The prevalence of erectile dysfunction at a primary healthcare clinic in Durban, KwaZulu-Natal

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Abstract

Objectives: The objectives of this study were to determine the prevalence of erectile dysfunction (ED) in men attending a primary healthcare (PHC) clinic in Durban, KwaZulu-Natal, and to document any relationship between ED and age, smoking, economic status and co-morbid conditions.

Design: An observational, descriptive, cross-sectional study.

Setting and subjects: More than 50% of men aged 40-70 years experience some degree of erectile dysfunction. However, no data is available on the prevalence of ED in a primary healthcare (PHC) setting in KwaZulu-Natal. Between February and March 2008, 1 300 questionnaires were distributed to men aged 18 years and older with no exclusion criteria, attending a general PHC clinic.

Outcome measures: Responses were captured using a validated structured questionnaire (International Index of Erectile Function-15).

Results: Eight hundred and three questionnaires were eligible for analysis. The overall prevalence rate of ED was 64.9% (621), of whom 14.6% (117) had mild ED, 19.9% (160) moderate ED, and 30.4% (244) severe ED. Erectile dysfunction increased with age, and there was a strong association between ED and economic status and co-morbid conditions.

Conclusion: The prevalence of ED at this urban PHC clinic was high. Increased awareness by doctors working in the clinic may result in improved assessment and appropriate treatment that will enhance patients' quality of life.

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Introduction

Erectile dysfunction (ED), defined as the persistent inability to achieve and maintain an erection sufficient to permit satisfactory sexual performance, is reported to be common.[1,2] Recent pharmacological advances in ED management have resulted in an interest in the study of sexual dysfunction. The Massachusetts Male Aging Study (MMAS), a community-based, observational survey of non-institutionalised men in the USA, indicated that up to 52% of males aged 40-70 years have some degree of ED.[3] A meta-analysis of 34 published studies on the prevalence of ED in Asia reported a prevalence rate of 2-81.8%. Age was the most consistent predictor of ED.[4]

Although ED is considered to be benign, and does not result in a total loss of sexual satisfaction, it often negatively affects personal relationships and contributes to anxiety, stress, depression and low self-esteem.[5] ED is often assumed to be a natural aspect of ageing, and therefore a condition that must be accepted. Many doctors are not adequately skilled in its detection or management.[6] ED may occur as a result of illnesses, such as diabetes mellitus[7] and coronary artery disease,[8] or from the treatment of diseases, such as hypertension.[9] Organic causes of ED are more common in elderly patients, while those of a psychogenic origin are important contributors to the condition in younger men.[10] Psychogenic ED can be caused by a number of problems, such as performance anxiety, fear, guilt, depression or relationship problems.[5] Management of ED requires accurate assessment and recognition by both patient and doctor that ED is only part of overall male sexual dysfunction, and that psychological, as well as organic components and personal circumstances, need to be considered when evaluating the causes of ED.

Both national and local surveys of the prevalence of and risk factors for ED are important in helping doctors develop appropriate guidelines on sexual counselling and management of ED in their practices. Screening for ED may also provide an opportunity to detect associated risk factors and initiate interventions that may enhance patients' quality of life and longevity.[8,11] No data is available on the prevalence of ED in a primary healthcare (PHC) setting in KwaZulu-Natal. Therefore, this study aimed to fill this gap, and to document any relationship between ED and age, smoking and occupational status, and co-morbid conditions, such as diabetes mellitus, hypertension, ischaemic heart disease and depression.

Method

This was an observational, descriptive, cross-sectional quantitative study of men attending a PHC clinic at a district hospital in Durban, KwaZulu-Natal. Approximately 2 000 males, aged 13-99 years, attend the general PHC clinic every month because of a variety of acute and chronic medical conditions. Men aged > 18 years who agreed to participate in the study were included between February and March 2008. Exclusion criteria were age < 18 years and any neurological disorder, resulting in a sample size of 1 300 men, based on 4% marginal precision. Data were collected over four days, randomly selected per month, over a two-month period. On the selected days, every third male patient who presented at the clinic, who met the inclusion criteria, was approached to participate in the study. Signed consent was obtained from participants and data was collected using a self-administered, validated questionnaire. Participants completed the questionnaires in private and returned them to the researcher in sealed envelopes.

