

**Penile Color Doppler Ultrasonography in Patients with Type 2
diabetes Mellitus Presenting with Erectile Dysfunction:
A Single-Centre Experience from Bangladesh**

Dr. Muhammad Shah Alam

Associate Professor of Medicine

Army Medical College Cumilla

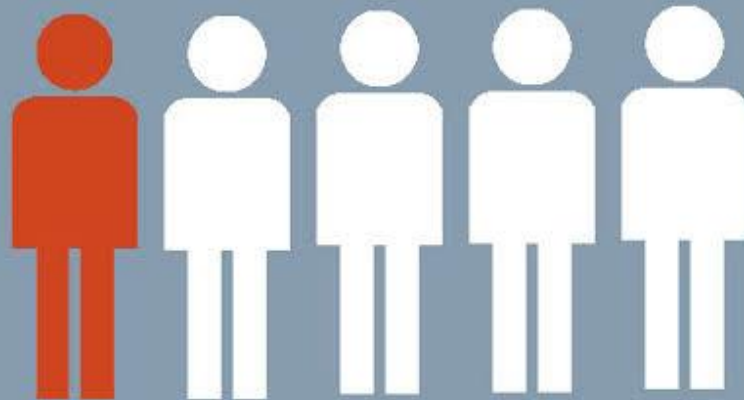
INTRODUCTION

Erectile dysfunction (ED), the most common sexual disorder in men, is “the persistent inability to attain and/or maintain penile erection sufficient for sexual intercourse”.



PREVALENCE

1 in 5 men
ages 40+ suffer from
erectile dysfunction (ED)⁵



- ED is common in diabetes mellitus (DM), with the prevalence of 37.5%,(type 1) 66.3% (type 2)
- Men with DM have a 3.5 times higher prevalence of ED than the general population.
- The risk factors for ED are multifactorial and complex and related to endocrinology, neurology, pharmacology, vascular pathology, or psychogenic.

RISK FACTORS

The risk factors for ED in patients with DM include -

- Advancing age
- Cigarette smoking



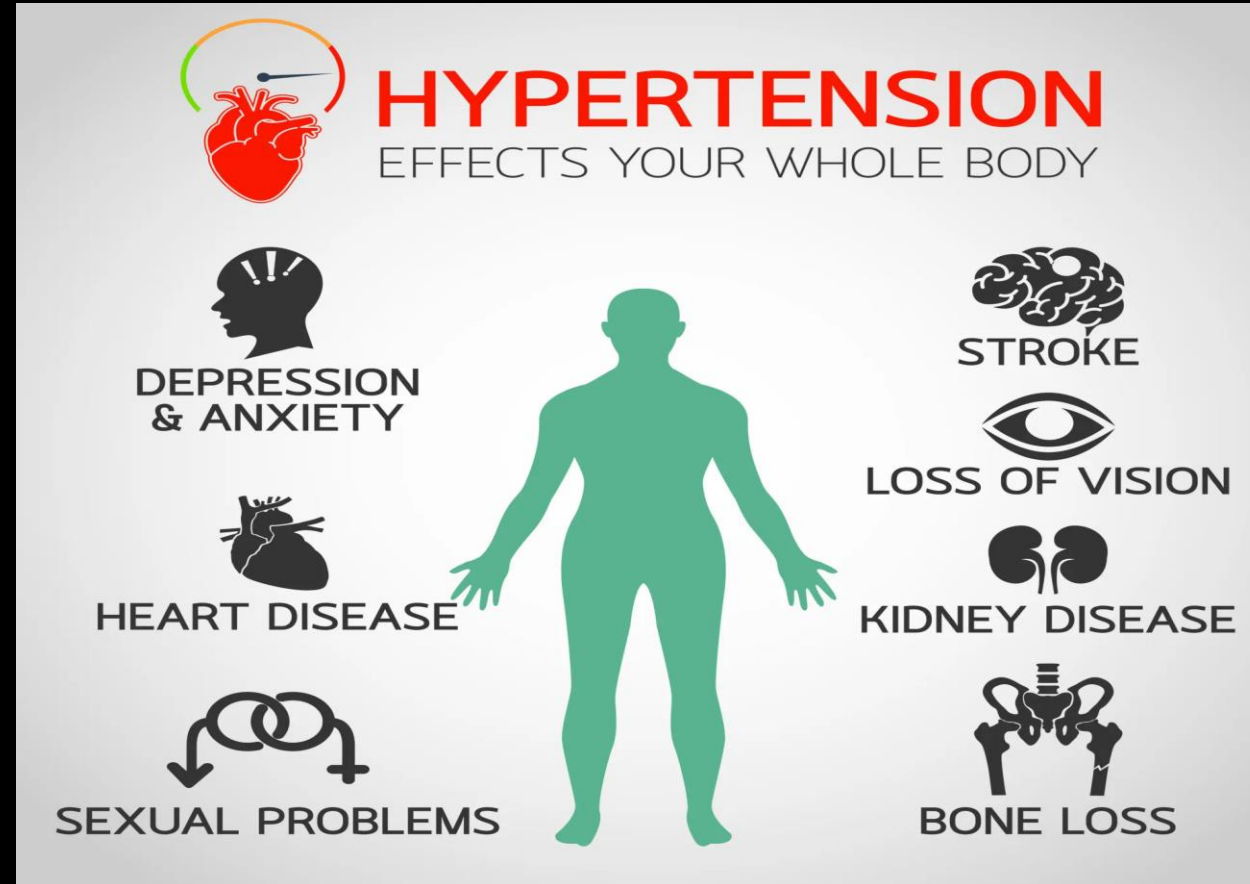
- Drinking Alcohol
- Physical inactivity



