ORIGINAL ARTICLE

CAUSES OF TOOTH EXTRACTION AMONGST DIABETIC PATIENTS SEEN IN A DENTAL HOSPITAL IN PESHAWAR

[1]JAWAD AHMAD KUNDI
[2]MUHAMMAD SHAHID KHAN KHATTAK
[3]SYED MURAD ALI SHAH
[4]MUHAMMAD ILYAS
[5]ARIFULLAH KHAN
[6]SALMAN KHAN

ABSTRACT

The aim of the study was to evaluate the causes of common conditions leading to tooth extraction, male / female ratio in diabetic patients.

This was a retrospective cohort study. Data were collected from previous records between January 2011 to July 2015 from the Department of Oral and Maxillofacial Surgery, Sardar Begum Dental College, Peshawar. Among 2,103 total diabetic patients presented to the department, 1,618 diabetic patients have their complete record for tooth extractions. The primary reasons for exodontia specified in the records were Caries, Periodontitis, others. Others include those patients who have extractions either due to preprosthetic purpose, trauma or fracture or any other reason other than caries and periodontitis. The data was analysed through SPSS 22.

The mean age presentation was 47.50 ± 19.82 years and the age range 25-70 years. There were 1,618 extractions carried out in 2,103 subjects (76.94%). The female diabetic patients predominate n=983 (60.75%) the male patients n=635 (39.25%). Caries was the dominant cause of tooth extraction in both subjects n= 1042 (64.40%) followed by periodontitis n= 416 (25.71%) and others n=160 (9.90%).

Caries is the dominant cause of extraction in diabetic patients and female diabetic patients predominate male diabetic patients in terms of tooth extraction.

Key Words: *Diabetes mellitus, Caries, Periodontitis.*

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic disorders associated with a quantitative reduction in insulin production or a qualitative reduction in the action of insulin leading to changes in carbohydrate, protein, and lipid metabolism and accumulation of glucose in the bloodstream.[1] Increased glucose in the bloodstream results in hyperglycemia which affects a variety of tissues and organ systems including eyes, nerves, kidneys, and blood vessels. The periodontal tissues are also affected as a result of hyperglycemia, and has been described as the sixth complication of diabetes mellitus.[2] There is no strong evidence about the association of diabetes mellitus and infections however some specific infections are more common and some are associated with increased risk of complications in diabetic patients.[3] Several aspects of immunity are altered in diabetic patients; polymorphonuclear leukocyte function is depressed particularly when acidosis is also present, their adherence, chemotaxis and phagocytosis is affected.[4] Antioxidant systems involved in bactericidal activity may also be impaired.[5]

Various inflammatory diseases and soft tissues pathologies in oral cavity are associated with diabetes mellitus[6] with periodontitis[7] as the most common ail-

[1] Dr Jawad Ahmad Kundi, BDS, DHPM, MCPS, FCPS, Professor & Head of Oral & Maxillofacial Surgery Department, Vice Principal Sardar Begum Dental College, Peshawar.
Email: jkundi@gmail.com Cell: 0333-9126606
[2] Dr Muhammad Shahid Khan Khattak, BDS, FCPS, Associate Professor, Department of Oral & Maxillofacial Surgery, Sardar Begum Dental College, Peshawar
[3] Dr Syed Murad Ali Shah, BDS, FCPS, Associate Professor, Department of Oral & Maxillofacial Surgery, Sardar Begum Dental College, Peshawar
[4] Dr Muhammad Ilyas, BDS, FCPS Trainee, Resident Oral & Maxillofacial Surgery, Department of Oral & Maxillofacial Surgery, Sardar Begum Dental College, Peshawar
[5] Dr Arifullah Khan, BDS, MDS Trainee, Resident Oral & Maxillofacial Surgery, Department of Oral & Maxillofacial Surgery, Sardar Begum Dental College, Peshawar
[6] Dr Salman Khan, BDS, MDS Trainee, Resident Oral & Maxillofacial Surgery, Department of Oral & Maxillofacial Surgery, Sardar Begum Dental College, Peshawar

Received for Publication: September 12, 2015
Revised: November 20, 2015
Approved: November 23, 2015

ment followed by salivary dysfunction[8], oral infections[9], oral mucosal diseases[10], neuro-sensory oral disorders[11], dental caries[12] and delayed wound healing.[13] The plaque biofilm results in gingivitis which extends to irreversible periodontitis and ultimately tooth loss.[14] The cleansing and buffering capacity of the saliva is diminished in patients with diabetes mellitus resulting in increased susceptibility of caries and tooth loss.[12]

Currently diabetes mellitus affects 387 million people worldwide[15] with type 2 diabetes making up about 90% of the cases[16,17] with 80% of burden in low and middle income countries[18] and 8.3% adult population is involved1[7] with equal rates in men and women.[19] From 2012 to 2014, diabetes is estimated to have resulted in 1.5 to 4.9 million deaths each year.[15,20] Pakistan belongs to a high prevalence area, currently having 6.9 million affected, with projected estimates expected to double by 2025 and affect 11.5 million people.[21] Obesity and sedentary life style and increase in caloric intake played a major role in the progression of this chronic illness.[22] Dental Caries and poor oral hygiene status are the main reason for exodontia in general population.[23] Poor oral hygiene has been associated with periodontal attachment loss and results in extraction of teeth in diabetic patients in Pakistan.[24] It has been estimated that the risk for dental extraction increases in diabetic patients as compared to non-diabetic patients due to increase in dental caries to about 3-fold in diabetic patients.[25]

The aim of the study was to evaluate the frequency of common conditions leading to tooth extraction, male/female ratio in diabetic patients.

