurrence of caries.<sup>10</sup> Sugar is considered as most important dietary factor that leads to enamel dissolution by acid fermentation of sugar in response to bacterial action.<sup>11</sup> Sugars can become a minor determinant of caries provided if fluoridated tooth pastes are used and with proper dental care, keeping this in consideration children are less prone to caries compared to adults.<sup>12</sup> The main goal of our study was to determine the frequency of dental caries in permanent mandibular 1<sup>st</sup> molars (tooth # 36 and tooth # 46) in young adults since it is the first permanent tooth to be erupted in the dental arch

and is the most neglected one in terms of oral hygiene maintenance. Permanent 1<sup>st</sup> molar erupts in the mouth by the age of 6 years and is considered to be susceptible to dental caries, therefore it requires maintenance from early childhood during which the oral hygiene maintenance is mostly found neglected. Studying the frequency of caries in permanent 1<sup>st</sup> molar can be used as an aid in planning a preventive strategy to minimize the risk of decay. Improvement in parent's knowledge about the importance of these teeth should be made a key objective especially because most parents are unaware that these teeth are the first permanent teeth to erupt.<sup>13</sup>

According to our study, the presence of caries in left and right mandibular 1<sup>st</sup> molars is 232 (15.17%), 209 (13.66%) respectively and overall affected individuals were only 304 (19.9%) including males and females. It revealed that higher caries frequency is found in left than right mandibular first molar and showed that there are more chances of having occlusal caries (Class I) compared to occluso-proximal lesions (Class II). This can be attributed to the preventive effects of fluoride on smooth surface as it is consistent with the past studies by different authors.<sup>14,15</sup> Our research revealed less frequency of caries in the examined individuals as the affected individuals were only 304 (19.9%) contrary to previous researches which showed high frequency. This is attributed to a short sample size of examined individuals and also the sample was collected through the convenience sampling in which the individuals who reported to the OPD were those who found convenient accessibility and visited the OPD for regular consultation rather than presenting with any dental pathology of the selected tooth. A study conducted in Nigeria has demonstrated that the right mandibular first molar had the highest tooth-specific caries frequency (3.5%) in the permanent dentition and mandibular left first molar had highest caries frequency (4.7%) in the deciduous dentition.<sup>16</sup> In our study the frequency was higher in left mandibular molar probably because of left-handed tooth brushing or mostly the patients included in our research used left side for mastication that leads to higher frequency on the left side contrary to previous researches which showed bilateral occurrence in both arches.<sup>17</sup> Although the frequency and severity of dental caries has decreased substantially in the last two decades, this largely preventable disease is still common. The rate of decay increases significantly with age, and is still a major public health problem. According to another research on bilateral occurrence of caries on first permanent molars, the caries frequency was same on both sides in maxilla and mandible and no significant differences were found on the right and left side. An oral health survey of high school students conducted in Tibet, China (2013-2014) revealed that due to poor oral health practice and unawareness of oral health services the caries frequency was 40%.<sup>18</sup> Such high caries frequency among Tibet population requires implementation of oral health promotions and health education.<sup>14,19</sup> According to National Oral Health Survey

reports of 2004 caries frequency in India was 51.9%, 53.8% and 63.1% at ages 5, 12 and 15 years respectively in different parts of India. In Pakistan the DMFT rates reported by Oral Survey 2006, showed that the mean DMFT score for the age of 12 years was 1.38, for the age of 15 years was 1.94, for the age of 35-44 years was 8.02 & for the age of 65 years and above it was 17.75. Other important finding of the Oral Health survey Pakistan 2006, included that more than 50% of the children between the ages of 12-18 years were caries free and on the negative side 97% of all carious lesions in the same age group were untreated which is also evident in our study. For the age group of 35-44 year, half of the lesions were untreated while more than 90% of the treatment offered was extraction.

Regarding the gender distribution, the present study showed that caries was present more in the males than the females as 179 males were affected and only 125 females had the carious lesions on permanent mandibular right and left first molars. This is attributed to high male to female ratio (3:2). Also females are more health conscious and are very careful in terms of maintaining good oral hygiene but a lot of previous studies have showed a greater caries ratio in females than males. One of the study demonstrated that caries rates are high in women than in men because of different factors like different salivary composition and flow rate, hormonal fluctuations etc. and also some of the systemic diseases associated with caries have an association with female gender.<sup>20</sup> According to another research caries assessment between different age groups of males and females showed no significant sex differentiation for ages between 1-5 years and a same count of affected teeth was found in adults (18-59 years).<sup>21</sup> One of the research conducted in city of Zurich in 2008 have reported male gender as risk factor for caries.<sup>22</sup> The study conducted among the children of Kerala revealed that boys and girls are equally affected or with females slightly more affected.<sup>23</sup> More researches are required to define sex disparities in dental caries across the population. Same is true for Pakistan.<sup>24,25</sup> Healthy teeth formed the major component of this study, as in greater number of individuals there were no caries which shows that the examined individuals have a better knowledge and awareness about oral hygiene practice as affected individuals were only 304 (19.9%). Least contribution was of filled teeth probably because of lack of availability of dental services, poor socioeconomic status and high treatment cost.

#### **CONCLUSION:**

Higher frequency of caries was found in left mandibular first molar compared to right mandibular molar with males exhibiting higher rate than females. Regarding oral hygiene practice, the greater percentage of healthy teeth shows that the examined individuals have a better knowledge and awareness about oral hygiene practice as affected individuals were only 19.9%. Least contribution of filled teeth was probably because of lack of availability of dental services, poor socioeconomic status and high treatment cost, while those who require

treatment prefers extraction rather than restoration due to possible drawbacks of unavailability of Dental services and non-affordability.

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