To Study the Prevalence Rate of Erectile Dysfunction and Associated Risk Factors in Elderly Male Population

Dr.Sourab Gupta, Dr.Rishabh Malik, Dr. Rohit Nain, Dr. Shreya Saini, Adesh Medical College and Hospital, Ambala, Haryana

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I. INTRODUCTION

Erectile dysfunction is defined as the recurrent or consistent incapability to maintain penile erection for satisfactory sexual performance.[1] Erectile dysfunction (ED) is considered an increasing health concern that has a significant impact on the quality of life of both partners due to lower sexual satisfaction. [2,3] As age increases, the prevalence of ED also increases . ED is a common problem that affects personal interactions , quality of life and well being of the patient and the partner.[4]

The massachusetts Male Aging Study revealed that ED was an inevitable consequence of the ageing process, with the incidence of complete impotence rising from 5% at 40 years of age to 15% at 70 years of age. [5]

However, recent data is lacking regarding the prevalence and risk factors of ED in north india. Hence, our study aimed to determine the prevalence and predictors of ED in north india.

II. MATERIALS AND METHOD:

This was a cross-sectional study to investigate ED among indian men. The study was conducted at 'The Department of surgery, Adesh Medical College and Hospital, village Mohri district kurukshetra. Patients attended the clinics for various reasons such as follow-up appointments, getting medication from the pharmacy, general health check-up, first-time visit for presenting complaint, to accompany their spouse or child, and scheduled outpatient treatments. Participants were the males of age group 40-70 years presenting to the AMCH during the study period , who were in active sexual relationship and with no anatomical malformations of penis. Men with neurogenic ED , active testicular or prostate cancer , men with ED due to radical prostatectomy , prior pelvic surgery were excluded from the study.

Participants were consented to participate in the study after they voluntarily came to the screening grounds for an organized general health check-up. Weight and height were measured with standard scales and BMI calculated by a ratio of weight (in kilograms) to height (in meters) squared. WHO BMI cut-off values were used to define underweight, normal, overweight and obese . Smoking history was sought and participants were categorized as smoker and non smoker. Similarly alcohol intake history was sought and participants were categorized as alcoholic and non alcoholic. Diabetes was diagnosed using FBG $\geq$126 mg/dl. Blood pressure was measured by digital BP machines where a systolic blood pressure (SBP) <120 mmHg and a diastolic blood pressure (DBP) <80 mmHg defined normotension. Pre-hypertension was defined by SBP of 120–139 mmHg or DBP of 80–89 mmHg, while SBP $\geq$140 mmHg or DBP $\geq$90 mmHg indicated hypertension.

DSM-5 criteria was used to determine whether a person was having major depressive disorder.

The validated 5-item version of the International Index of Erectile Function (IIEF-5) Scale was used to assess for erectile dysfunction.[6–9] The IIEF-5 Scale categorizes ED into five categories depending on the score i.e. 22–25: no ED, 17–21: mild ED, 12–16: mild to moderate ED, 8–11: moderate ED, 5–7: severe ED.

The collected data was entered into MS excel worksheet and analysed by using SPSS version 27 . Qualitative data was presented in the form of frequencies and percentage . Chi square test was used to estimate the association between different variables and logistics regression was used to estimate the risk factor for ED . P value <0.05 was estimated as significant.

III. RESULTS:

TABLE 1: PREVALENCE OF ERECTILE DYSFUNCTION

ED	Non - ED	TOTAL
125	105	230

In our study, the prevalence of ED was determined to be about 54% out of 230 participants, while 46% of the patients did not have ED.

| TABLE 2: AGE DISTRIBUTION							
Age group	1-7	8-11	12-16	17-21	22-25	Total ED	Total participants
41-50	5	2	5	3	23	15(39%)	38
51-60	2	4	20	15	36	41(53%)	77
61-70	14	15	29	11	46	69(60%)	115
TOTAL	21	21	54	29	105	125	230

230 people were participated, and 125 of them had ED. 38 out of 230 were aged 41-50 , 77 were aged 51-60 and 115 were aged 61-70. Overall, 54 % (125/230) of men in this study had some form of ED. Of these, 29(12.6 %) had the mild form, 54 (23.5 %) mild-moderate form, 21 (9.1 %) moderate form, and 21 (9.1 %) had the severe form. Prevalence of ED increased with increase in age i.e. 39 % of those aged 41-50 years had ED compared to 60% among those aged 61-70 years As seen in Table 2.

TABLE 3:									
		IIEF					Total	Chi-square value	p-value
		5-7.0	8-11.0	12-16.0	17-21.0	22-25			
AGE GROUP	< 50	14	15	29	11	46	115	18.44	0.018
	51-60	2	4	20	15	36	77		
	> 60	5	2	5	3	23	38		
Total		21	21	54	29	105	230		

As age increases prevalence of ED increases, association of ED with age is statistically significant($p<0.05$)

TABLE 4: RISK FACTORS ASSOCIATION WITH ERECTILE DYSFUNCTION				
Risk factor	Total	ED	Non -ED	P value
Smoking	92	71 (77%)	21(23%)	0.001
Alcohol	100	66(66%)	34 (34%)	0.002
Hypertension	75	48 (64%)	27 (36%)	0.078
Diabetes Mellitus	33	26 (79%)	7 (21%)	0.018

