ERECTILE DYSFUNCTION AMONG DIABETIC PATIENTS IN SAUDI ARABIA: A HOSPITAL-BASED PRIMARY CARE STUDY

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Objectives: The aim of the present study was to estimate the prevalence of erectile dysfunction in men with diabetes mellitus attending a primary care clinic in King Khalid University Hospital, Riyadh, Saudi Arabia.

Methods: A cross-sectional study was carried out on men with diabetes mellitus followed in a primary care clinic of King Khalid University Hospital in Riyadh, Saudi Arabia, from 13 November 2005 to 13 June 2006. A total of 186 diabetic patients were interviewed. Data collection forms were completed by a member of the medical staff, a family medicine consultant, during the consultation of diabetic patients in the primary care clinic. Erectile dysfunction was categorized as absent erectile dysfunction (normal function), partial erectile dysfunction, and complete erectile dysfunction. The data was analyzed using the Statistical Package of Social Science (SPSS) version 11.5. A p-value of less than 0.05 was considered statistically significant.

Results: A total of 186 men with diabetes mellitus were interviewed during the study period. The majority of diabetic patients (95%) had type 2 diabetes. Most of the patients (68.8%) were on oral hypoglycemic agents, 24.7% on insulin injection, and 6.5% on diet only. The present study showed that 11.2% of the diabetic patients were suffering from complete and severe erectile dysfunction, while 64% of the patients complained of partial erectile dysfunction which was affecting their marital relationship. The cardiovascular risk factors in the 186 diabetic patients were hypertension 34.9%, smoking 13.4%, obesity 40%, and dyslipidemia 16.6%.

Conclusions: Complete (severe) and partial erectile dysfunction was quite common among adult diabetic patients in a hospital-based primary care setting in Saudi Arabia. It is important for primary care physicians to diagnose erectile dysfunction in diabetic patients, and to counsel them early, as most patients are hesitant to discuss their concern during a consultation. Further studies are recommended to evaluate the effect of other risk factors on erectile dysfunction in diabetic patients.

Key Words: Erectile dysfunction, diabetes, primary care.
INTRODUCTION
Awareness of Erectile Dysfunction (ED) as a significantly common complication of diabetes has increased in recent years, mainly because of increasing knowledge of male sexual function and the rapidly expanding treatments for impotence. Studies of ED suggest that its prevalence in men with diabetes ranges from 35-75% and 26% in general population. The onset of ED also occurs 10-15 years earlier in men with diabetes than it does in those without diabetes.1 Erectile dysfunction in men is multifactorial in origin: age, smoking, diabetes, heart disease, depression, and hypertension being the major factors.2 Diabetes is associated with accelerated large vessel atherosclerosis, microvascular arterial disease, autonomic neuropathy, dyslipidemia, concomitant hypertension, and prominent endothelial dysfunction. All of these conditions contribute to ED.3 The association between diabetes mellitus (DM) and ED is well established.4 Erectile Dysfunction is an important cause of decreased quality of life in men with diabetes. Impotence can cause great domestic disharmony and may be the basis of many seemingly inexplicable psychological and physical symptoms.5 Erectile dysfunction affects about 100 million men worldwide, particularly in men with diabetes. Its incidence increases with advancing age.2,3 Although around 10% of men aged 40-70 years have complete ED, only a few seek medical help.6

With recent advances in treatment and the growing body of epidemiological research on the cause of the problem, treatment and prevention of ED are possible.7

In Saudi Arabia, a multicenter cross-sectional study of patients with ED attending selected andrology and urology clinics in Jeddah revealed that 30% of the patients had diabetes.8 In Jordan, one study at the National Center for Diabetes in Amman showed that the prevalence of ED among diabetic patients was high at 62%, increasing with age and poor glycemic control.9

The aim of the present study was to estimate the extent of the problem of ED among men with DM attending a primary care clinic in King Khalid University Hospital, Riyadh, Saudi Arabia.

