

FREQUENCY AND DISTRIBUTION OF DENTAL CARIES IN TEETH AND ARCHES OF PATIENTS EXAMINED AT PUNJAB DENTAL HOSPITAL, LAHORE

¹AAMIR MEHMOOD KHAN

²SARA MARIYUM

³SHAHZAD ALI SHAH

⁴SHAKEEL UR REHMAN

⁵SOBIA MASOOD TIRMAZI

ABSTRACT

Worldwide prevalence of dental caries is very high reaching to more than 95% in developing countries. . Dental caries is a multi-factorial, dynamic and infectious microbiologic disease process resulting from imbalance in the physiologic equilibrium between the tooth mineral and the plaque liquid. The study design was cross-sectional. This study aim was to evaluate the frequency & distribution of dental caries in teeth and arches of caries patients reporting to department of Operative dentistry at Punjab Dental Hospital, Lahore. Total of 15323 patients with caries reporting to the OPD of Operative dentistry at Punjab Dental hospital were examined with age range of 10 to 60 years or more.

Frequency of carious teeth in age group 20-29 years was maximum and minimum in age group 60 years or more. Dental caries was more prevalent in mandible (53%)(n=8162) than in maxilla(47%)(n=7158). In both the arches, first molars were the most frequently affected teeth by caries. Caries was found to be more prevalent in mandible than maxilla.

INTRODUCTION

Historically dental caries and periodontal disease have been considered the most important global oral health burdens.¹ Worldwide, the prevalence of dental caries is very high reaching to more than 95% in developing countries.² Unfortunately, in developing countries more than 90% of caries is untreated.³ There is no geographic place in the world whose inhabitant do not exhibit some evidence of caries. Globally the disease is more prevalent in Latin America, Middle East, South Asia and least prevalent in China.⁴

Dental caries is the localized destruction of susceptible dental hard tissue by acidic by-products from

bacterial fermentation of dietary carbohydrates. It is a multi-factorial, dynamic and infectious microbiologic disease process resulting from imbalance in the physiologic equilibrium between the tooth mineral and the plaque liquid. The demineralization and remineralization processes go side by side and demineralization can be arrested at any point in time.⁵

Mineral loss and consequent cavity formation is a result of imbalance in the dynamic equilibrium between tooth mineral and plaque fluid. In unfavourable conditions, the remineralization rate does not sufficiently neutralize the rate of demineralization and caries occurs.^{6,7}

Detection of dental caries involves primarily visual, tactile and radiographic methods. Nowadays some novel methods are also available for caries detection like lasers, Digital Imaging Fiber Optic Transillumination (DIFOTI), Quantitative Light Fluorescence (QLF) and electric methods.

The treatment of dental caries is costly for governments of both developed and developing countries and in industrialised countries. It costs between 5 and 10% of total health care expenditures that is more than the cost of treating cardiovascular disease, cancer and osteoporosis.⁸ In developing countries, the cost of traditional restorative treatment of dental disease is

¹ Aamir Mehmood Khan, Assistant Professor Operative Dentistry & Endodontics, Peshawar Dental College, Peshawar

Correspondence for Postal Service: House 11, Sector K-5, Phase-3, Hayatabad, Peshawar.

For future correspondence: Email: iamwazir@hotmail.com
Cell: 0333-9009595

² Sara Mariyum, PG trainee M Phil (Biochemistry), Peshawar Medical College, Peshawar

³ Shahzad Ali Shah, Associate Professor Operative Dentistry & Endodontics, Peshawar Dental College, Peshawar

⁴ Shakeel Ur Rehman, Associate Professor, Operative Dentistry & Endodontics, Sardar Begum Dental College, Peshawar

⁵ Sobia Masood Tirmazi, Assistant Professor, Operative Dentistry & Endodontics, CMH Dental College, Lahore

Received for Publication: September 20, 2015

Revised: November 12, 2015

Approved: November 27, 2015

disproportionately high because of the low public health priority and it would exceed the available resources for health care.³

The cost effectiveness and large financial benefits of preventing dental diseases should be emphasised in developing countries.³ Epidemiological data is mandatory to plan preventive strategies for dental caries. Hence, this study aims to evaluate the frequency and distribution of dental caries in teeth and arches of caries patients reporting to department of Operative dentistry at Punjab Dental Hospital, Lahore.