Depression	30	27(90%)	3(10%)	0.001
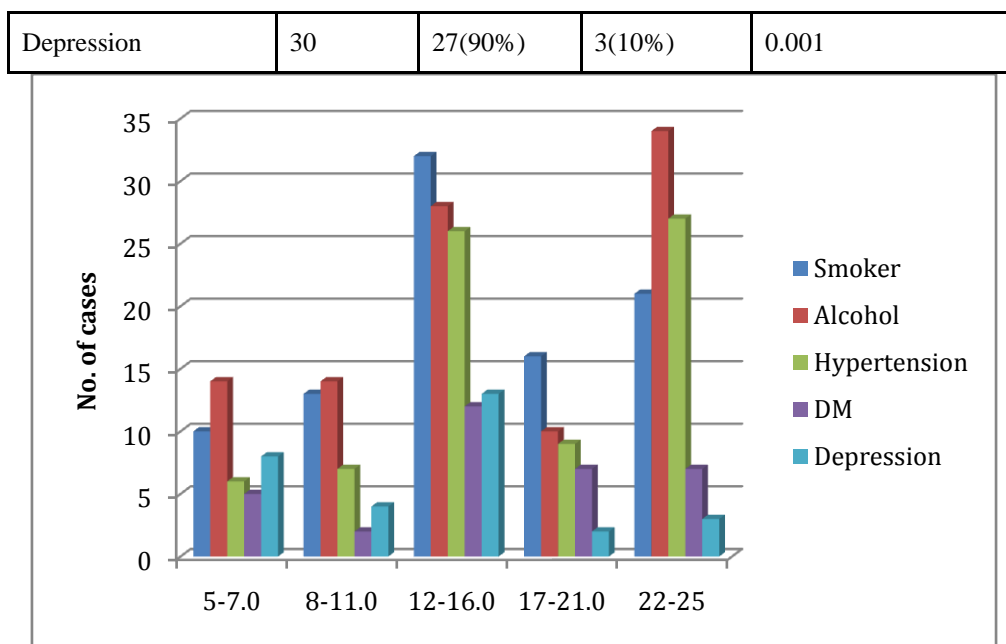
There are numerous risk factors associated to ED. 92 of the 230 participants were smokers, and of those, 77% of the patients experienced ED. Men with a positive smoking history had a increased likelihood for ED compared to never smokers, (p 0.001). Sixty-six percent alcoholics patients had ED (p <0.05). 79 % of men with diabetes had ED compared to non-diabetes(p<0.05).Participants with hypertension had higher ED rates compared to normotensive persons . 90 percent participants with history of depression had ED(p<0.01) .Six variables including age, smoking, alcohol, hypertension, depression and diabetes status underwent bivariate analyses to assess if they have associations with ED. Five variables including age, smoking ,alcohol, depression and diabetes status revealed significant associations.

IV. DISCUSSION:

ED is the most common male medical issue, which is described as a persistent failure to obtain or maintain a penile erection.[10] Aging is associated with comorbidities resulting into atherosclerosis and ultimately vascular dysfunction with ED as one of the manifestations.[11] Age has been consistently shown to be a strong predictor of ED.[12] In our study, the rate of ED among participants aged 61-70 years was 60% compared to 39% in the age group 41-50 years. These findings echo the results of a landmark Massachusetts Male Aging Study.[5] Another study was conducted in Turkey with a study group aged >40; it reported 33% of ED with the majority

(82.9% for those aged ≥70).[13] In a study conducted in New Zealand on men aged 40 to 70 years with the use of the IIEF, the prevalence of ED was 42% and the age-adjusted prevalence was 38% with the highest being 60% in the 60s age group.[14] In our study, the prevalence of ED was determined to be about 54% out of 230 participants. In our study, the prevalence rate increases exponentially as the age advances from less than 50 years to more than 60 years. Similar trend was seen in studies conducted in the past which shows that the prevalence of ED rises with age since it is a natural by-product of ageing.[15] An Australian study conducted in 2006 that showed that smoking cigarettes has a clear association with ED. And after adjusting for any other confounding factors, this association was further reinforced as the number of cigarettes smoked increased. Compared with nonsmokers, the adjusted OR for ED was 1.24 (95% CI, 1.01-1.52, p= 0.04) for those smoking <20 cigarettes per day, and 1.39 (95% CI, 1.05-1.83, p = 0.02) for those smoking >20 cigarettes per day. [16] A dosage response was seen, and as pack years increase, the risk of developing ED also rises.[17] In our study, 71 (77%) of the 92 smokers experienced ED, compared to 21 who did not, which shows highly significant association of smoking with ED. In a prior study, O'Farrell et al. discovered that the prevalence of significant ED was more than three times higher in alcoholic men than in men of similar demographics who were not alcoholics.[18,19] In our study, comparable findings were discovered, as 66% of the 100 patients developed ED. Erection issues are

frequently caused by high blood pressure. According to a study published in the Journal of the American Geriatrics Society, erectile dysfunction affected 49% of males between the ages of 40 and 79 who had high blood pressure.[20] Out of 75 individuals in our study, 64% of the hypertension patients also have ED. According to a research by Defeudis et al., men with type 1 and type 2 diabetes have a prevalence of ED of 26% and 37%, respectively.[21] .However, in our investigation, we discovered that patients with diabetes had a greater prevalence of ED (79% of 33 patients). There is no doubt that depression and erectile dysfunction (ED) are related.[22] 90% of the 30 patients in our study developed ED, confirming a similar link.

Our study provides an estimation of ED prevalence in north india among the married male population and addresses the possible factors that might be associated with it.

V. CONCLUSIONS:

We conclude the following from our study: ED has significant prevalence and severity among adult male outpatient clinic attendees in north india. The factors associated with ED are age, smoking , alcoholism, diabetes and depression . However, in our study, hypertension was not statistically significant. We recommend services for the diagnosis and treatment of ED, especially for those who are smokers, alcoholics, diabetic, history of depression or elderly in primary care clinics, as the diagnosis of ED in india is underestimated.

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