

Prevalence of Erectile Dysfunction and Associated Risk Factors among Patients with Chronic Periodontitis Attending Various Dental Clinics

Mohammed Jayed S. Alenzi, MD*

Background: There is scarce local data available regarding the prevalence of erectile dysfunction and its association with chronic periodontitis for the Saudi population. Both phenomena share common cardiovascular and metabolic risk factors, such as smoking, diabetes and hypertension.

Objective: To evaluate the prevalence of erectile dysfunction among patients presenting with dental problems.

Design: A Cross-Sectional Study.

Setting: The Specialist Dental Center, Al-Qurayyat; The Specialist Dental Center, Aljouf; Dental Clinics in the Primary Care Centers in Skaka City; Dental Clinic Centers affiliated to the Faculty of Dentistry, Jouf University, Aljouf, Saudi Arabia.

Method: Nine hundred eighty-three male patients visiting different dental clinics filled a standard proforma after giving informed consent. It contained variables like age, relevant medical history, and Arabic translation of the Sexual Health Inventory for Men (SHIM) questionnaire. A dental surgeon evaluated the patients and a diagnosis of chronic periodontitis was ascertained.

Result: A total of 983 males with a mean age of 39.1 ± 12.2 years were included. Erectile dysfunction was found in 309 (31.4%) patients visiting dental clinics. Increasing age, smoking, and diabetes were significantly associated with erectile dysfunction. Chronic periodontitis was found to be significantly associated with erectile dysfunction (P-value < 0.001).

Conclusion: The increased prevalence rate of erectile dysfunction among males with dental problems indicates that screening for erectile dysfunction in patients attending dental clinics is a growing necessity. It may also be concluded that erectile dysfunction and chronic periodontitis are in association with each other.

Bahrain Med Bull 2020; 42 (4): 257 - 260

In erectile dysfunction, an individual is unable to develop or maintain an erection during sexual intercourse^{1,2,3,4}. This disorder is also called impotence and like other sexual dysfunctions, this condition becomes more common with age. Sexual intercourse could be pivotal in human affairs; therefore, the inability to perform is associated with emotional and psychological stigma.

A high proportion of males experience erectile dysfunction at a specific point in their life cycle; usually after the fourth decade of age^{5,6}. The total prevalence rate of erectile dysfunction in male individuals could reach up to 16%. Erectile dysfunction prevalence differs significantly according to geographical location; however, it ranges from a high prevalence rate of 22% of males in the United States to as low as 10% in Spain⁶. In different cross-sectional studies, the total prevalence rate of erectile dysfunction in males above twenty years was approximately 18.4%⁷. In multivariable analyses, erectile

dysfunction was remarkably and independently associated with diabetes, lower educational level, and lack of practicing physical activities⁷.

Chronic periodontitis is common in adults; it is uncommon in children or adolescents. It is plaque-induced and a major factor influencing the mortality rate in the world^{8,9,10}. Periodontal disease is of growing interest because of its association with cardiovascular diseases and diabetes mellitus, smoking, coronary heart disorder, cerebrovascular disorder, and dyslipidemia; therefore, the term "periodontal medicine" has been used to indicate its potential public health significance^{11,12}. Periodontal disease is slowly progressing and is accompanied by unexpected episodes of quick progression. The triggering mechanism for active bone loss has not been clearly explained, but it seems to be correlated with a transition from a typically Gram-positive microflora to the dominance of anaerobic Gram-negative rods^{8,9}.

* Associate Professor of Urology
Department of Surgery
College of Medicine
Jouf University
P.O. Box 2014, Zip code. 72311
Skaka, Aljouf Province
Kingdom of Saudi Arabia
E-mail: mja@ju.edu.sa

There is no local study available in Aljouf , Kingdom of Saudi Arabia regarding the prevalence of erectile dysfunction among adult males. There is little data available regarding the association of male erectile dysfunction and chronic periodontitis.

The aim of the study is to evaluate the prevalence of erectile dysfunction among patients presenting with dental problems.

METHOD

Non-probability consecutive sampling technique was used at 95% confidence level, taking the expected prevalence of erectile dysfunction of 18.4%, the calculated sample size was 923 at 2.5% margin of error⁷.