METHODOLOGY

It was a cross sectional survey of the patients who presented at OPD of Operative dentistry at Punjab Dental Hospital, Lahore. The duration of study was one year that is from January 2014 to December 2014. The convenience sampling technique was used for selecting the patients. All the patients who presented at OPD of Operative Dentistry were selected. Informed verbal consent was taken from each patient.

The inclusion criteria for selecting the patients was that presence of cavitation must be confirmed by the faculty member of Operative department of age 10 years or more. The exclusion criteria were age less than 10 years, abnormal shape of teeth and presence of other developmental problems like amelogenesis imperfecta and dentinogenesis imperfecta.

The presence of dental caries was evaluated through visual and visuo-tactile methods. Mouth mirrors and probes were used for examination. Probes are the tool to detect cavitations by tactile sensation. Ash's sickle Probe No. 54 was used for the detection of pits and fissure caries whereas Ash's Probe No. 12 was for proximal caries lesions. These probes have pointed ends. All teeth were thoroughly dried before examination. A pit and fissure was considered as carious when the point sticks without doubt and required a definite pull to be removed. Proximal lesions were considered if the Ash's Probe No. 12 catches a roughened surface or definite cavity. Arrested caries was considered and included as caries lesion. The data were analyzed by SPSS version 13.0 and analyzed through its statistical package.

RESULTS

15323 patients with caries reporting to the OPD of Operative dentistry at Punjab Dental hospital were examined with age range of 10 to 60 or more and mean age of 37.80± 2.8. The study sample comprised of 48% male (n=7302) and 52% female (n=8021) with the male to female ratio of 1:1.08. (Fig 1)

Frequency of carious teeth in age group 20-29 years was maximum and minimum in age group 60 years or more. Age-wise frequency of dental caries was 34%

(n=5293) in age group 20-29 years, 22% (n=3433) in age group 30-39 years, 18% (n=2691) in age group 10-19 years, 17% (n=2573) in age group 40-49 years, 6% (874) in age group 50-59 years and 3% (n=459) in age group 60 years or more. (Fig 2)

Dental caries was more prevalent in mandible (53%) (n=8162) than in maxilla (47%) (n=7158) of the study participants (Fig 3). In mandible, frequency of dental caries was highest in the first molar whereas it was lowest in central incisor, lateral incisor and canine. In maxilla also, the frequency of caries was highest in first molar but lowest in third molar.

In mandible, tooth wise distribution showed that caries frequency was 52% in mandibular first molar, 23% in mandibular second molar, 13% in mandibular second premolar, 6% in mandibular first premolar, 3% in mandibular third molar and 1% each in mandibular central incisor, mandibular lateral incisor and mandibular canine. (Fig 4)

In maxilla, caries frequency was 29% in maxillary first molar, 14% each in maxillary central incisor, maxillary second premolar and maxillary first premolar, 10 % each in maxillary lateral and maxillary second molar, 8% in maxillary canine and 1% in maxillary third molar. (Fig 5)