METHODOLOGY

This was a retrospective cohort study. Data was collected from previous records between January 2011 to July 2015 from the Department of Oral and Maxillofacial Surgery, Sardar Begum Dental College, Peshawar. Among 2,103 total diabetic patients presented to the department, 1,618 diabetic patients have their complete record for tooth extractions. The primary reasons for exodontia specified in the records were Caries, Periodontitis, others. Others include those patients who have extractions either due to preprosthetic purpose, trauma or fracture or any other reason other than caries and periodontitis. The data was analysed through SPSS 22.

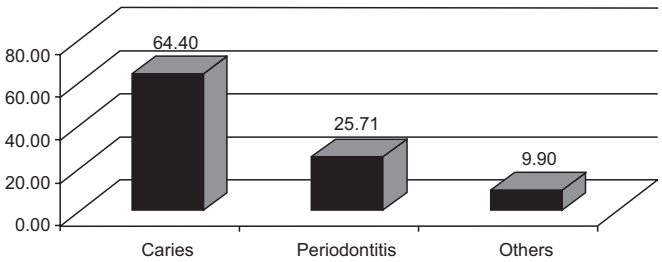

Fig 1: Causes of extraction in diabetic patients from January 2011-July 2015

RESULTS

The mean age presentation was 47.50 ± 19.82 years and the age range 25-70 years. There were 1,618 extractions carried out in 2,103 subjects (76.94%). The female diabetic patients predominate n=983 (60.75%) the male patients n=635 (39.25%). Caries was the dominant cause of tooth extraction in both subjects n= 1042 (64.40%) followed by periodontitis n= 416 (25.71%) and others n=160 (9.90%). Among male diabetic patients, n=418(65.83%) individuals carried out their tooth extractions due to caries, n=157 (24.72%) periodontitis and n=60 (9.45%) others. Among female diabetic patients, periodontitis as a cause of tooth extraction is a little prominent than male diabetic patients with n= 259 (26.35%). The ratio of caries as cause of tooth extraction in male to female is 1.04 while that of periodontitis is 0.94. Fig 1 shows the total causes of tooth extraction in diabetic patients in percentage and Table 1 shows causes of extraction in male and female diabetic patients and male/female ratio.

DISCUSSION

The study was conducted in a dental hospital in Peshawar. Current study revealed higher frequency of tooth extraction for female than male, which contradict the western population[26] and the study done by Haseeb M et al.[27] Caries was the predominant condition in both female and male diabetes mellitus leading to tooth extraction (64.40%) in the present study as in the previous study which is 63.1% in the total population.[27] It means the frequency of cause of tooth extraction as caries in both diabetic (64.40%) and non-diabetic (63.1%) patients are nearly the same. Periodontitis was found

TABLE 1: TOOTH EXTRACTIONS ACCORDING TO VARIOUS CAUSES IN MALE AND FEMALE DIABETIC PATIENTS

Causes	Tooth Extractions in male diabetic patients, n (%)	Tooth Extractions in female diabetic patients, n (%)	Male/female ratio
Caries	418 (65.83)	624 (63.48)	1.04
Periodontitis	157 (24.72)	259 (26.35)	0.94
Others	60 (09.45)	100 (10.17)	0.93
Total	635 (100)	983 (100)	0.65

to be the second common cause of tooth extractions in diabetic patients with considerable percentage of 25.71% which support the previous study on general population which is 26.2%.[27]

The results obtained from the present study suggest that Dental / Health Care Professionals should reform the preventive aspects of dentistry by engaging media, local organizations to carry out the awareness in diabetic patients as well in general population regarding oral health care. The results of this study can be generalized to the diabetic patients in the community. Results revealed high risk dental disease leading to tooth extraction in diabetic patients thus promoting health education regarding diabetes mellitus and oral hygiene and periodic dental checkups should be the strategies in order to demote the frequency of the effect of diabetes mellitus on oral health status.

CONCLUSION

Caries is the dominant cause of extraction in diabetic patients and female diabetic patients predominate male diabetic patients in terms of tooth extraction.

REFERENCE

1 Mealey B, Rees T, Rose L. Systemic factors impacting the periodontium. In: Rose L, Mealey B, editors. Periodontics medicine, surgery, and implants. St. Louis: Elsevier Mosby; 2004.

