Association Between Erectile Dysfunction and Type 2 Diabetes Mellitus

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ABSTRACT

Background: Erectile dysfunction is a distressing complication of diabetes among male patients. Despite being a serious concern affecting sexual health, the issue regarding sexual dysfunction is seldom discussed by patients with physicians in developing countries. This study aimed to identify the prevalence of Erectile dysfunction and its association with other risk factors among type 2 Diabetic males attending the tertiary care hospital in Nepal.

Methods: A cross-sectional hospital-based study was carried out in the Diabetes Out Patient Department of Tribhuvan University Teaching Hospital, Kathmandu, Nepal. 160 male patients with a history of Type 2 Diabetes Mellitus (T2DM) meeting the inclusion criteria were enrolled in the study with informed consent. A validated questionnaire; an abridge 5 item version of the International Index of Erectile Function (IIEF 5) was used to assess the erectile function where the score below 22 was considered as having erectile dysfunction. The severity of erectile dysfunction was categorized based on IIEF 5 score.

Results: The prevalence of erectile dysfunction with varying degrees of severity was found to be 76.87% among T2DM male patients. There was a significant negative correlation of the IIEF5 Score with the duration of T2DM burden (r= -0.416, p<0.05) and the level of HbA1c (r= -0.391, p<0.05).

Conclusions: There was a higher prevalence of erectile dysfunction among T2DM male patients that were also associated with poor glycemic control and the duration of T2DM burden.

Keywords: Erectile dysfunction; international index of erectile function; type 2 diabetes mellitus

INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is currently a high-burden chronic progressive disease in Nepal affecting many parts of the body.[1-3] Erectile dysfunction (ED) in men is the persistent inability to achieve and maintain a sufficient erection to permit satisfactory sexual intercourse.[4] In Diabetic men, ED usually occurs as a result of microvascular changes, neuropathy and endothelial dysfunction.[5] The International Index of Erectile Function an abridged 5-item version (IIEF-5) questionnaire is a five-point scale diagnostic tool to assess a man's erectile function where the IIEF-5 score below 22 denoted ED.[6] The issue of T2DM and ED has modest consideration in the developing world where diabetic patients and physicians do not take into consideration in sharing about sexual health.[7,8] With this consideration, the study has aimed to identify the prevalence of ED among diabetic men along with other associates among patients visiting the tertiary care hospital of Kathmandu, Nepal.

METHODS

This cross-sectional hospital-based study was conducted among diabetic male patients visiting the Diabetes Out Patient Department of Tribhuvan University Teaching Hospital, Kathmandu, Nepal from January 2019 to December 2019. Ethical approval for the study was granted by the Nepal Health Research Council (NHRC) National Ethical Guidelines for Health Research in Nepal (Reg. no. 113/2019).

The sample size was calculated based on a previous similar study using a prevalence formula with a prevalence of 11.85%[9] at a 95% Confidence Interval and a 5% margin of error. The minimum sample size calculated for this study was 160. The male patients with a history of type 2 DM were included in the study. Since the study was based on sexual health, the study included diabetic married patients or those living in a stable relationship to justify the answers to the questionnaire on sexual performances. Most of the diabetic patients often presented with hypertension, so the study also included

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diabetic male patients having a history of hypertension. The patients with a history of psychiatric problems, cardiovascular diseases, renal diseases, endocrinal diseases, neurological disorders, surgery patients, patients under steroid therapies, medications, drugs and other chronic diseases altering erectile function were excluded from the study. The informed written consent was taken from the respondents before proceeding with the study. The data collection was done by face-to-face interview using a pre-structured questionnaire for obtaining patient's detail required for the study. A validated questionnaire, an abridged 5-item version of the International Index of Erectile Function (IIEF-5), was used to assess ED where the score below 22 was considered as having ED and the severity of ED was categorized based on IIEF5 score.

The collected data were entered into the Microsoft Excel program and then transferred to IBM SPSS Statistics 21.0 version (Statistical Package for Social Science for Windows version: SPSS, Inc., Chicago, IL) for statistical analysis. The association and correlation between the variables were analyzed using non-parametric tests. The p-values <0.05 were considered statistically significant where the confidence interval was set at 95% (95% CI).