METHOD
A cross-sectional study was carried out on men with DM attending a primary care clinic of King Khalid University Hospital in Riyadh, Saudi Arabia, from 13 November 2005 to 13 June 2006. A total of 186 diabetic patients were interviewed and data collection forms were completed by one family medicine consultant during the consultation of diabetic patients in the primary care clinic. Erectile dysfunction was categorized as absent ED (normal function), partial ED, and complete ED. The collected data was checked and entered into a personal computer. This was analyzed using the Statistical Package of Social Science (SPSS) version 11.5. To construct frequency distribution and cross-tabulation for variables. A p. value of less than 0.05 was considered statistically significant.

RESULTS
A total of 186 men with DM were interviewed during the study period. A majority of diabetic patients (95%) were type 2 diabetes. Their age groups were as follows: 41.9% were between 40 and 60 years, 50% were 60 years and above, 7.5% between 20 and 40 years, and 0.5% between 12 and 20 years. A majority of patients (95.7%) were married. Most (68.8%) were on oral hypoglycemic agents, 24.7% on insulin injections, and 6.5% on diet only. The duration of diabetes was as follows: 25.8% 15 years or more, 16.7%.

Table 1: Erectile dysfunction in diabetic patients (N=186)

| Erectile dysfunction                     | No. (%) |
|----------------------------------------|---------|
| Absent (normal sexual function)        | 42 (22.6) |
| Partial erectile dysfunction            | 119 (64.0) |
| Complete erectile dysfunction           | 21 (11.2) |
| Unknown                                 | 4 (2.2) |
| **Total**                               | **186 (100)** |

Table 2: Glycemic control in diabetic patients (N=186)

| Glycemic control                     | No. (%) |
|--------------------------------------|---------|
| HBA1C:                               |         |
| < 7                                  | 51 (27.4) |
| 7 – <9                               | 55 (29.6) |
| 9 - <11                              | 32 (17.2) |
| 11 and above                         | 5 (2.7)  |
| Not done                             | 43 (23.1) |
| Fasting blood sugar (mmol/L):        |         |
| <6                                   | 39 (21.0) |
| 6 – <8                               | 67 (36.0) |
| 8 - <10                              | 36 (19.3) |
| 10 and above                         | 34 (18.3) |
| Not done                             | 10 (5.4)  |
| 2 hours post prandial (mmol/L):      |         |
| <8                                   | 34 (18.3) |
| 8 - <11                              | 31 (16.7) |
| 11-15                                | 56 (30.1) |
| 15 and above                         | 48 (25.8) |
| Not done                             | 17 (9.1)  |
| **Total**                            | **186 (100)** |
Table 3: Cardiovascular risk factors in diabetic patients (N=186)

| Cardiovascular risk factors | No. (%) |
|-----------------------------|---------|
| Smoking:                    |         |
| Smokers                     | 25 (13.4) |
| Hypertension:               |         |
| Hypertensive                | 65 (34.9) |
| Hypercholesterolemia:       |         |
| Total cholesterol (<5.2)    | 143 (76.9) |
| Total cholesterol (5.2-6.2) | 22 (11.8) |
| Total cholesterol (>6.2)    | 9 (4.8) |
| Not done                    | 12 (6.5) |
| Obesity (Body Mass Index):  |         |
| BMI <25                     | 29 (15.6) |
| BMI 25 - <30                | 80 (43.0) |
| BMI 30 - <35                | 47 (25.2) |
| BMI 35 - <40                | 20 (10.8) |
| BMI >40                     | 7 (3.8) |
| Not done                    | 3 (1.6) |
| 24-hour urine collection for total proteinuria: |         |
| Abnormal                    | 78 (42.0) |
| Normal                      | 41 (22.0) |
| Not done                    | 67 (36.0) |
| Total                       | 186 (100) |

between 10 and 15 years, 24.2% between 5 and 10 years, 32.3% between one and 5 years, and 1.1% were less than one year.