2 Loe H. Periodontal disease: The sixth complication of diabetes mellitus. Diabetes Care. 1993; 16 Suppl 1: 329-34.

3 Wheat LJ Infection and diabetes mellitus. Diabetic Care 1980; 3: 187-97.

4 Delamaire M, Maugendre D, Moreno M, Le-Goff MC, Allannic H, Genetet B. Impaired leukocyte functions in diabetic patients Diabet Med 1997; 14: 29-34.

5 Muchova J, Liptakova A, Orszaghova Z et al Antioxidant systems in in polymorphonuclear leukocytes of type 2 diabetes mellitus. Diabet Med 1999; 16: 74-78.

6 Vernillo AT. Dental considerations for the treatment of patients with diabetes mellitus. Am Dent Assoc 2003; 134: 24-33.

7 Poul EP. Priorities for research for oral health in the 21st Century — the approach of the WHO Global Oral health program. Community Dental Health 2005; 22: 71-74.

8 Moore PA, Guggenheimer J, Etzel KR, Weyant RJ, Orchard T. Type 1 diabetes mellitus, xerostomia, and salivary flow rates. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001; 92: 281-91.

9 Lamey PJ, Darwaza A, Fisher BM, Samaranayake LP, MacFarlane TW, Frier BM. Secretor status, candidal carriage and candidal infection in patients with diabetes mellitus. J Oral Pathol 1988; 17: 354-57.

10 Amerikanou CP, Markopoulos AK, Belazi M,Karamitsos D, Papanayotou P. Prevalence of oral lichen planus in diabetes mellitus according to the type of diabetes. Oral Dis 1998; 4: 37-40.

11 ADA Division of Communications. Burning mouth syndrome. J Am Dent Assoc 2005; 136: 1191.

12 Collin H-L, Uusitupa M, Niskanen L, Koivisto A-M, Markkanen H, Meurman JH. Caries in patients with non-insulin-dependent diabetes mellitus. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998; 85: 680-85.

13 Abiko Y, Selimovic D. The mechanism of protracted wound healing on oral mucosa in diabetes: Review. Bosn J Basic Med Sci 2010; 10: 186-91.

14 Highfield MJ. Diagnosis and classification of periodontal disease. Aust Dent J. 2009: Vol. 54 supplement 1, pp. S11-S26.

15 IDF. International Diabetes Federation. Update-2014. 29 November, 2014: Retrieved from: http://www.idf.org/diabetesatlas

16 Melmed S, Polonsky KS, Larsen PR, Kronenburg HM. Type 2 Diabetes mellitus. In: Williams textbook of endocrinology (12th ed.). Reed: Philadelphia: Elsevier/Saunders. 1371-1435. ISBN 978-1-4377-0324-5.

17 Shi Y, Hu FB. The global implications of diabetes and cancer. The Lancet.7 June 2014: 383 (9933): 1947-48.

18 International Diabetes Federation. Diabetes Atlas. 3rd ed. Brussels, Belgium: 2006. Retrieved from: https://www.idf.org/sites/default/files/Diabetes-Atlas-3rd-edition.pdf

19 Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M. et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010: Dec 15, 2012. Lancet 380 (9859): 2163-96.

20 World Health Organization. The top 10 causes of death Fact Sheet 310. Oct 2013.

21 World Health Organization. Pakistan ranked 7th on diabetes prevalence list. The Nation. 15 Nov-2008.

22 Iqbal N. The burden of type 2 diabetes: strategies to prevent or delay onset. Vasc Health Risk Manag.2007 august: 3(4): 511-20.

23 Khandekar R, Fuad Z, Khusaibi AMA. Magnitude and determinants of exodontias in Batinah region of Oman. A cross sectional study. SQU journal for scientific research: Medical sciences 2003; 521-25.

24 Tanwir F, Altamash M, Gustafsson A. Effects of diabetes on periodontal status of a population with poor oral health. Acta Odontol Scand 2009; 67: 129-33.

25 Mata AD, Marques S, Rocha S, et al. Effects of diabetes mellitus on salivary secretion and its composition in the human. Molecular and Cellular Biochemistry. 2004; 32(6): 417-21.

32 McCaul LK, Jenkins WM, Kay EJ. Reasons for extraction of permanent teeth in Scotland-a 15 year follow up. J Dent 2001; 29: 401-07.

33 Haseeb M, Ali K, Munir MF. Causes of extraction in tertiary care hospital in Pakistan. J Pak Med Assoc august 2012; 62 (8): 812-15.

CONTRIBUTION BY AUTHORS

1 Jawad Ahmad Kundi:	Principal author/data reviewer/discussion.
2 Muhammad Shahid Khan Khattak:	Abstract/co-author.
3 Syed Murad Ali Shah:	Introduction/literature review.
4 Muhammad Ilyas:	Data collection/results/conclusion/editing.
5 Arifullah Khan:	Data collection.
6 Salman Khan:	Data collection.