- Low education level, High Income
- Fat-rich diets, Obesity, Metabolic syndrome



- Hypertension, heart disease



- Poor glycemic control, longer duration of diabetes
- Testosterone deficiency
- Presence of depressive symptoms , and other diabetic complications including peripheral neuropathy and peripheral vascular disease.

EVALUATION OF ED

Comprehensive medical history, physical examination, and appropriate laboratory biochemical investigations, color Doppler ultrasonography (CDUS) of the penis has emerged as a valuable tool in evaluating ED.

CDUS is a relatively inexpensive and minimally invasive tool for assessing the penile anatomy and flow patterns in the penile blood vessels.

METHODS

This study was conducted from January to December 2022 at specialized diabetes hospital in Cumilla city, Bangladesh.

All participants provided written informed consent before inclusion.

The study population included adult (age ≥ 18 years) males with T2DM having ED.

- ED was diagnosed using the International Index of Erectile Function 5 (IIEF 5) questionnaire using the cutoff score of 21 (range of scores, 5-25).

QUESTIONNAIRE

- 1 How do you rate your confidence that you could get and keep an erection?
- 2 When you had erections with sexual stimulation, how often were your erections hard enough for penetration?
- 3 During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner?

- 4 During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?
- 5 When you attempted sexual intercourse, how often was it satisfactory for you?

- ১। যৌন মলিনরে জন্ম পুরুষ লিঙ্গ শক্ত হওয়া এবং এরকম শক্তাবস্থা ধরে রাখার ব্যাপারে আপনার আস্থা কতটুকু?
- ২। যৌন উত্তেজনার মাধ্যমে আপনি যখন লিঙ্গ শক্ত করেন, তা কতবার আপনার সঙ্গিনীকে প্রবশে করার জন্য যথেষ্ট ছিলি?
- ৩। যৌন মলিনরে সময় সঙ্গিনীকে প্রবশে করার পর আপনি কতবার লিঙ্গে উত্থান বা শক্তাবস্থা ধরে রাখতে সমর্থ ছিলেন?

