

Research Article

Impact of improvement of glycosylated hemoglobin on erectile function in type II Diabetic men with erectile dysfunction

Al Ayman F. Husain, Mamdouh A. Abdel-Raheum, Nady M. Barsoum and Abd El-Rahman F. Abd El-Sattar

Department of Urology, El-Minia Faculty of Medicine

Abstract

Introduction: Worldwide, the affected population with erectile dysfunction (ED) is predicted to increase from 152 millions in 1995 to 322 millions in 2025. **Aim of the work:** The aim of this study was to assess the impact of improvement of glycosylated hemoglobin on erectile function in type II diabetic men with erectile dysfunction. **Patient and Methods:** This is prospective study, which was performed from September 2016 to February 2018 at the department of urology at Minia urology and nephrology hospital. Fifty male patients with ED included in this study and presented at Andrology Outpatient clinic. **Results:** The study was done at Minia Urology and Nephrology University Hospital, fifty participants were enrolled from Andrology outpatient's clinic whose were complaining of erectile dysfunction and diagnosed as type II diabetes mellitus more than 5 years duration, all patients under treatment for glycemic control.

Keywords: glycosylated hemoglobin, type II diabetes mellitus, erectile dysfunction (ED)

Introduction

Worldwide, the affected population with erectile dysfunction (ED) is predicted to increase from 152 millions in 1995 to 322 millions in 2025⁽¹⁾.

The prevalence of ED in cross-sectional studies of diabetic populations is range from 20 to 71%⁽²⁾.

The pathophysiology of diabetes mellitus (DM) is multifactorial and no single etiology is at the forefront. The proposed mechanisms of ED in diabetic patients includes elevated advanced glycation end-products (AGEs) and increased levels of oxygen free radicals, impaired nitric oxide (NO) synthesis, increased endothelin B receptor binding sites and ultrastructural changes, upregulated RhoA/Rho-kinase pathway⁽³⁾.

In diabetic men, peripheral vasculopathy and neuropathy are intimately involved in the development of ED. Chronic hyperglycemia may lead to micro- and macro-vasculopathy, including endothelial dysfunction. Autonomic and peripheral neuro-

pathies also develop commonly in these individuals with poor glycemic control⁽⁴⁾.

The concentration of hemoglobin A1c (HbA1c) in the blood reflects the average glucose over the preceding 8–12 weeks. Thus, HbA1c provides an additional criterion for assessing glucose control that is free of the wide diurnal fluctuations that occur with blood glucose⁽⁵⁾.

Pharmacopenile duplex ultrasonography (PPDU) evaluation in ED has a significant role in determining the cause of ED. The advantages of PPDU include objective, minimally invasive evaluation of penile hemodynamics at a relatively low cost⁽⁶⁾.

DM is associated with a poor response to intra-corporal injection (ICI), low peak systolic velocity (PSV), and poor penile axial rigidity. The findings of the study add to the growing body of data suggesting that ED is associated with DM, a longer duration of DM, poor metabolic control of DM, and the presence of DM-related complications⁽⁷⁾.

Arabic version of the 5-item International Index of Erectile Function (IIEF-5) questionnaire administered to 136 Egyptian men proved to be reliable and valid. It also showed a high degree of specificity and sensitivity among the Egyptian population⁽⁸⁾.

Aim of the work

The aim of this study was to assess the impact of improvement of glycosylated hemoglobin on erectile function in type II diabetic men with erectile dysfunction.

Patient and Methods

This is prospective study, which was performed from September 2016 to February 2018 at the department of urology at Minia urology and nephrology hospital.

Fifty male patients with ED included in this study and presented at Andrology Out-patient clinic.

Our inclusion criteria include:

- (1) Men with diabetogenic erectile dysfunction.
- (2) Men with uncontrolled type II DM.
- (3) HbA1C of the patients more than 8.1.
- (4) Duration of DM more than 5 years

Our Exclusion criteria:

- (1) Controlled diabetes mellitus.
- (2) HbA1C of the patients less than 8.1.
- (3) Men with will known other chronic diseases.
- (4) Duration of DM less than 5 years.
- (5) Non diabetogenic causes of ED

Results

The study was done at Minia Urology and Nephrology University Hospital, fifty participants were enrolled from Andrology outpatient's clinic whose were complaining of erectile dysfunction and diagnosed as type II diabetes mellitus more than 5 years duration, all patients under treatment for glycemic control .

SHIM Score

As regard evaluation of the degree of erectile dysfunction by SHIM score, 31 patients presented with severe ED (62%), 13 patients with moderate ED (26%), 6 patients with mild-moderate ED (12%).

- Severe E.D 31 (62%)
- Moderate. E.D 13 (26%)
- Mild - moderate. E.D 6 (12%)
- Mild E.D 0

Base Line 50 (100%)	
SHIM score	
• severe	31(62%)
• moderate	13(26%)
• mild-moderate	6(12%)
• mild	0

Discussion

DM is one of the most common co-morbidities of ED. The prevalence of ED among diabetic men varies from 20-85% (ranging from mild to complete ED) which occurs at an earlier age than in non diabetic men⁽⁷⁾.

Vascular disease has a central role in diabetic ED, and PPDU assessment of the cavernosal arteries has emerged as a valuable vascular screening tool in impotent patients⁽⁹⁾.

