

## Frequency of erectile dysfunction in COPD patients

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### Abstract

**Objective:** Objective of study was to investigate the frequency of erectile dysfunction in COPD patients.

**Methods:** This cross sectional study was conducted in pulmonology department of Nishtar Hospital Multan. 336 outpatients diagnosed as COPD according to Global Initiative of Chronic Lung Disease criteria, were included by non-probability consecutive sampling from February 2016 to august 2016 after taking the approval from ethics committee of the institution. Written consent of the study was signed by all patients. All patients were divided in mild, moderate, severe and very severe form of COPD on basis of FEV1. All patients completed International Index of Erectile Function (IIEF) Questionnaire. Data was analyzed by using SPSS vol 23. Numerical variables like age, BMI and duration of COPD were statistically analyzed by using their mean and

standard deviation and t-test was used to check their significance. Non numerical variables like area of living, income status, smoking status and different stages of COPD were statistically analyzed by using their frequency and chi square test was applied to check the significance. P value <0.05 was taken as significance.

**Results:** Overall, 100% (n=336) male patients were included, in this study. The main outcome variable of this study was Erectile Dysfunction (ED). Classification of erectile dysfunction was noted as no, mild, moderate and severe as 32.7% (n=110), 23.5% (n=79), 16.4% (n=55) and 27.4% (n=92) respectively. Classification of chronic obstructive pulmonary disease (COPD) was observed as mild, moderate, severe and very severe as 5.1% (n=17), 45.8% (n=154), 32.1% (n=108) and 17% (n=57) respectively. No association was found between erectile dysfunction and area (p=0.484), stratified age (p=0.970), stratified BMI (p=0.283), except income (p=0.000) and smoking status (p=0.000)

**Conclusion:** Erectile dysfunction is hidden and under discuss comorbidity in COPD patients. There is significant prevalence of erectile dysfunction in COPD patients. All respiratory physicians should ask and investigate erectile dysfunction in COPD patients. All patients of COPD should be encouraged to share their sexual problems.

**Key words:** COPD, Erectile dysfunction, sexual function

## Introduction

Chronic obstructive pulmonary disease(COPD) occurs mostly in individuals who are exposed to harmful gases, chemicals and particles {1}. COPD is the fifth most common cause of death {2} and it is expected to be the 3<sup>rd</sup> most common cause of death until 2020 {3}. Smoking is considered the major risk factor for the development of COPD {4}. All smokers do not develop COPD. But most of the cases of COPD (ABOUT 90% of them) have smoked. COPD is characterized by persistent air flow limitation {5} and it is preventable and treatable disease. Patients with this disease show increased inflammatory response in lung bronchial tree {6}. This inflammation is not restricted to only lungs but has systemic effects. This is a disease of middle aged and older population. So many co morbidities are seen with COPD. Death in COPD patients are mostly due to cardiovascular events rather than respiratory failure {7}.

Erectile dysfunction is type of sexual dysfunction frequently found in mature and aging men. it is inability to reach or maintain sufficient erection to have satisfactory sexual activity {8}. Many factors result in erectile dysfunction like psychogenic and neural disorders, diabetes, hormonal imbalance, aging, vascular insufficiency, and due to side effects of many drugs. Erectile dysfunction negatively affects person's self -esteem and also quality of life {9}. The mechanism of erectile dysfunction in COPD patients still not clear. Decrease functional capacity due to hypoxemia in COPD is thought to be the reason {10}.

Reports have shown that erectile dysfunction is common co morbidity in COPD patients. It is first reported by Fletcher and Martin in 1980s that 30 % COPD patients have erectile impotence. It is unfortunate that over the last 35 years the connection has been reported but this issue still appears to be largely unaddressed.

we have conducted this study to investigate frequency of erectile dysfunction in COPD patients. It will help to establish the facts about prevalence of this important co morbidity in our geographical area. In future this study will also provide the base for further investigation in this region of world. Study done by Onur Turan et al. in 2015 {20} was taken as reference study.

## Materials and methodology

A cross sectional study was conducted in pulmonology department of Nishtar Hospital Multan. 336 outpatients diagnosed as COPD according to Global Initiative of Chronic Lung Disease criteria, were included by non-probability consecutive sampling from February 2016 to august 2016 after taking approval of the study from ethics committee of the institution. Written consent of the study was signed by all patients. Patients diagnosed as other than COPD pulmonary disorders, low mental status, malignancy, COPD exacerbations in last three months and diabetes were excluded. Patients with abnormal hormonal levels were excluded. All patients with urogenital problems were also excluded. For our study sample size was calculated using reference from a previous study by Onur Turan et al. For which confidence interval was taken as 95 %, power of study 80, 67.7% of COPD patients have varying degree of erectile dysfunction.