Patients attending dental clinical outpatient departments were included in this study. A total of 983 patients received a complete dental examination and completed the questionnaire.

The inclusion criteria were patients attending dental outpatient department, >18 years old, and having chronic periodontitis or any chronic condition. Patients who refused to participate, <18 years old, or not having any kind of chronic diseases were excluded from the study.

An Arabic translation of IIEF-5 Questionnaire (SHIM) was used for data collection. The questionnaire included age, main complaint, smoking habits, diabetes mellitus, hypertension, hyperlipidemia, cardiovascular diseases, erectile dysfunction and SHIM scores. The SHIM questionnaire was adopted to explore erectile dysfunction (ED) and evaluate its prevalence. The questionnaire comprised of 5 statements, each scaled on a 6-point scale from zero to five, with an exception of a single statement that is rated on a five-point scale ranging from one to five. The ultimate score, which ranges from 1-25 is yielded through summing up the total scores. A total score higher than 21 indicates normal erectile function, whereas less than 21 indicates erectile dysfunction. The severity of erectile dysfunction is categorized into 4 classes based on the final SHIM score. These classes are severe erectile dysfunction (1-7), moderate erectile dysfunction (8-16), mild erectile dysfunction (17-21), and no erectile dysfunction (equals or higher than 21). Researchers explained the questionnaire to each participant.

Data were entered into SPSS version-18. Mean±standard deviation was calculated for age and SHIM score. Prevalence for each risk factor was calculated. Chi-Square was calculated to figure out any association of ED with various risk factors.

RESULT

A total of 983 male patients with a mean age of 39.1±12.2 years were included in the study, see table 1. One hundred eighty-eight (19.1%) had chronic periodontitis. The mean SHIM score in patients with chronic periodontitis was 18.3±4.8 while in patients without chronic periodontitis the mean SHIM score was 22.6±2.6 (P-value <0.001 using independent samples t-test).

Table 1: Personal Characteristics

Socio-demographic Characteristics	Total population (n=983)	Population with erectile dysfunction (n=309)
Age in years (Mean ± SD)	39.1± 12.2	50.1 ± 10.3
Diabetes	107 (10.9%)	68 (22%)
Hypertension	102 (10.4%)	36 (11.7%)
Smokers (Current and former)	295 (30%)	70 (22.7%)
Cardiovascular disease	107 (10.9%)	26 (8.4%)
Dyslipidemia	184 (18.7%)	32 (10.4%)
Periodontitis	188 (19.1%)	77 (25%)
Total	983 (100%)	309 (100%)

The mean SHIM score in all patients was 21.73.6±. Six hundred seventy-four (68.6%) had SHIM score 22 or greater labeled as no erectile dysfunction. Three hundred nine (31.4%) had erectile dysfunction. Twelve (1.2%) had severe erectile dysfunction, 36 (6.4%) had moderate erectile dysfunction while 234 (23.8%) had mild erectile dysfunction, see table 2. Age, diabetes, hypertension, dyslipidemia, smoking, and history of cardiovascular disease was found to be associated with erectile dysfunction in patients presenting to dental clinics, see table 3.

Table 2: Erectile Dysfunction

Characteristic	Category	
SHIM score	Mean ± SD	21.7 ±3.6
SHIM score in patients with (n=188) and without periodontitis (n=795)	Mean ± SD	18.3 ± 4.8, 22.6 ± 2.6 *
	Severe	12 (1.2%)
The severity of erectile dysfunction	Moderate	63 (6.4%)
	Mild	234 (23.8%)
	No	674 (68.6%)
		983 (100%)

* Statistically significant using independent sample t-test and assuming unequal variance

Table 3: Risk Factors and Comorbidities

Characteristic	Erectile Dysfunction	No Erectile Dysfunction	P-value
Periodontitis	188 (19.1%)	59 (6%)	< 0.001*
Mean age in years	50.1 ± 10.3	33.8 ± 9	< 0.001**
Smoking	150 (15.3%)	145 (14.8%)	< 0.001*
Diabetes	118 (12%)	29 (2.9%)	< 0.001*
Hypertension	56 (5.7%)	6 (0.6%)	< 0.001*
Dyslipidemia	42 (4.3%)	41 (4.2%)	< 0.001*
Cardiovascular disease	27 (2.7%)	0	< 0.001***