The questionnaire was based on the International Index of Erectile Function-15 (IIEF-15), which is a psychometrically valid and reliable instrument that is widely used to evaluate male sexual function.[12] As many of the patients attending the PHC clinic were *isiZulu* first-language speakers, the IIEF-15 questionnaire was translated into *isiZulu* and then translated back into English to identify any translation errors. Twenty patients, who were not part of the main study, participated in a pilot study to validate the *isiZulu* version of the IIEF-15 questionnaire. Completed questionnaires were entered twice into a computerised database to check for errors and internal consistency. ED was defined as a score of ≤ 25 obtained from the IIEF-15 (questions 1-5), as proposed by Rosen et al.[13] In this study, an IIEF-15 score of > 25 was considered to indicate no ED, while a score of 17-25 indicated mild ED, 11-16 moderate ED, and 6-10 severe ED. Ethics approval for the study was obtained from the University of KwaZulu-Natal Biomedical Research Ethics Committee (BF087/07), the hospital management and the Department of Health, KwaZulu-Natal.

Results

A total of 1 300 questionnaires were distributed during the study period, of which 803 were eligible for analysis, giving a completion rate of 62%. The remainder of the questionnaires was unsuitable for analysis because of incomplete or illegible data. The demographic data are presented in Table I. Most participants (73%) were < 50 years of age. Only one quarter (23%) had an income of > R5 000 per month, nearly two thirds (61.8%) smoked, and one third (34.2%) had hypertension.

Table I: Demographics, occupation, income and co-morbid illness in the 803 study participants

Demographic information	Number (%)
Age	
18-29	185 (23)
30-39	190 (23.7)
40-49	211 (26.3)
50-59	94 (11.7)
60-69	82 (10.2)
≥ 70	41 (5.1)
Occupation	
Employed	410 (51.1)
Unemployed	393 (48.9)
Income (Rands/month)	
< 5 000	699 (87)
> 5 000	104 (13)
Co-morbid illness	
Diabetes	176 (21.9)
Hypertension	275(34.2)
Cardiovascular disease	61 (7.6)
Depression	86 (10.7)
Smoking	
Yes	496 (61.8)
No	307 (38.2)

The overall prevalence of ED in this study was 64.9%. The men aged 30-39 years were least affected (45%) and those > 50 years were most affected (> 78%).

Data on the association of ED with age are presented in Table II.

Data for the association of ED with chronic illness, smoking and income are presented in Table III.

Discussion

Although there is a wide variation in prevalence rates of ED throughout the world, studies have shown a consistent association between advancing age and ED.[14] The 64.9% overall prevalence of ED recorded in this study indicates that ED is common in this population group. There was

Table II: Association of erectile dysfunction with age

Age group (years), no of respondents in age group	Degree of ED (IIEF-15 score)				Prevalence of ED (≤ 25) (%)
	No ED (> 25)	Mild (17-25)	Moderate (11-16)	Severe (6-10)	
18-29 (185)	59	46	34	46	68.8
30-39 (190)	105	28	20	37	44.7
40-49 (211)	79	30	71	41	62.6
50-59(94)	20	3	32	39	78.8
60-69 (82)	11	8	2	61	86.6
≥ 70 (41)	8	2	1	30	80.5
Total	282 (35%)	117 (15%)	160 (20%)	244 (30%)	64.9

ED: erectile dysfunction, IIEF-15: International Index of Erectile Function-15

Table III: Prevalence of erectile dysfunction in relation to chronic illness, smoking and income, and the associated odds ratio

