# Erectile Dysfunction in Type 2 Diabetes Mellitus, Epidemiology and Risk Factor

Amer M. Al-Taie[1]*, Sameer R. Oleiwi[1], Kadhim A. Al-Hilali[1], Rafea K. Meteab[1]
[1]Department of Nursing, Alsafwa University College, Karbala, Iraq
Email: amergebish@alsafwa.edu.iq

**Abreact**

**Background**: erectile dysfunction (ED) is a highly prevalent and common disease condition all over the world. It is an increasing health problem, simply because of increasing prevalence of diabetes mellitus (D. M Type 2) and increasing number of geriatric population who were the main risk factors for ED. **Objective:** the study was mainly designed to assess the prevalence of ED and its risk factors associated with D.M Type 2. **Methodology :** two hundred and twenty diabetic men attending the diabetic clinic were studied for the presence of E.D , this included full health assessment to assess sings of E.D and the presence of risk factors associated with (D.M Type 2). Blood and urine test were done plus other non-invasive investigation like ECG and Doppler sonography of the penile arteries. **Results:** erectile dysfunction (E.D) was seen prevalent in D.M and seen increasing as the patient gets older. Several risk factors were studied such as hyperglycemia associated with hypertension, hyperlipidemia and other risk factors such smoking and obesity were also investigated. **Conclusion**: the study showed that (E.D) was common health problem among diabetic patients especially older age groups and these with long duration of D.M, uncontrolled hyperglycemia, hypertension and hyperlipidemia with an overall prevalence of 60%.

Key words: Erectile dysfunction, risk factors, D.M type 2, hyperlipidemia, epidemiology.

## 1. Introduction

Diabetes mellitus is one of the most common chronic disease worldwide, It is increasing in incidence and prevalence to a pandemic behavior.(1)

Erectile dysfunction (E.D) is known as recurrent or persistent inability to get and maintain a penile erection firm enough to perform a satisfactory sexual intercourse, impotence is sometimes applied to the term.( 2), (3), (4), ( 5), (6).

Man is considered impotent if (75%) of his attempts to do intercourse ended with failure. (7).

Erectile dysfunction as a complication of diabetes mellitus (D.M) is increasing in prevalence globally . (8)

The exact etiology of E.D is not fully understood but probably it is multifactorial in which endothelial dysfunction plays a great role. (9)

The known causes of E.D are either neuropathic as in D.M, Multiple sclerosis and pudendal nerve injury or vascular such as atherosclerosis of penile arteries or psychological problems including anxiety and depression or drugs e.g Beta blockers and thiazides etc..(10), other important causes are reduced desire (libido) which occurs in depression and hypogondism, physical inactivity, old age, debilitating disease, excessive alcohol consumption, smoking, overweight and hyperlipidemia are (10)among other causes of E.D. several risk factors are often associated with type 2 D.M including chronic elevation of blood sugar (hyperglycemia)(11), chronicity of D.M (8), hypertension (4), (12), (13), hyperlipedemic which often associated with atherosclerosis and endothelial dysfunction of penile arteries (14) , seftel AD reported in the journal of urology that there is high prevalence of hypertension, hyperlipidemia, D.M, and depression in man with ED. (1)

Erectile dysfunction may appear in diabetes by years (5-15) preceding the occurrence of D.M and the presence of ED in young aged men being suspicious about the presence of D.M in these people 16.

Recent studies demonstrated that men with type 2 D.M have low testosterone level which causes low sex drive, orgasmic dysfunction and erectile dysfunction. 17, 18

Partner relationship difficulties, emotional stress, physical illness, hormonal abnormalities are also factors leading to E.D. 4, 19.

There is an association between D.M, E.D and cardiovascular disease, due to increase LDL lipoprotein and consequent micro and macro vascular disease e.g. coronary artery disease 20, 21, 22, 23.

The prevalence of E.D is strongly related to age in both diabetic and non-diabetic men, but shown more clear in the diabetics e.g. if the prevalence is 29% in the age group (40-49) years, it becomes 74% in the age group (60-69) years 24. Compared with D.M the prevalence would range between 50-60% above the age of 50, to become 95% at the age of 70 years. 25

Generally speaking because the life span of people expands. The number of geriatric is increasing worldwide and consequently, the number of patients with ED is increasing. The same role is applied to men in Arab countries. 26

Malving L.s and Levy JC reported in the journal of sexual medicine , vol.6, issue 5 2009, that chronic poor control of blood sugar causes damage to penile nerves and vessels, also mentioned that ED in diabetes is more resistant to treatment and more severe compared with non-diabetics. 8

doi.org/10.31838/hiv23.03.165 Received: 19.11.22, Revised: 12.12.22, Accepted: 10.01.23.