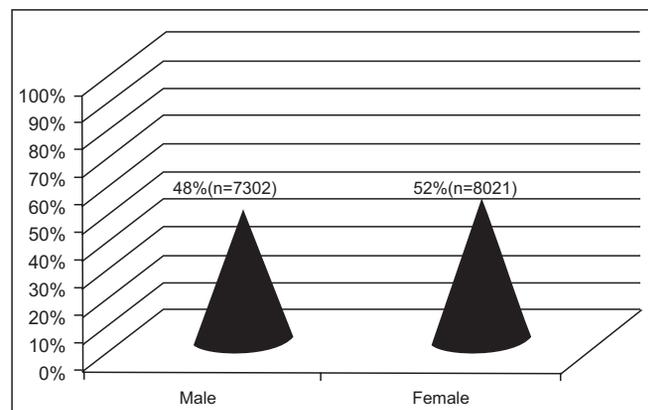


Fig 1: Gender wise distribution of dental caries

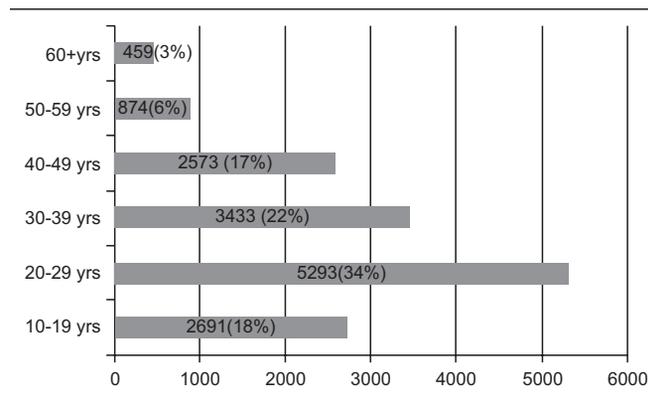


Fig 2: Age-wise frequency of dental caries

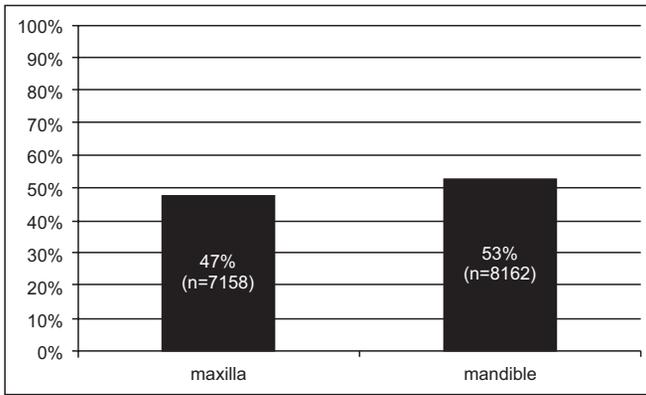


Fig 3: Jaw-wise (mandible or maxilla) distribution of caries

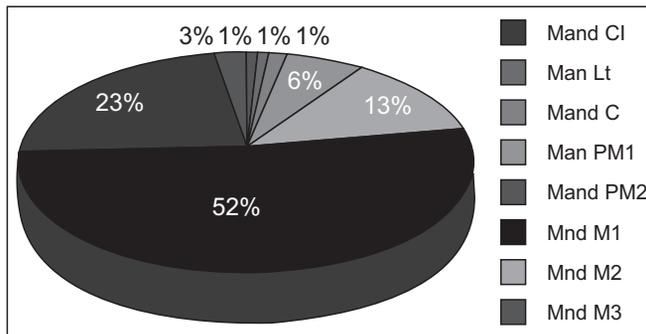


Fig 4: Caries frequency in Mandible

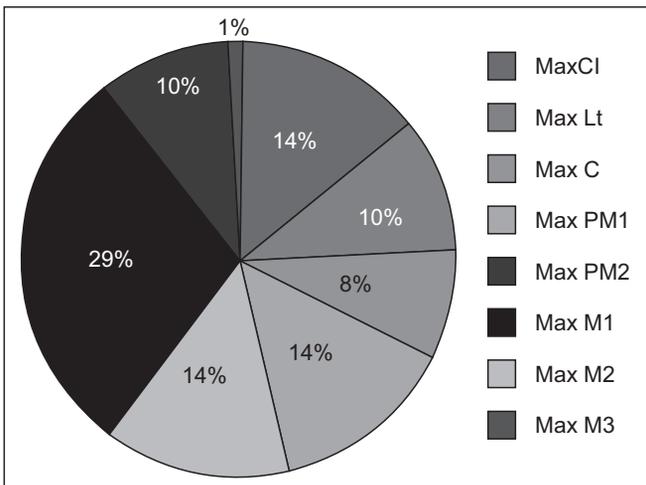


Fig 5: Caries frequency in Maxilla

DISCUSSION

Most of the studies investigating the epidemiology of dental caries have included a specific age group and mostly children whereas the present study included almost all age groups ranging from 10 years to 60 years and more. Another strength of this study a large sample size (n=15323).

A slight female predilection of caries was found in the present study i.e. female 52% and male 48%. This is in contrast to the study results of Badar et al⁹, Sarvana et al¹⁰ and shaikh et al.¹¹ However, Mosha et al¹², Sohal

Kapal Singh et al¹³ and a study in the Khairpur district of Pakistan reported higher frequency of dental caries in female as compared to male.¹⁴ Maru et al reported no significant differences in caries frequency between genders.¹⁵ The variations could be attributed to the different age groups and geographic locations studied in the surveys.

Caries was found to be more prevalent in mandible than maxilla. This finding is in co-incidence with the previous studies.^{16,17} However, Qazi et al reported different result with higher prevalence of caries in the maxilla.¹⁸ The difference in the result may be attributed to the fact that in that particular survey, the studied population comprised of patients having malocclusions and there is evidence in literature that higher prevalence of severe crowding and contact point displacement exists in the maxilla that makes teeth more prone to caries.¹⁹