Variable	Degree of erectile dysfunction (number)				OR*
	Normal	Mild	Moderate	Severe	
Diabetes					
Yes	40	9	20	107	OR: 2.13 CI: 1.45-3.15
No	242	108	140	137	
Hypertension					
Yes	52	30	78	115	OR: 3.3 CI: 2.3-4.7
No	230	87	82	129	
Ischaemic heart disease					
Yes	3	1	1	56	OR: 11.65 CI: 3.61-37.5
No	279	116	159	188	
Depression					
Yes	19	17	15	35	OR: 3.62 CI: 2.13-6.25
No	263	100	145	209	
Smoking					
Yes	193	55	91	157	OR: 0.64 CI: 0.45-0.83
No	89	62	69	87	
Income (Rands/month)					
< 5 000	230	103	133	233	OR: 2.01 CI: 1.3-3.01
> 5 000	52	14	27	1	

*: Odds ratio calculated on the basis of no reported erectile dysfunction versus any reported erectile dysfunction
CI: confidence interval, OR: odds ratio

an increasing prevalence of ED with increasing age. This is consistent with the results of other studies, such as the MMAS study, which reported a doubling of ED incidence with each decade after the age of 40 years.[15] Corona et al found that multiple metabolic and haemodynamic abnormalities, as well as other co-morbid conditions in the ageing population, resulted in the progression of atherosclerosis, which led to vascular forms of ED.[10] In our study, the prevalence of ED was high in most age groups. The 45% prevalence in the men aged 30-39 years increased to 81% in those > 70 years. The overall prevalence (64.9%) was higher than expected and considerably higher than the 52% as reported in the MMAS study.[3] (The latter only considered men aged 40-70 years). This requires further investigation to determine the underlying causes.

Diabetes and hypertension are diseases of lifestyle which increase with age. A Spanish study, carried out in 2001, showed an independent and strong association between ED and diabetes, with a prevalence four times greater in men with diabetes than in non-diabetic men.[16] A large study in 2002 that was conducted on non-insulin-dependent men with diabetes in Makkah, Saudi Arabia, showed that 86.1% of the study population had some degree of ED.[17] Although psychogenic factors, such as performance anxiety and depression, can contribute to its aetiology, ED mainly relates to organic causes, such as vasculogenic and neurogenic abnormalities, in patients with diabetes.[18] The finding in our study, which showed a two-times-increased rate [odds ratio (OR): 2.13, confidence interval (CI): 1.45-3.15) of ED in patients with diabetes, compared to non-diabetic patients, is consistent with these international studies. It highlights the need for healthcare providers to explore issues of sexual functioning in all patients with diabetes.

Hypertension, also known to be a risk factor for ED,[17] is caused by arterial narrowing and loss of elasticity which interferes with blood flow to the corpora cavernosa. This can result in a partial or complete inability to obtain an erection. A German study that was conducted in 1999 found a 36% prevalence of ED in patients with hypertension, compared to that of only 16% in normotensive patients.[19] A study in Poland reported on a 67.8% prevalence of ED in patients with hypertension.[20] In our study, ED in patients with hypertension was higher than that reported in these European studies: 81.1% of our patients with hypertension reported some degree of ED. The OR of 3.3 (CI: 2.3-4.7) suggests that men with hypertension are three times more likely to experience some degree of ED than non-hypertensive men. These results may not only result from hypertension complications. Some antihypertensive drugs are also known to cause ED.[9] Patients in this study were not asked about their treatment for hypertension. This is an area that requires further investigation.