The present study showed that 11.2% of the diabetic patients had complete and severe ED, while 64% of the patients complained of partial ED which had affected their marital relationship. The cardiovascular risk factors among 186 diabetic patients were as follows: 34.9% had hypertension, 13.4% smoked, 40% were obese, and 16.6% had dyslipidemia.

Table 1 shows ED in 186 men with DM followed in a primary care clinic at King Khalid University Hospital. Table 2 shows glycemic controls among diabetic patients. Table 3 shows cardiovascular risk factors: smoking, hypertension, dyslipidemia, and obesity among diabetic patients in the present study.

The study showed that 42% of the diabetic patients had abnormal total proteinuria. Table 4 shows the possible relational effect of other risk factors on ED in 186 diabetic patients followed in the primary care clinic at King Khalid University Hospital, Riyadh, Saudi Arabia.

**DISCUSSION**

Erectile dysfunction can be defined as the persistent inability to achieve or maintain a penile erection sufficient for satisfactory sexual performance. The most important means of diagnosing ED is to obtain a complete medical and sexual history. It is also important to

Table 4: Cross tabulation for the effect of some related risk factors on erectile dysfunction in diabetic patients (N=186)

| Risk Factors                  | Complete ED No. (%) | Partial ED No. (%) | Normal SF No. (%) | Total No. | Chi-square p-value |
|-------------------------------|---------------------|--------------------|-------------------|-----------|--------------------|
| Age:                          |                     |                    |                   | 0.000     |                    |
| <20                           | 0                   | 0                  | 1                 | 1         |                    |
| 20-<40                        | 0                   | 3 (21.4)           | 11 (78.6)         | 14        |                    |
| 40-<60                        | 4 (5.2)             | 58 (75.3)          | 15 (19.5)         | 77        |                    |
| ≥60                           | 17 (18.9)           | 58 (64.4)          | 15 (16.7)         | 90        |                    |
| Duration of DM (years):       |                     |                    |                   | 0.105     |                    |
| <1                            | 0                   | 2                  | 0                 | 2         |                    |
| 1-<5                          | 5 (8.5)             | 37 (56.7)          | 17 (28.8)         | 59        |                    |
| 5-<10                         | 2 (4.5)             | 28 (46.7)          | 14 (31.8)         | 44        |                    |
| 10-<15                        | 4 (12.9)            | 21 (62.9)          | 6 (19.4)          | 31        |                    |
| ≥15                           | 10 (21.7)           | 31 (64.4)          | 5 (10.9)          | 46        |                    |
| Glycemic control (HBA1C):     |                     |                    |                   | 0.660     |                    |
| <7                            | 4 (8.2)             | 33 (61.3)          | 12 (21.5)         | 64        |                    |
| 7-<9                          | 5 (9.3)             | 41 (75.9)          | 8 (14.8)          | 54        |                    |
| 9-<11                         | 4 (12.9)            | 18 (58.1)          | 9 (29.0)          | 31        |                    |
| ≥11                           | 0                   | 4 (80.0)           | 1 (20.0)          | 5         |                    |
| Smoking:                      |                     |                    |                   | 0.246     |                    |
| Smoker                        | 2 (8.0)             | 14 (56.0)          | 9 (36.0)          | 60        |                    |
| Body mass index (BMI):        |                     |                    |                   | 0.031     |                    |
| <25                           | 3 (10.7)            | 17 (60.7)          | 8 (28.6)          | 28        |                    |
| 25-<30                        | 7 (9.0)             | 53 (67.9)          | 18 (23.1)         | 78        |                    |
| 30-<35                        | 4 (8.5)             | 35 (74.5)          | 8 (17.0)          | 47        |                    |
| 35-<40                        | 6 (30.0)            | 6 (30.0)           | 8 (40.0)          | 20        |                    |
| ≥40                           | 1 (14.3)            | 6 (85.7)           | 0                 | 7         |                    |
| Hypertension:                 |                     |                    |                   | 0.077     |                    |
| Hypertensive                  | 11 (17.5)           | 42 (66.7)          | 10 (15.9)         | 63        |                    |