All COPD patients enrolled in study was taken from outpatient department. A detailed history of disease, duration of disease and history about any systemic disease was taken. Questions were asked about treatment history, history of drug and professional history. A detailed clinical examination was recorded. Personal data like age, smoking status, income and area of living were recorded by filling the Performa. The time of COPD diagnosis was taken from hospital record. Pulmonary status of patients was objectively assessed by pulmonary function test. Standard spirometry was done of all patients and best of the three values were recorded. By this forced expiratory volume in 1 second (FEV1), forced vital capacity (FVC) and FEV1/FVC were measured. The different stages of COPD were labelled as mild COPD (FEV1 >80%), moderate COPD (FEV1 50-80 %), sever COPD (FEV1 30-50%) and very sever COPD (FEV1 < 30%) according to GOLD criteria.

The patients completed International Index of Erectile Function (IIEF) Questionnaire.

Erectile dysfunction and severity of erectile dysfunction were recorded with IIEF Questionnaire according to National Institute of Health criteria. Patients were asked about erection firmness, erection confidence, maintenance frequency, maintenance ability. Every parameter given five-point scale. Low score represents poor sexual status and high score represent better sexual status. ED was divided into four categories as none (IIEF score 22-25), mild (17-22), moderate (12-16) and sever (5-11). Questions about sexual desire were evaluated separately.

Hormone levels were also checked, which have influence on erectile dysfunction. Blood serum level of testosterone, free testosterone, luteinizing hormone, estradiol, prolactin, thyroid stimulating hormone and follicle stimulating hormone were recorded early in morning between 7 a.m. to 9 a.m.

Data was analyzed by using SPSS vol 23. Numerical variables like age, BMI and duration of COPD were statistically analyzed by using their mean and standard deviation and t-test was used to check their significance. Non numerical variables like area of living, income status, smoking status and different stages of COPD were statistically analyzed by using their frequency and chi square test was applied to check the significance. P value <0.05 was taken as significance.

## Results

Overall, 100% (n=336) male patients were included, in this study. There were 31.5% (n=106) patients lived in urban areas, while 68.5% (n=230) lived in rural areas. 47.9% (n=161) had low income, 34.8% (n=117) had moderate income and 17.3% (n=58) had good income. Smoking status showed that there were 64% (n=215) ex-smokers, 14.9% (n=50) non-smokers and 21.1% (n=71) were smokers. The mean age and BMI of the patients was 60.21±3.98 years and 27.05±2.24 kg/m<sup>2</sup> respectively. There were 12.8% (n=43) patients between 40-55 years, while majority of the patients i.e. 87.2% (n=293) between 56-70 years of age. The distribution of BMI of the patients observed as; 23.2% (n=78) patients between 18-25 kg/m<sup>2</sup> and 76.8% (n=258) patients between 26-32 kg/m<sup>2</sup>. (Table. 1).

The main outcome variable of this study was Erectile Dysfunction (ED). Classification of ED was noted as no, mild, moderate and severe as 32.7% (n=110), 23.5% (n=79), 16.4% (n=55) and 27.4% (n=92) respectively (Table. 4). Classification of chronic obstructive pulmonary disease (COPD) was observed as mild, moderate, severe and very severe as 5.1% (n=17), 45.8% (n=154), 32.1% (n=108) and 17% (n=57) respectively. The mean smoking (pack years) and duration of COPD was 44.95±2.28 years and 61.99±1.93months respectively (Table. 2). ED status in COPD patients were shown in (Table. 3).

No association was found between ED and area (p=0.484), stratified age (p=0.970), stratified BMI (p=0.283), except income (p=0.000) and smoking status (p=0.000). So, income and smoking status were the effect modifiers for ED. There was no statistical significant difference between means of smoking pack years (p=0.319) and duration of COPD (p=0.238). (Table. 1-2).

**Table. 1**  
**Demographic Variables**

Characteristics	Frequency	Percentage (%)	Test of Sig.
<b>Area</b>			
Rural	230	68.5	$\chi^2=2.45$ $p=0.484$
Urban	106	31.5	
<b>Total</b>	<b>336</b>	<b>100.0</b>	
<b>Income</b>			
Low	161	47.9	$\chi^2=39.66$ $p=0.000$
Moderate	117	34.8	
Good	58	17.3	
<b>Total</b>	<b>336</b>	<b>100.0</b>	
<b>Smoking Status</b>			
Smoker	71	21.1	$\chi^2=37.28$ $p=0.000$
Non-Smoker	50	14.9	
Ex-Smoker	215	64.0	
<b>Total</b>	<b>336</b>	<b>100.0</b>	
<b>Stratified Age</b>			
40-55 Years	43	12.8	$\chi^2=0.243$ $p=0.970$
56-70 Years	293	87.2	
<b>Total</b>	<b>336</b>	<b>100.0</b>	
<b>Stratified BMI</b>			
18-25 kg/m <sup>2</sup>	78	23.2	$\chi^2=3.806$ $p=0.283$
26-32 kg/m <sup>2</sup>	258	76.8	
<b>Total</b>	<b>336</b>	<b>100.0</b>	
<b>Descriptive Statistics (Mean±S.D)</b>			
<b>Age</b>	60.21±3.98 years		
<b>BMI</b>	27.05±2.24 kg/m <sup>2</sup>		

**Table. 2**  
**Characteristics of COPD**

Stages	Frequency	Percentage (%)	Test of Sig.
Mild	17	5.1	$\chi^2=31.02$ $p=0.000$
Moderate	154	45.8	
Severe	108	32.1	
Very Severe	57	17.0	
<b>Total</b>	<b>336</b>	<b>100.</b>	
<b>Descriptive Statistics (Mean±S.D)</b>			
Smoking (pack years)	44.95±2.28 years		t=0.998 p=0.319
Duration of COPD	61.99±1.93 months		t=-0.184 p=0.238

COPD: chronic obstructive pulmonary disease.