RESULTS

The mean age of the study population was 45.06±8.53 years with a mean IIEF5 score of 17.48±4.69. The prevalence of ED (IIEF5 score below 22) with varying degrees of severity was found to be 76.87% as presented in Figure 1.
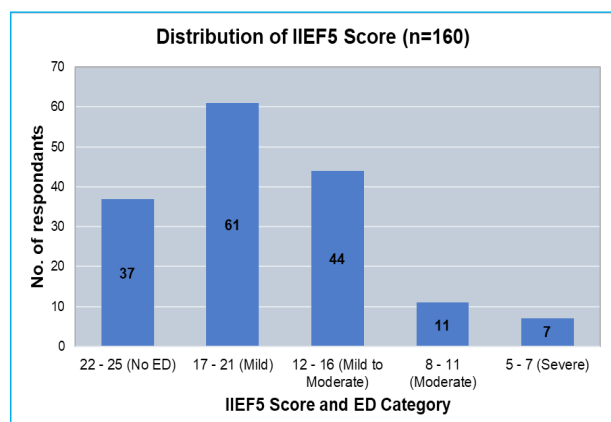

Figure 1. Distribution of IIEF Score among the study population.

The presence of ED was seen among patients having poor glycemic control and duration of T2DM burden (p<0.05) (Table 1). The severity of ED (reduction of IIEF5 score) was statistically significant with a prolonged history of T2DM burden (p<0.05) (Table 2).

Table 1. Comparison of mean among various parameters with Erectile Function.

	Erectile function	n	Mean ± SD	Mean Rank	p value
BMI	Normal Erectile function	37	25.55 ± 3.57	82.64	0.74
	Erectile Dysfunction	123	25.30 ± 3.12	79.86	
Waist (cm) Circumference	Normal Erectile function	37	89.78 ± 8.70	84.49	0.54
	Erectile Dysfunction	123	89.15 ± 7.84	79.30	
HbA1c (%)	Normal Erectile function	37	6.80 ± 1.33	46.80	<0.05*
	Erectile Dysfunction	123	8.64 ± 2.57	90.64	
Duration of DM (Years)	Normal Erectile function	37	2.32 ± 2.29	55.49	<0.05*
	Erectile Dysfunction	123	4.93 ± 4.04	88.02	

Mann-Whitney U Test

Table 2. Comparison of mean IIEF Score among Category of Duration of T2DM.

	Category of DM Duration	n	Mean± SD	Mean Rank	p Value
IIEF Score	<5 years	105	18.91 ± 4.05	94.98	<0.05*
	6 – 10 years	37	15.19 ± 4.29	55.16	
	>10 years	18	13.78 ± 5.26	48.14	

Kruskal Wallis Test, Chi-Square value: 30.24

The study did not show any significant relationship between body mass index and waist circumference with erectile function but conferred a negative association between the level of HbA1c and history of diabetes burden with the presence of ED (p-value <0.05) (Table 3).

Table 3. Correlation of IIEF5 score with variables among the study population (n = 160).

		BMI	Waist Circumference (Cm)	Duration of T2DM (Years)	HbA1c (%)
IIEF Score	Pearson Correlation	-0.038	-0.066	-0.416**	-0.391**
	Sig. (2-tailed)	0.635	0.409	0.000	0.000

***. Correlation is significant at the 0.01 level (2-tailed).*

The burden of hypertension among diabetic patients in the study showed significantly increased severity of ED as compared to the patients having only T2DM (p-value <0.05). The study also presented an increased level

of waist circumference among hypertensive diabetic patients (p-value <0.05) (Table 4).

Table 4. Comparison of the mean of various parameters on Illness of T2DM.

	Other illness	n	Mean ± SD	Mean Rank	p value
BMI	Only T2DM	118	25.11 ± 3.36	76.65	0.07
	T2DM with Hypertension	42	26.06 ± 2.70	91.31	
Waist (cm) Circumference	Only T2DM	118	88.58 ± 8.34	74.51	<0.05*
	T2DM with Hypertension	42	91.31 ± 6.78	97.33	
HbA1c (%)	Only T2DM	118	8.04 ± 2.37	76.62	0.07
	T2DM with Hypertension	42	8.70 ± 2.66	91.39	
IIEF Score	Only T2DM	118	18.23 ± 4.32	87.35	<0.05*
	T2DM with Hypertension	42	15.36 ± 5.07	61.26	

Mann-Whitney U Test

The majority of the study population (143) were Non-smoker whereas only 17 were Active Smoker taking at least 1 cigarette per day. There were slightly elevated levels of IIEF5 score among active smokers in the study population with a p-value of 0.95 as compared with non-smokers. A greater proportion of the study population did not consume any form of alcoholic drinks (134) followed by fewer populations (26) consuming alcoholic drinks at least once a week. The statistically insignificant association was shown by the study between alcohol consumption habits and erectile function with a p-value of 0.58 among the study population.