- ৪। যৌন মলিন সম্পন্ন করত লঙ্গরে উত্থান বা শক্তাবস্থা ধরে রাখা আপনার জন্য কতটুকু কঠিন

ছিল?

- ৫। আপনি যখন যৌন মলিন করেন, কতবার আপনি যৌন মলিনে পরিতৃপ্তি লাভ করেন?

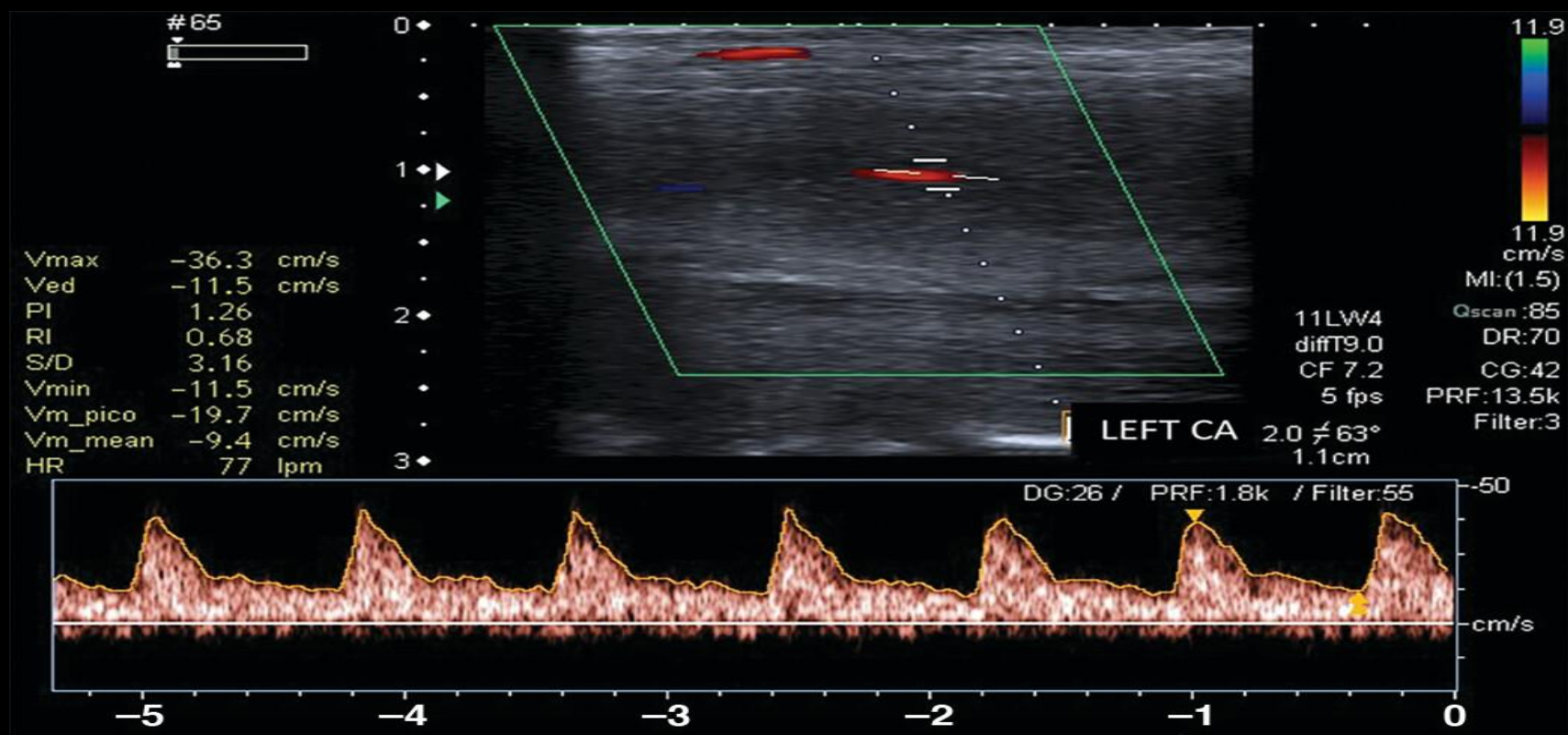
- A fasting venous blood sample was collected, and glycated hemoglobin (HbA1c), fasting lipid profile, and total serum testosterone (TT) were measured.