In the current study it was found that in both the arches the first molars were the most frequently affected teeth by caries. This finding is similar to the previous results.^{17,20,21} The higher prevalence of caries in first molars may be explained by the fact that these teeth erupt early in the mouth when oral hygiene is mostly neglected and the child lacks the manual dexterity required for proper brushing. In addition, the anatomy of the occlusal surfaces of these teeth results in food retention due to escape from the flushing action of the saliva. Mandibular anterior were least affected by caries, probably because of constant cleaning action by the flushing effect of saliva and tongue.

One of the limitations of the present study was that radiographs were not used in all the participants. Consequently, the root caries may have missed detection in the participants that is very difficult in the absence of radiographs. In addition, as there was less number of participants in few subgroups, therefore, the findings of this study might need some caution in interpretation. Findings of the present study indicate that further studies must be conducted in different cities of Pakistan to further explore the frequency and distribution of dental caries in caries patients which will be helpful in gaining immediate attention of policy makers and political administrations. It is recommended for future policy that dental services should immediately be oriented towards a preventive approach in order to decrease the burden of oral diseases in Pakistan.

CONCLUSION

In both the arches the first molars were the most frequently affected teeth by caries in caries patients reporting to department of Operative dentistry at Punjab Dental Hospital, Lahore. Caries was found to be more prevalent in mandible than maxilla.