The prevalence of ED in type 2 DM is higher than in type one D.M. e.g. approximately 66.3% in type 2 versus 37.5% in type one . 27.
Severe ED needs a comprehensive medical assessment whether young or old and managing him accordingly. 28
There are no format tests for the diagnosis of ED, simply it needs full history, spouse interview and meticulus physical examination combined with some blood tests and investigation are practically enough to diagnose ED with confidence specific markers such as E.seleetin in, Interleukin 10 and S.Biomarkers of ED, in DM are very limited and constitute a hope for the future 29.
Various form of treatment are available, medical or surgical. The commonly used oral phosphodiesterase type 5 inhibitors are widely used e.g. Viagra, Cialis etc. other means of treatment such as vacuum device and intraurethral implants and even surgical measures are the last options. 5
There are recent reports based on meta-analysis, which statins with sildenafil drug improve ED compared with sildenafil plus placebo. 30

## 2. Methodology

The number of patients studied were (220) diabetic men attending diabetic clinic in the AL- Hussein Medical city Karbala.. The patients studied were type 2 D.M. the first visit was started on first February 2022 and ended on 30th June of the same year.
Patients with acute illness, chronic debilitating disease, liver, renal, thyroid diseases or spinal cord injuries were excluded from the study. Their ages ranges from 30 years to 70 years, average (58+-2,55) all participants gave informed written consent.
Detailed history was taken from each patient and his partner in frank interview especially concentrating on sexual history e.g. the state of penile erection whether in the morning or after sexual arousal, etc…
Detailed smoking history was also taken. Physical examination was then started looking for signs of hypogondism, testicular size and any penile abnormalities. The patients' blood pressure was then checked twice in sitting position with a 10- minutes interval of rest. The average was taken. Any reading at or above 140/90mmHg was considered high.
The Body Mass Index (BMI) was then estimated through taking the weight in kgs and height in square meter through the Unicef scale. The BMI calculated by dividing the weight on height. any value of 25 or over was regarded as overweight.
The patient was then sent to the laboratory for blood testes e.g., FBS, RBS, CBC, serum electrolytes, glycated hemoglobin (HbA1c), serum creatinine, blood urea and thyroid function tests. In some cases hormonal assay was needed e.g. S. testosterone, S. prolactin and S.L.H. sometimes we did penile Doppler sonography. All patients were also sent for ECG.
Ultimately all data were collected and subjected to statistical analysis using SPSS software program. The study was done in respect of human rights guideline.

## 3. Results

The total number of diabetic men were 220 . their ages range from 30 years to 70 years with an average of 58+-2.5 SD.
The duration of diabetes ranged from few months to more than 20years with an average of 16+-1.6 years. Table (1) shows the relation between the duration of D.M and the prevalence of ED. The longer the duration of D.M the higher would be the number of causes of ED. The study showed that the number of ED patients increased in prevalence as the age advance as seen in table 2
Table 3 shows the relation between the age of the patient, the severity of ED and prevalence of ED, although this relation is not exactly or fully compatible.
Table 4 shows four different studies with their references (sources) and prevalence rate mentioned.
Table 5 shows that different countries show somewhat different prevalence rate.
Table( 6) : shows the prevalence of different risk factors associated with D.M type 2 compared with the prevalence in general population using data collected by WHO in conjunction with Iraq ministry of health under the title of Non-communicable disease risk factors STEP Survey – Iraq -2015.

## 4. Discussion

Diabetes mellitus (D.M) is one of the most common chronic diseases distributed over all world with an increase in its incidence and prevalence 2,5,7.
In USA D.M is the 6th leading cause of death in women and 5th cause in men. 19
It is known that D.M is one of the most common risk factor for ED, and it is documented that there is threefold increase of ED in men with D.M compared with non-diabetics, according to the Massachusetts male aging study 2,31
The international diabetes federation reported that there are about 425million clients with D.M from whom 20-80% have ED in men furthermore the prevalence of ED varies according to different sources, references and probably different countries please look at table 4,5.
Dr. Motiel J etal reported in 2021 that as low as 18.4% in U.S men 20 years or older had ED while Dr. Malavige and Levy reported as high as 35-90 %. 5 compared with non-diabetic people the prevalence reported was 16-25%2, 25.
The annual incidence of age- adjusted ED in diabetic men was twice than in non-diabetic men. 2
There is a link and association between the duruation of D.M (chronicity) and the prevalence of D.M independent of age. 8
And the longer the duration of D.M the higher is the prevalence of ED this phenomenon is seen in the table (1)
There is a strong relationship between erectile dysfunction and advanced ages. 5 .e.g. men aged(50-59) have a 3 to 6 times higher risk of developing ED compared with an age-group (18)-29) years 2,6.

people risky is even higher (6-7) times with men above 70 years, this seen in table (2), which shows a prevalence about 8% about age group (30-39) years, increase to about 49% in the age-group (50-59) years and become dramatically higher (91%) in the age group (60-70) years, it is possible also that there is an increase in the severity of ED with advancing age. Some example seen in table (3).

In addition to age the prevalence of ED may differ from one country or nationality to another e.g. as low as 18.4% in U.S and 19.2% in Germany 32 increase to more than 40% in arab countries 32 to very high level in Pakistan to about 80.8% 33 as shown in table 5.