PENILE DOPPLER PROCEDURE

Doppler study of penile vessels was performed by a single radiologist blinded to the diagnosis using with a high-resolution probe (11Mhz) and the availability of CDUS.

Grayscale USG was performed in the transverse and longitudinal sections to look for any abnormality.

The baseline velocities of the right and left cavernosal arteries were recorded.



- Spectral waveforms from the cavernosal arteries were measured at the penile base .
- Spectral Doppler US findings, including peak systolic velocity (PSV) and end-diastolic velocity (EDV), were recorded.
- The diagnosis was arterial insufficiency if the PSV value was below 25 cm/s during the examination.

STATISTICAL ANALYSIS

We analyzed data using the Statistical Product and Service Solutions (SPSS) version 26.0 software.

RESULTS

Out of 87 subjects having ED, penile vasculopathy was found in 19(21.8%); among them, 15(17.2%) had arterial insufficiency, 2(2.3%) had a venous leak, and another 2(2.3%) had arterial insufficiency with a venous leak .

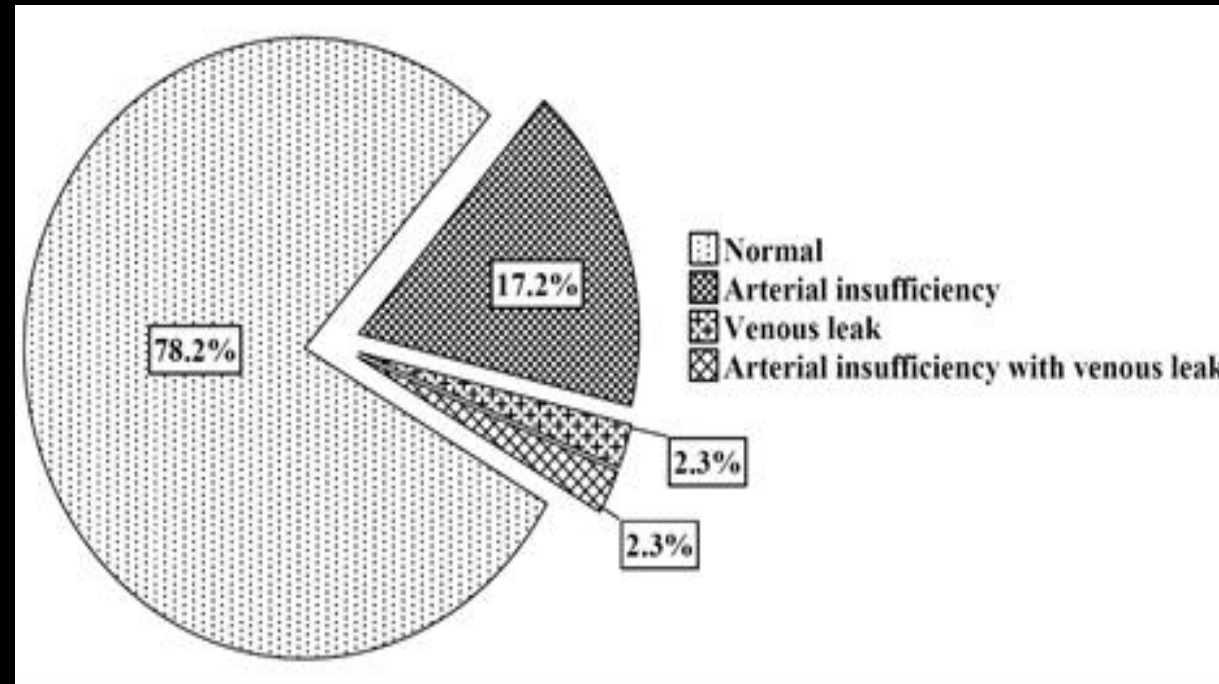


Figure 1: CDUS findings of the study subjects (n=87)

- The comparison of the variables between study subjects with and without penile vasculopathy is given in Table I.
- There were no statistical differences between the two groups except for DBP, which was higher in the penile vasculopathy group.