* Statistically significant using chi square test

** Statistically significant using independent sample t test

***Statistically significant using Fischer exact test

DISCUSSION

In our study, 31.4% of individuals had erectile dysfunction; 1.2% were severe, 6.4% were moderate and 23.8% were mild erectile dysfunction. The mean SHIM score was 21.7 ± 3.6 ; 674 patients (68.6%) had SHIM score 22 or greater labeled as no erectile dysfunction. These results indicate a high prevalence of erectile dysfunction. The study sample was characterized as a diverse sample as the study setting is concerned with providing healthcare services for different kinds of medical conditions. The high prevalence of erectile dysfunction requires a screening program for its detection among adult males presenting with any systemic diseases. This may improve overall health-related quality of life.

It is reported that more than thirty million males in the US experience erectile dysfunction to a certain degree. Fifty-two percent of the subjects of the Massachusetts Male Aging Study had some degree of erectile dysfunction between 40 and 70 years old, 10% having severe ED⁶. Selvin et al found that the prevalence of erectile dysfunction in males >20 years was about 18.4%⁷. Mutagaywa et al found that approximately 55% of the male participants experienced a certain degree of erectile dysfunction; the severity of erectile dysfunction was associated with the progression of age¹³.

In our study, 19.1% of patients had chronic periodontitis (CPD). SHIM score in patients with chronic periodontitis was 18.3 ± 4.8 while in patients without chronic periodontitis the mean SHIM score was 22.6 ± 2.6 . (P-value < 0.001). Yehuda Zadik et al found that 22.9% of male subjects were experiencing erectile dysfunction and 4.3% had cardiopulmonary diseases. Cardiopulmonary diseases had a more significant prevalence rate among males with mild erectile dysfunction (P=0.004) and moderate to severe ED (P-value=0.007) compared to males with no erectile dysfunction¹⁴.

In other studies, chronic periodontitis and erectile dysfunction were found to be associated with each other¹⁵⁻²⁰. Oğuz et al study among young adults, erectile dysfunction was found positively associated with chronic periodontitis¹⁸. Eltas et al concluded that periodontal treatment might be providing further benefits in improving erectile dysfunction²¹.

CONCLUSION

The increased prevalence of erectile dysfunction detected among male patients having dental problems reveals that there is an urgent need to screen for erectile dysfunction in those patients. It might also be summed that there is a significant association between both erectile dysfunction and chronic periodontitis. The present study recommends conducting an awareness campaign to increase community awareness in general, and individuals having chronic conditions and its association erectile dysfunction.

Authorship Contribution: The corresponding author made the whole effort contribution towards (1) conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content, and (3) final approval of the manuscript

version to be published. Yes.

Potential conflict of interest: None.

Competing interest: None.

Sponsorship: None.

Acceptance Date: 27 September 2020.

Ethical Approval: Approved by the Institutional Ethical Committee, Local Committee of Bioethics of Jouf University No. (13-25-7/40).