**Table. 3**  
**ED status in COPD patients**

Classification of COPD	Classification of ED				
	No	Mild	Moderate	Severe	Total
Mild	10	3	2	2	17
Moderate	94	57	1	2	154
Severe	3	16	50	39	108
Very Severe	3	3	2	49	57
<b>Total</b>	<b>110</b>	<b>79</b>	<b>55</b>	<b>92</b>	<b>336</b>

COPD: chronic obstructive pulmonary disease; ED: erectile dysfunction.

**Table. 4**  
**Classification of ED**

Classification	Frequency	Percentage (%)
No	110	32.7
Mild	79	23.5
Moderate	55	16.4
Severe	92	27.4
<b>Total</b>	<b>336</b>	<b>100.0</b>
<b>ED: erectile dysfunction.</b>		

### Discussion

Sexuality has significant effect on quality of life of human beings {11}. It is natural instinct and source of amusement. Sexual dysfunction disturbed human life in many ways. Erectile dysfunction is type of sexual dysfunction. It is common disorder of elderly men over age of 50 years and it is studied that about one third of

male population over the age of 50 is effected by sexual dysfunction {12}. Cause of erectile dysfunction is multi factorial {13}. It is caused by physical, mental and psychological problems.

Many studies have investigated the association of COPD with erectile dysfunction. Patients with COPD are at higher risk of developing erectile dysfunction compared to general population. A cohort study done in Taiwan showed that the cumulative incidence of erectile dysfunction in the COPD cohort was approximately 1.29% higher than that in the non-COPD cohort {18}. Poor control of COPD and more will be the erectile dysfunction. In one study erectile dysfunction was present 83.3% in COPD patients {19}. In our study the overall prevalence of erectile dysfunction was found 67.2% which is very close to other study {20}. So these studies show that erectile dysfunction is a common problem in COPD patients. It affects human life in many ways.

Erectile dysfunction is common comorbidity in many diseases {14}. Patients with diabetes, COPD, cardiovascular diseases, chronic renal failure, malignancy suffer this comorbidity. Smoking and decrease functional capacity are independent factors that affect negatively on human sexual life. Prevalence of sexual dysfunction in these systemic diseases is higher than general population. Diabetic men show threefold probability of having erectile dysfunction than men without diabetes {15}.

In cardiovascular diseases erectile dysfunction is considered another manifestation of same systemic disorder and it often precedes cardio vascular disease onset and might be considered early marker of cardio vascular disease {16}. All elderly patients with vasculogenic erectile dysfunction should be screened for cardio vascular disease {17}. Similarly, patients with chronic renal failure and malignancy show increased probability of developing erectile dysfunction.

Unluckily in clinical practice of respiratory medicine clinicians focus more on bronchospasm, dyspnea, infections and respiratory failure and they fail to ask and investigate erectile dysfunction in COPD patients {21}. A study also show that COPD patients also hesitate to share about sexual dysfunction {12}.

Association of COPD and ED is not a straightforward matter. The presence of co-morbidities and risk factors like smoking, decrease functional capacity and aging make is difficult to distinguish what came first the ED or COPD.

The exact mechanism of erectile dysfunction in COPD is unclear. Hypoxemia is main factor in developing erectile dysfunction {22}. It results in reduce activity of nitric oxide synthase which cause vasoconstriction. Erection is hemodynamic event and it is caused by dilatation of penile arteries and relaxation of smooth muscles in corpus cavernosum. This all is mediated by nitric oxide which in turn is effected by hypoxemia.

COPD is disease of smokers. Smoking is established risk factor and is strongly associated with erectile dysfunction. Increased oxidative stress and endothelial dysfunction are major mechanism that result in erectile dysfunction {23}. The result of one study showed that risk of developing erectile dysfunction in current smokers was increased by 51% and 20% in ex-smokers as compared to nonsmokers {24}.

Our study like other studies showed a significant prevalence erectile dysfunction in COPD patients. So it is very important for physicians to inquire about sexual dysfunction in COPD patients.

Limitation of the study was that sample size used in this research was relatively small and other factors of erectile dysfunction in these patients were not analyzed and compared.

## Conclusion

Results of our study showed that erectile dysfunction is significantly prevalent in COPD patients. Erectile dysfunction is hidden comorbidity in COPD patients. Respiratory physicians should ask and investigate about sexual dysfunction in these patients. Patients should also be encouraged to talk about and share the sexual problem.

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