DISCUSSION

To our knowledge, there is very little scientific literature from Nepal regarding ED and this study is the first study to comprehend ED among Nepalese diabetic patients. Although the causes of ED are multifactorial, the primary objective of this study was to find out the prevalence of ED among type 2 diabetic patients and its association with other risk factors such as glycemic control, duration of disease burden, obesity and lifestyle especially smoking and alcohol drinking habits among male patients attending diabetes OPD of TUTH, Kathmandu, Nepal.

Diabetes is the most common disease in nearly all countries and is ranked a high prevalence of morbidity among South Asian nations.[10] Among the numerous complications of diabetes, a sexual health problem in men has drawn significant attention in the present day.[11] The association between T2DM with an ED has drawn trivial concern in developing countries like Nepal where sex is taboo.[12] More often, it is regarded as a normal phenomenon with increasing age.[13] Nevertheless, numerous studies have enlightened the pathophysiology of diabetes behind these sexual problems in men.[14] The prevalence of diabetic ED varies from 32-90% as concluded by many studies where the ED occurs as the first symptom of diabetes in 12-30% of males.[15]

In our study, the prevalence of ED among diabetic patients was shown to be 76.87% (95% CI) which was higher than the findings from the studies done at various parts of the world. These studies from various countries like the studies by Rakovac T. et al.[7] in Ireland screened 59.0%, Mushtaq S. et al.[9] in Pakistan showed 62.5%, Minami H. et al.[16] in Japan presented 64.6%, Fillo J. et al.[17] in the Slovak Republic reported 74.70%, Chen S. et al.[8] in China documented 58.51%, Furukawa S. et al.[18] in Japan showed 43.20%, Mazzilli R. et al.[19] in Italy showed 19.5% and Sharifi F. et al.[20] in Iran presented 59.5% prevalence ED which was lower than the finding of this study. However, the prevalence reported in studies done by Basat S. et al.[15] in Turkey showed 78.57%, Bansal D. et al.[21] in India screened 81.25%, Novo S. et al.[22] in Italy demonstrated 80.0%, Saghier E. et al.[23] in Egypt reported 85.7%, Hassan A. et al.[24] in Saudi Arabia screened 86.7%, Goyal A. et al.[6] in India presented 77.20% and Ahmed I. et al.[25] in Northern Pakistan presented 97.2% that were higher than the findings of this study. The comparative prevalence of the Nepalese population with other parts of the world supported the finding of a study done by Rakovac T. et al.[7] which stated the reluctance of sharing a sexual problem with the physician until the physician asked for it. There might be various socio-economic factors, cultural backgrounds as well as education and perception of people that differentiate this variation in results. Though the patients were having ED, they were not having screened or tested for sexual health which was revealed only during screening done in this study. This study has exposed underdiagnosed cases of ED and represented a significant problem of Nepalese diabetic male patients. The hindrance in sex talks might have dominated the men's sexual health that ultimately deteriorates the quality of life in developing countries like Nepal.

The study also presented a significant negative correlation of IIEF5 score with the duration of T2DM burden and glycated hemoglobin. These findings might suggest the impact of various diabetic complications like poor glycemic control and progression of diabetes were related to erectile function. The progression of diabetes with microvascular abnormalities leading to ED was also reported in the study done by Mikhalichenko et al.[26] The

study also showed an association between increased waist circumference with ED and similar findings were presented by Fillo et. al's study.[17]

The study showed a significant reduction in IIEF5 score (p = 0.002) with the presence of diabetic hypertension among the study population which was consistent with the findings from the study led by Ledda et al.,[27] Seftel et al.[28] and Giuliano et al.[29] The neurogenic and endothelium-mediated penile smooth muscle relaxation impairment in diabetes and hypertension exacerbate the progression in ED.

The effect of smoking and alcohol consumption has also been shown as the causes for ED. The findings of Furukawa et al.[18], Chao et al.[30] and Zedan et al.[31] have concluded the association of ED with smoking and drinking habits. In our study, the diabetic patients were categorized into active consumers and non-consumers of smoking and alcohol. The active smokers (17 out of 160) in our study consumed at least 1 cigarette per day whereas active alcohol users (26 out of 160) consume alcoholic drinks once a week and our study findings showed no significant association between ED and these habits. Less number of respondents falling in active-users might be the reason for not supporting the findings of the previous studies.

In summary, to our knowledge, this study could be the very first study to address men sexual health relating to diabetes and erectile function in the context of Nepal. The higher prevalence also implied the need for a further vague study that could buttress the present findings. Since this is a single-center study, this study may not represent the entire community to set definitive conclusions and recommendations.

CONCLUSIONS

Erectile dysfunction has been an unspoken issue among diabetic men shown by its higher prevalence in the study population. Poor glycemic control and prolonged history of diabetes were also significantly associated with ED among diabetic men.

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