REFERENCES

1. Emanu JC, Avildsen IK, Nelson CJ. Erectile Dysfunction after Radical Prostatectomy: Prevalence, Medical Treatments, and Psychosocial Interventions. *Current Opinion in Supportive and Palliative Care* 2016; 10(1):102-7.
2. Derosa G, Romano D, Tinelli C, et al. Prevalence and associations of Erectile Dysfunction in a Sample of Italian Males with Type 2 Diabetes. *Diabetes Research and Clinical Practice* 2015; 108(2):329-35.
3. Ong WL, McLachlan H, Millar JL. Prevalence of Baseline Erectile Dysfunction (ED) in an Australian Cohort of Men with Localized Prostate Cancer. *The Journal of Sexual Medicine* 2015; 12(5):1267-74.
4. Hassan A, Aburish K, Sheikh TJ, et al. Prevalence of Erectile Dysfunction among Saudi Type 2 Diabetic Patients. *European Review for Medical and Pharmacological Sciences* 2014; 18(7):1048-57.
5. Olugbenga-Bello AI, Adeoye OA, Adeomi AA, et al. Prevalence of Erectile Dysfunction (ED) and its Risk Factors among Adult Men in a Nigerian Community. *The Nigerian Postgraduate Medical Journal* 2013; 20(2):130-5.
6. Rosen RC, Fisher WA, Eardley I, et al. The Multinational Men's Attitudes to Life Events and Sexuality (MALES) Study: I. Prevalence of Erectile Dysfunction and Related Health Concerns in the General Population. *Current Medical Research and Opinion* 2004; 20(5):607-17.
7. Selvin E, Burnett AL, Platz EA. Prevalence and Risk Factors for Erectile Dysfunction in the US. *The American Journal of Medicine* 2007; 120(2):151-7.
8. Smith MM, Knight ET, Al-Harhi L, et al. Chronic Periodontitis and Implant Dentistry. *Periodontology* 2000 2017; 74(1):63-73.
9. Holtfreter B, Albandar JM, Dietrich T, et al. Standards for Reporting Chronic Periodontitis Prevalence and Severity in Epidemiologic Studies. *Journal of Clinical Periodontology* 2015; 42(5):407-12.
10. Kassebaum N, Bernabé E, Dahiya M, et al. Global Burden of Severe Periodontitis in 1990-2010: A Systematic Review and Meta-regression. *Journal of Dental Research* 2014; 93(11):1045-53.
11. Pejčić AS, Mirković DS, Obradović RR, et al. Periodontal Medicine: The Emergence of a New Branch in Periodontology. *Acta Stomatologica Naissi* 2016; 32(73):1584-94.
12. Minkle Gulati VA, Jain N, Anand B, et al. Essentials

- of Periodontal Medicine in Preventive Medicine. *International Journal of Preventive Medicine* 2013; 4(9):988.
13. Mutagaywa RK, Lutale J, Aboud M, et al. Prevalence of Erectile Dysfunction and associated Factors among Diabetic Men Attending Diabetic Clinic at Muhimbili National Hospital in Dar-es-Salaam, Tanzania. *The Pan African Medical Journal* 2014; 17:227.
 14. Zadik Y, Bechor R, Galor S, et al. Erectile Dysfunction Might Be associated with Chronic Periodontal Disease: Two Ends of the Cardiovascular Spectrum. *The Journal of Sexual Medicine* 2009; 6(4):1111-6.
 15. Uppal RS, Bhandari R, Singh K. Association between Erectile Dysfunction and Chronic Periodontitis: A Clinical Study. *Indian Journal of Dental Research: Official Publication of Indian Society for Dental Research* 2014; 25(4):430-3.
 16. Liu LH, Li EM, Zhong SL, et al. Chronic Periodontitis and the Risk of Erectile Dysfunction: A Systematic Review and Meta-analysis. *International Journal of Impotence Research* 2017; 29(1):43-8.
 17. Wang Q, Kang J, Cai X, et al. The Association between Chronic Periodontitis and Vasculogenic Erectile Dysfunction: A Systematic Review and Meta-analysis. *J Clin Periodontol* 2016; 43(3):206-15.
 18. Oguz F, Eltas A, Beytur A, et al. Is There a Relationship between Chronic Periodontitis and Erectile Dysfunction? *The Journal of Sexual Medicine* 2013; 10(3):838-43.
 19. Keller JJ, Chung SD, Lin HC. A Nationwide Population-based Study on the association Between Chronic Periodontitis and Erectile Dysfunction. *J Clin Periodontol* 2012; 39(6):507-12.
 20. Sharma A, Pradeep AR, Raju PA. Association between Chronic Periodontitis and Vasculogenic Erectile Dysfunction. *Journal of Periodontology* 2011; 82(12):1665-9.
 21. Eltas A, Oguz F, Uslu MO, et al. The effect of Periodontal Treatment in Improving Erectile Dysfunction: A Randomized Controlled Trial. *J Clin Periodontol* 2013; 40(2):148-54.