Several studies have reported on an association between cardiovascular disease (CVD) and ED.[10,21-23] The associated prevalence of ED in this study was 95.1%, with an OR of 11.65 (CI: 3.61-37.5). The "artery-size hypothesis" of Montorsi et al suggests that on average, ED occurs three years prior to a subsequent cardiovascular event. This is because the smaller penile arteries reach critical narrowing, with associated insufficient blood flow, earlier than the larger vessels.[24] ED and CVD share major risk factors, including age, inactivity, smoking, obesity, hypertension, dyslipidaemia, diabetes and depression, and ED has been shown to be a sentinel risk factor for CVD, even in asymptomatic men.[25] Endothelial dysfunction has been established as the common denominator in the pathophysiology of both CVD and ED,[26] with the latter being regarded as a sensitive indicator of the early signs of endothelial dysfunction.[27]

In this study, the prevalence of ED in patients who reported a previous history of depression was 77.9% (OR: 3.62, CI: 2.13-6.25). While the association of depression with ED is well-established,[3,28,29] the causal relation may be bidirectional. ED can accompany depression, or depression can result from sexual dysfunction.[30]

Some studies have indicated an association between smoking and ED.[10,21] A practice-based study carried out in Denmark reported a higher frequency of ED in smokers compared to that in non-smokers.[31] In the MMAS study, smoking was not associated with ED in the entire study population,[15] but when the effect of smoking was confined to a subgroup of men without diabetes, heart disease or prostate disease, smoking doubled the risk of ED.[32] An association between ED and smoking could not be established in our study. There was a high prevalence of ED in both both smokers (61.1%) and non-smokers (71%).

Erectile dysfunction has been shown to inversely correlate with economic status,[33,34] as was found in this study. ED was more prevalent in men with a lower household income. This study showed that 67.1% of men with an income of < R5 000 per month reported some degree of ED, compared to 50% of men with an income of > R5 000 per month (OR: 2.01, CI: 1.3-3.01). Of the 48.9% of the unemployed sample, the ED prevalence rate was 71%, compared to 59% in the employed group. The psychological effects of unemployment may play a significant role in personal relationships and contribute to the high rate of reported ED. Besides the psychological effect of unemployment on ED, the socio-economic status of patients has been shown to influence the prevalence rate of ED. ED may be precipitated by a combination of lifestyle factors and medical conditions.[35] Higher socio-economic status has been linked with better health according to many studies.[36]

It is difficult to explain the very high prevalence of ED in the men aged 18-29 years recorded in this study. Although the questionnaire that was used did not include specific questioning about human immunodeficiency virus (HIV), it allowed for HIV to be listed under "other illnesses". No responses were received in this category. In retrospect, this may be understandable, as the questionnaire was given to patients attending a general PHC clinic, and many of the men may have been reluctant to disclose their HIV status. With an HIV prevalence rate of 15.7% in males aged 25-29 in KwaZulu-Natal (2008 figures),[37] a significant number of the men in this age group who participated in this study could have been HIV-positive. Zona et al, in a study carried out on 444 HIV-positive men in Italy in 2010, showed that HIV infection increased the risk of ED by 34 times (OR: 34.19).[38] They postulated that this was because of the HIV disease process, but acknowledged that ED could also have been due to antiretroviral therapy, and protease inhibitors in particular, or to psychosocial issues associated with HIV infection. There is a need for further study in this area to confirm the high prevalence of ED in HIV-positive men and to elucidate the underlying cause of their ED.

Bias and limitations

This study relied on self-reporting. The respondents may not have completed the IEFF-15 questionnaire accurately. The questionnaire was long, and as many of the participants did not complete it, they were excluded from the analysis. Possibly, use of the shorter IEFF-15 version might have been more appropriate. This study did not assess the many confounding variables that can influence ED, so the results must be treated with caution.

Conclusion

This observational, exploratory study, the first of its kind carried out at a PHC clinic is KwaZulu-Natal, has shown a high prevalence of ED in all age groups, with an unexpectedly high prevalence in men aged 18-29 years. Doctors need to be aware of the high prevalence of ED in their patients and the association between ED, ischaemic heart disease, diabetes and depression, and to investigate sexual dysfunction appropriately. There is a need for further investigation to determine the role that HIV might play in the high rate of ED in this population group. As the majority of South Africans access healthcare services through PHC clinics, providing appropriate service at these clinics needs to include addressing the problem of ED.

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