TABLE I: COMPARISON OF VARIABLES BETWEEN STUDY SUBJECTS WITH AND WITHOUT PENILE VASCULOPATHY :

Variables	All subjects (n=87)	Penile vasculopathy (n=19)	No penile vasculopathy (n=68)	p value
	n (%)	n (%)	n (%)	
Age in years (Mean±SD)	44.2±9.2	45.5±7.2	43.8±9.6	0.477
<i>Age category</i>				
≤40 years	26 (29.9)	3 (15.8)	23 (33.8)	0.163
>40 years	61 (70.1)	16 (84.2)	45 (66.2)	
Duration of DM in years (Mean±SD)	7.9±2.8	7.1±2.3	8.1±2.9	0.161
<10 years	60 (69.0)	15 (78.9)	45 (66.2)	0.403
≥10 years	27 (31.0)	4 (21.1)	23 (33.8)	
Current smoker	27 (31%)	6 (31.6)	21 (30.9)	1.000
BMI (kg/m²)	26.3±2.3	26.3±2.7	26.4±2.2	0.905
Obese	66 (75.9)	14 (73.7)	52 (76.5)	0.770
WC in cm (Mean±SD)	97.0±6.0	97.0±6.0	97.0±6.0	0.774
Central obese	80 (92%)	17 (89.5)	63 (92.6)	0.644
SBP in mmHg (Mean±SD)	133±14	130±13	134±14	0.225
DBP (mmHg)	84.0±8.0	81±6	85±8	0.036
Hypertensive	60 (69.0)	10 (52.6)	50 (73.5)	0.098
On antihypertensive	31 (35.6)	05 (26.3)	26 (38.2)	0.423
HbA1c in % (Mean±SD)	9.3±1.9	9.6±2.2	9.2±1.8	0.419
<i>Glycemic control</i>				
Controlled	09 (10.3)	02 (10.5)	07 (10.3)	1.000
Uncontrolled	78 (89.7)	17 (89.5)	61 (89.7)	
Serum creatinine (mg/dL) Median(IQR)	1.2 (1.0-1.22)	1.2 (0.98-1.3)	1.15 (1.0-1.22)	0.856
TC (mg/dL) Median (IQR)	199 (172-218)	199 (180-224)	200 (167-218)	0.727
LDL-C (mg/dL) Median (IQR)	120 (80-140)	130 (80-142)	117 (82-140)	0.565
HDL-C (mg/dL) Median (IQR)	37 (30-43)	32 (30-46)	38 (30-43)	0.134
TG (mg/dL) Median (IQR)	230 (161-289)	236 (166-338)	230 (159-285)	0.865
Dyslipidemic	84 (96.6)	19 (100.0)	65 (95.6)	1.000
On lipid-lowering drug(s)	26 (29.9)	6 (21.6)	20 (29.4)	0.221
S. TT (nmol/L) Median (IQR)	11.8 (7.1-15.2)	12.5 (9.3-14.7)	10.8 (6.3-15.8)	0.565
Low TT	45 (51.7)	09 (47.4)	36 (52.9)	0.796

CONCLUSION

Penile vasculopathy is not uncommon in patients with T2DM having ED. Penile color Doppler USG is a good tool for differentiating vasculogenic and functional causes of ED and may help physicians choose etiology-specific treatment.







THANKS TO ALL.