ED=Erectile dysfunction, SF=Sexual function, DM=Diabetes mellitus
distinguish this condition from other sexual dysfunctions such as premature ejaculation and loss of libido.\textsuperscript{10}

Erectile dysfunction is under-recognized, not often discussed and is a commonly untreated complication of diabetes. However, it is also one of the most treatable diabetic complications.\textsuperscript{3} It is a disorder that affects both the patient and his wife. The present study showed that 11.2% of the diabetic patients suffered from complete and severe ED, while 64% complained of partial ED which was affecting their marital relationship.

In the past, patients have underreported this problem because of embarrassment and the belief that not much could be done to alleviate it. The availability and marketing of new therapies for erectile dysfunction have greatly increased public awareness of the problem.\textsuperscript{11} It is estimated that 35-75% of men with diabetes have ED, and compared to age-matched control subjects, men with diabetes develop ED 5-10 years earlier.\textsuperscript{3}

In American men, the incidence of ED increases markedly with age. Between the ages of 40 and 70 years, the probability of complete ED triples from 5.1% to 15\%.\textsuperscript{11} In a cross-sectional survey of 541 men with diabetes at a community-based clinic, in the Massachusetts Aging Male Survey, the prevalence of ED increased progressively with age. The prevalence was 6% in the age group 20-40 years and 52% in the age group 55-59 years. Beyond the age of 60 year, 55-95% of men with diabetes were affected by ED, compared to 50% in an unselected population in the Massachusetts Aging Male Survey.\textsuperscript{3} A study undertaken in Jordan, of 988 married diabetic men at the National Center For Diabetes, Endocrinology and Genetics between January and August 2004 showed the overall prevalence of ED as 62%. The prevalence and severity of ED in that study increased with age, and 7% were already on treatment.\textsuperscript{8}

In Saudi Arabia, a multicenter cross-sectional study of 388 patients who attended 6 andrology and urology clinics within a period of 3 months were subjected to a modified structural interview questionnaire to collect demographic data and risk factors for ED. This revealed that 30% of them were diabetic, 15% hypertensive, and 56% were smokers.\textsuperscript{8} In the present study, the cardiovascular risk factors among 186 diabetic patients were hypertension 34.9\%, smoking 13.4\%, obesity 40\%, and dyslipidemia 16.6\%. Strict glycemic control in diabetes is now strongly emphasized as a result of the large body of evidence indicating that strict diabetic control can delay and reduce the adverse effects of diabetes on multiple systems.\textsuperscript{12-15} The present study showed that 27.4% of the diabetic patients had HBA1C less than 7, while 49.5% of patients had HBA1C \(\geq 7\), and HBA1C were not done for 23.1% of the study sample.

Erectile dysfunction in men with diabetes is correlated with HBA1C, so the lower the HBA1C concentration, the better the mean erectile function score.\textsuperscript{3,12}

The management of diabetes has always been an important part of the work of the general practitioner. For many diabetics, their general practitioner is their only source of health care and is the 'gateway' to other services. Improved knowledge of doctors of the functional and social aspects of diabetes mellitus would, therefore, improve the quality of care for patients.\textsuperscript{5,16} Education, support, and reassurance may be enough to restore sexual function in some patients. In other patients, however, different ED therapies should be tried.\textsuperscript{17-24} Involvement of the wife, even indirectly (bearing in mind the cultural values and belief), in the therapeutic decision is likely to increase the morale, help the patients to accept and cope with their condition.\textsuperscript{25}

In conclusion, ED was quite common among adult diabetic patients in a hospital-based primary care setting. It is important for primary care physicians to diagnose the condition in diabetic patients, and counsel them early, as most patients are hesitant to discuss their concerns during the consultation. Further studies are recommended to evaluate the effect of other risk factors on ED among diabetic patients, and to investigate whether ED is due to psychogenic or organic complication of diabetes mellitus itself.

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