Hypertension (HTN) is an important risk factor for ED. 4, 13, 14. About 30%of patients with HTN complain of ED, this risk may be due to the high blood pressure or to the drugs used for its treatment. E.g. beta blockers and thiazide4. As seen in table (6)

Hyperglycemia is also a strong risk factor for ED, the prevalence rate of ED increased with higher glycated Hemoglobin (HbA1c)2, poor control of blood sugar for along period cause damage to the penile blood vessels and nerves8 see table (6).

Hyperlipidemia is another risk factor and widely reported because of high level of LDL cholesterol and high level of triglyceride.2.this is seen in table ( 6) which supports it.

Smoking and increased body weight (increased BMI) were reported in many studies as risk factors. In this study there is no clear association supporting it as seen in table (6). Further studies are required to support or deny these findings.

Table (1) The link between the duration of diabetes and the prevalence of erectile dysfunction.

| Prevalence rate percent | Number of patients with Erectile dysfunction | Number of patients with D.M | Duration of D.M in years |
|---|---|---|---|
| 15 | 3 | 20 | 0 -5 |
| 42,8 | 15 | 35 | 6-10 |
| 50,9 | 28 | 55 | 11-15 |
| 73,0 | 46 | 63 | 16-20 |
| 85,1 | 40 | 47 | >20 |
| Over all prevalence rate 60% | 132 | 220 | Total |
| P- value <0.01 | | | |

Table (2) The link between age and erectile dysfunction in type 2 D.M

| Percentage rate % | No. of patients with erectile dysfunction | No. of patients in the sample | Age group in years |
|---|---|---|---|
| 8.33 | 1 | 12 | 30-39 |
| 32.35 | 11 | 34 | 40-49 |
| 48.91 | 45 | 92 | 50-59 |
| 91.46 | 75 | 82 | 60-70 |
| Overall prevalence rate 60% | 132 | 220 | Total |
| P- value <0.01 | | | |

Table (3) The relation between age, severity and prevalence rate of erectile dysfunction with references.

| No. of reference | Prevalence | Severity | | | Age in years |
|---|---|---|---|---|---|
| | | Sever | Moderate | Mild | |
| 32 | >40% | 50% | 40% | 10% | Unidentified age (in general) |
| 32 | 40.9% | 11.4% | 13.5% | 25% | >18 |
| 4 | 25% | Mild to moderate | | | <40 |
| 24 | 29% | 1% | 8% | 20% | 40-49 |
| 4, 12, 13 | 50% | All grades of severity but especially severe | | | 40-70 |
| 24 | 50% | 2% | 23% | %25 | 5059 |
| 2 | 60% | 22.9% | 16.9% | 9% | 35-70 |
| 24 | 74% | 10% | 50% | 14% | 60-69 |
| Increase in prevalence with increased age. Regarding severity there is no definite rule. | | | | | |

Table (5) The relation between age, country home (Nationality ) and prevalence of erectile dysfunction in D.M type 2

| References | Prevalence rate | Age in years | Country |
|---|---|---|---|
| 2 | 60% | 35-70 | Italy |
| 32 | 49.9% | >18 | Jordan |
| 32 | >40 | Unidentified | Arab countries |
| 25 | 95% | >70 | North American men in general |
| 25 | 35-75% | Unidentified | D.M men in general (another study) |
| MX | 3-76.5% | 50 | In various parts of the world |
| 4 | 18.4% | >20 | USA |
| 4 | 25% | <40 | USA (another study) |
| 4, 12, 13 | 50% | 40-70 | In general |
| 32, 33 | 57% | Unidentified (overall) | Nigeria |
| 23, 33 | 63.6% | Unidentified (overall) | Egypt |
| 32,33 | 80.8% | Unidentified (overall) | Pakistan |
| 32 | 19.2% | Unidentified (overall) | Germany |
| 32 | 52% | Unidentified (overall) | USA (another study) |
| 32 | 56% | Unidentified (overall) | Iran |
| MX: reported from Montie J, Gutierrez- Quiroz CT, Perez- Vasque2 AL, Lorie J 2021 | | | |

| Table (4) Prevalence of ED in D.M according to various studies | | |
|---|---|---|
| Reference of the study | Prevalence rate % | Name of the study |
| Schiavi RC, stimmel BB, Mandeli J , RayfieldEJ, D.M and male sexual furection, a controlled study Diabetelogia, 1993, 56:745-51 | 77 | Schiavi RC |
| Assessment of cardiovascular risk in patients with erectile dysfunction focus on diabetic patients, Endocrine 2004,23, 125-9 | 75 | Kloner RA |
| Gar S, Rijihwani P Gupta, Candlewall M, Kumar,Gupta R of erectile dysfunction in type 2 diabetic patients, Int J Health, Blomed Res. 2013, 3:210-6 | 78 | Garg etal |
| Anwar Z, Sinha V, Mitra S, Mishra A.K, Ansari MH, Bharti A etal, Erectile dysfunction an underestimated presentation in patients with D.M, Indian J psychol Med 2017, 39, 600-604 | 76.4 | Anwar etal |

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