REFERENCES

- 1 Peterson PK, Bourgeois D, Ogawa H, Day S E, Ndiya C. The global burden of oral diseases and risks to oral health. *Bulleton of WHO* 2004; 93(9): 661-69.
- 2 Roberts, W, Wright T. The dynamic process of demineralization and remineralization, *Dimention of Dental Hygiene*. Belmont Publications; July, 2009; 7(7): 16-21.
- 3 Moynihan P, Petersen PE. Diet, nutrition and the prevention of dental diseases. *Public Health Nutr.* 2004; 7(1A): 201-26.
- 4 Petersen PE. World Health Organization global policy for improvement of oral health World Health Assembly. 2007, IDJ; 2008; 58(3): 115-21.
- 5 Fontana M, Young DA, Wolff MS, Pitts NB, Longbottom C. Defining Dental Caries for 2010 and beyond. *Dent Clin N Am* 2010; 54: 423-40.
- 6 Fejerskov O. Concepts of dental caries and their consequences for understanding the disease. *Comm. Dent Oral Epidemiol* 1997; 25: 5-12.
- 7 Shah SA, Muntaha ST, Munir MB. Incidence of caries in 6-12 years children visiting Punjab dental hospital, Lahore and Sardar Begum Dental College and Hospital, Peshawar. *Pak Oral Dental J*; 28(1): 117-22.
- 8 Sheiham A. Dietary effects on dental diseases. *Public Health Nutrition* 2001; 4: 569-91.
- 9 Badar S, Channar S, Bhutta N, Arshad S. Dental caries; frequency and determinants among patients attending dental outpatient department in Bahawal Victoria Hospital Bhawalpur. *Professional Med J.* 2012; 19(3): 117-22.
- 10 Sarvana S, Kalyani V, Viyayarani MP, Jayakodi P, Felix J, Arunmozhi P, et al. Caries prevalence and treatment needs of rural school children in Chidambaram Taluk, Tamil Nadu, South India. *Indian J Dent Res* 2008; 19(3): 186-90.
- 11 Shaikh MI, Rajput F, Khatoon S, Shaikh MA. Prevalence of dental caries in Bibi Aseefa Dental College, Larkana areas. *Pak Oral Dental J* 2014; 34(1): 131-34.
- 12 Mosha HJ, Ngilisho LA, Nkwera H, Scheutz F, Poulsen S. Oral health status and treatment needs in different age groups in two regions of Tanzania. *Community Dent Oral Epidemiol.* 1994; 22(5 pt 1) 307-10.
- 13 Singh SK, Stanslaus OS, Aroon HV. Occurrence of dental caries among the adults attending a regional referral hospital in Tanzania. *J orofac Res* 2014; 4(1): 30-34.
- 14 Shaikh IA, Kalhoro FA, Pirzado AS, Memon AB, Sahito MA, Dahri WM, Malhi P. Prevalence of dental caries among students of Khairpur district. *Pak Oral Dental J* 2014; 34(4): 680-83.
- 15 Maru AM, Narendern S. Epidemiology of dental caries among adults in a rural area in India *J Contemp* 2012; 13(3): 382-88.
- 16 Sarvana S, Madivanan I, Subashini B, Felix JW. Prevalence pattern of dental caries in primary dentition among school children. *Indian J Dent Res* 2005; 16: 140-46.
- 17 Kutesa A, Mwanika A, Wandera M. Pattern of dental caries in Mulago dental school clinic, Uganda. *Afr Health Sci* 2005; 5: 65-68.
- 18 Qazi HS, Azam S, Kurram MS, Zia AU. Prevalence of dental caries in the permanent dentition of patients seeking orthodontic treatment in Bara Kahu. *Pak Oral Dental J* 2011; 31(2): 371-73.
- 19 Lux CJ, Ducker B, Pritsch M, Niekush U. Space conditions and prevalence of anterior spacing and crowding among nine year old children. *Journal of Orthodontics* 2008; 35: 33-42.
- 20 Khan AA, Jain SK, Shrivastav A. Prevalence of dental caries among the population of Gwalior (India) in relation of different associated factors. *Eur J Dent* 2008; 2: 81-85.
- 21 Togoo RA, Yaseen SM, Zakirullah M et al. Prevalence of first permanent molar caries among 7-10 years old school going boys in Abha City, Saudia Arabia. *J Int Oral Health* 2011; 3: 30-34.

CONTRIBUTION BY AUTHORS

- | | |
|--------------------------------|-------------------------------|
| 1 Aamir Mehmood Khan: | Principal author. |
| 2 Sara Mariyum: | Helped in result compilation. |
| 3 Shahzad Ali Shah: | Helped in discussion. |
| 4 Shakeel ur Rehman: | Helped in discussion. |
| 5 Sobia Masood Tirmazi: | Helped in data collection. |