Our objectives were to assess the impact of improvement of glycosylated hemoglobin on erectile function in type 2 diabetic men with erectile dysfunction.

In the present study, we used HbA1c as a measure tool for metabolic control or glycemic control for last 8-12 weeks were done.

Then PPDU were done for patient after consent by injection of papaverine intracorporeal and measure response, ecoghenicity, cavernosal artery diameter before and after

injection, PSV, EDV and RI at 5, 10, 15, 20 minutes.

In our study when we compared erectile function before and after glycemic control only 9 from 50 patients shows improvement on erectile function according to SHIM score but there were no changes in the PPDU parameters after glycemic control.

Colakoglu and co-workers at 1999 found on 34 diabetic patients, 27 had vascular changes (79%) on the penile PPDU and cavernosography/ cavernosometry. Among these pathological vascular changes, venous leakage during erection occurred in 12 patients with diabetic impotence (35%), arterial insufficiency in four (12%) and both venous leakage and arterial insufficiency in 11(32%). Therefore, venous leakage was found alone or with an associated abnormality in 23 diabetic patients (67%). Of these 23 patients there was a complete loss of periodic bursts of spontaneous cavernosal activity (SCA) in 19(83%). This contrasting pattern in these two groups of patients suggests that venous leakage in diabetic impotence is related to autonomic neuropathy.

Summary

ED is a common worldwide clinical problem with tens of thousands of new cases per year. It's prevalence in Egypt is 63.6%. DM is one of the most common comorbidities of ED. The prevalence of ED among diabetic men varies from 20-85% (ranging from mild to complete ED) which occurs at an earlier age than non diabetic men. Elevated HbA1c levels and the associated hyperglycaemia in men with DM have been postulated to decrease NO activity and reduce endothelium-dependent relaxation factors, resulting in increased risk for ED. Level of HbA1c greater than 8.1% has been shown to increase the incidence of ED threefold.

Our objectives were to assess the impact of improvement of glycosylated hemoglobin on erectile function in type2 diabetic men with erectile dysfunction.

Fifty male patients with type 2 diabetes mellitus complaining from erectile dysfunction were enrolled.

Exclusion criteria:

controlled DM, HbA1c less than 8.1, men with other chronic diseases, duration of diabetes mellitus less than 5 years. Age of the patients was from 43-68 with mean56.34.

A data collection sheet was filled for all patients. The sheet includes personal, clinical and treatment data. Patients were asked to complete the SHIM score then, PPDU study; all patients were examined using a linear probe (GE, instrument) with 7.5-MHz frequency, by ICI of 10 µg papaverine. Glycemic control was measured by glycosylated hemoglobin (HbA1c) and to exclude controlled patients.

Results of this study showed that when compared SHIM score basically and after glycemic control we found that there is significant improvement, but when compared PPDU parameters basically and after glycemic control we found that there is no statistically significant improvement. In diabetic men higher HbA1c levels (poor control) had a more severe ED, it was found a significant relation between poor control of DM and the following: a poor response to ICI, increasing EDV values and decrease RI, Also it was found that significant relation between increase duration of DM and the following decreased PSV and decrease RI, increased EDV, decrease incidence of erectile function improvement even after glycemic control. Also it was found that younger patients with ED tends to be improved after proper glycemic control and lifestyle modification unlike older patients.

References

1. Al-Hunayan A., Al-Mutar M., Kehinde E.O., Thalib L., Al-Ghorory M.(2007): The prevalence and predictors of erectile dysfunction in men with newly diagnosed with type 2 diabetes mellitus. *BJU Int.* 99(1): 130– 134.

2. Bivalacqua T.J., Champion H.C., Hellstrom W.J., Kadowitz P.J. (2000): Pharmacotherapy for erectile dysfunction. *TIPS* .21:484-489.
3. El-Sakka A.I. (2003): Penile axial rigidity and doppler ultrasonography parameters in patients with erectile dysfunction: association with type 2 diabetes. *UROLOGY* .62: 525–531.
4. Garg S., Rijhwani P., Gupta D., Khandelwal M., Kumar K., Gupta R. (2013): Study of erectile dysfunction in type-2 diabetic patients. *International J of healthcare & biomedical research*. 3(1):210-216.
5. Hannan J.L., Maio M.T., Komolova M., Adams M.A. (2009): Beneficial impact of exercise and obesity interventions on erectile function and its risk factors. *J Sex Med*. 6(3): 254-261.
6. Kadioglu A., Erdogru T., Karsidag K., Dinccag N., Satman I, Yilmaz M.T. et al., (1995): Evaluation of penile arterial system with color Doppler ultrasonography in nondiabetic and diabetic males. *Eur Urol*.27(4):311-314.
7. Kostis J.B., Jackson G., Rosen R., Barrett-Connor E., Billups K., Burnett A.L., et al., (2005): Sexual dysfunction and cardiac risk (the Second Princeton Consensus Conference). *Am J Cardiol*. 96: 85M–93M.
8. McCullough A.R. (2008): Rehabilitation of erectile function following radical prostatectomy. *Asian J Androl*. 10(1):61–74.
9. Muneer A., Borley N., Ralph D. (2007): Erectile dysfunction. *European genitor-urinary disease*.93-96. Musicki B., Burnett A.L. (2007): Endothelial dysfunction in diabetic erectile dysfunction. *Int J Impot Res*.19:129-138.