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PREVALENCE OF ANXIETY AND DEPRESSION IN COPD PATIENTS AND ITS CORRELATION WITH AGE, GENDER, DISEASE SEVERITY AND HEALTH RELATED QUALITY OF LIFE

Physiotherapy

Ancy Vincent* Department of Cardiovascular and Pulmonary Physiotherapy, Terna Physiotherapy College, Nerul, Navi Mumbai. *Corresponding Author

Ashwini Dangi Associate Professor and Head, Department of Cardiovascular and Pulmonary Physiotherapy, Terna Physiotherapy College, Nerul, Navi Mumbai.

Medha Deo Principal, Terna Physiotherapy College, Nerul, Navi Mumbai.

ABSTRACT

Background: The aim of the study was to find the prevalence of anxiety and depression in COPD patients as undiagnosed cases may have an negative impact on the overall health status and find its correlation with factors like age, gender, disease severity and health related Quality of Life (QOL).

Method: 226 subjects enrolled in this study. Basic demographic details were gathered. Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression. QOL was assessed using St. George's Respiratory Questionnaire (SGRQ).

Result: Prevalence of anxiety and depression in COPD subjects in the study was 35.4% and 52.7% as per HADS questionnaire. Age and SGRQ score showed a significant positive correlation whereas disease severity showed a significant negative correlation with anxiety and depression. Association of the anxiety and depression with gender showed anxiety to be statistically significant in males and females.

Conclusion: Higher rates of depression and anxiety symptoms are seen in patients with COPD even in earlier stages of the disease.

KEYWORDS

COPD, Anxiety, Depression

INTRODUCTION:

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) defines chronic obstructive pulmonary disease (COPD) as "a preventable and treatable disease with some significant extra pulmonary effects that may contribute to the severity in individual patients.[1] The World Health Organization report states the prevalence of COPD to range between 4% and 20% in the Indian adults.[2] COPD is not only associated with reducing lung function, an array of extra-pulmonary symptoms are also seen in patients. Nutritional abnormalities, weight loss, and skeletal muscle dysfunction[3]especially of quadriceps muscle is a well-recognized systemic effects of COPD. Two most common co-morbidities seen in patients with COPD are anxiety and depression, which is often left untreated.

Depression and anxiety has an effect on mortality. A meta-analysis done in 2013, demonstrated comorbid depression and anxiety were associated with increased risk of mortality with relative risks of 2.29 and 1.27 respectively.[4] Di Matteo et al found that patients with depression and anxiety symptoms are three times more likely to be non-adherent to their prescribed medications.[5] Signs and symptoms of anxiety and depression may be similar to COPD symptoms and may be missed by the physician. Depression and anxiety maybe often untreated in patients with COPD due to lack of early diagnosis. Untreated or incompletely treated depression and anxiety have major implications for compliance with medical treatment, increased frequency of hospital admissions and prolonged length of hospital stay. It may also have an impact on pulmonary rehabilitations. Little is known about the prevalence of anxiety and depression in COPD patients in Indian population. Also, very less correlational studies have been done to learn about the effect of both anxiety and depression on various factors like age, gender, disease severity and QOL. Due to the burden associated with the presence of anxiety and depression, screening and early treatment of these symptoms is important.

Hence this study was undertaken to assess prevalence of anxiety and depression in patients with COPD and correlate anxiety and depression with factors like age, gender disease severity and health related QOL.

MATERIAL AND METHOD:

The present study included 226 COPD subjects from primary and tertiary health care hospital in Mumbai. Institutional Ethics Committee clearance was obtained. All subjects with a spirometry confirmed diagnosis on the basis of GOLD's guidelines[1] and those who scored a total of minimum 11 on the Hospital Anxiety and Depression Scale (HADS) were included in the study. Subjects diagnosed with anxiety and depression before COPD diagnosis or with a previous psychiatric illness were excluded. Demographic details were gathered by using patient record sheet, which included general characters such as age, gender, occupation, education, duration of COPD, smoking status and income using Kuppuswami scale. Subjects included were evaluated for presence of depression and anxiety using HADS.[6] QOL was assessed using St George's Respiratory Questionnaire (SGRQ).[7]

All the data was analyzed using SPSS 20 for windows. Normal distribution of data was tested for all baseline parameters. Spearman's correlation was used to correlate age, disease severity and QOL with anxiety and depression. Chi-square test was used to associate gender with anxiety and depression. p value of <0.05 was considered statistically significant.

RESULT:

Baseline characteristics of the COPD patients are shown in Table 1. The mean age was 54.10±11.60 for male and 58.10±13.77 for females. Duration of COPD was 9.057±7.32 years for males and 9.90±8.87 years for female. Out of 226 COPD subjects included in the study as per HADS-A questionnaire, anxiety was seen in 80 (35.4%) subjects whereas 57 (25.2%) subjects were in the borderline abnormal category. Similarly, depression as per HADS-D questionnaire was seen in 119 (52.7%) subjects and 45 (19.9%) subjects were in the borderline abnormal category. Table 2 shows characteristics of COPD patients according to the GOLD[1] severity classification. It can be seen that as the disease severity progresses there is a statistically significant increase in all the characteristics and reduction in FEV_1 score ($p < 0.001$). Anxiety and depression score significantly increase with progression in disease severity with a mean anxiety score of 7.62±4.04 for moderate, 16.71±3.58 for severe and 21.0±0.0 for very severe and mean depression score of 9.39±4.93 for moderate, 19.09±1.90 for severe, 19.09±1.90 for very severe disease severity ($p < 0.001$). Table 3 depicts the correlation matrix. Age showed a significant positive correlation with anxiety ($\rho=0.762$, $p<0.001$) and depression ($\rho=0.775$, $p<0.001$). The spearman correlation coefficients (R^2) are 0.573 and 0.627 respectively. Association of the anxiety and depression with gender using Chi- Square showed anxiety to be statistically significant in males and females ($p<0.001$) whereas depression was not statistically significant in males and females ($p<0.747$). Anxiety was seen 46.8% males and 81.5% females compared to depression, which was seen in 71.2% males and 72.8% females respectively. Disease severity (table 3) showed a significant negative correlation with anxiety ($\rho=-0.689$, $p<0.001$) and depression ($\rho=-0.764$, $p<0.001$) with correlation coefficients (R^2) 0.509 and 0.580 respectively for anxiety and depression. SGRQ score (table 3) showed a significant positive correlation with anxiety ($\rho=0.793$, $p<0.001$) and depression ($\rho=0.839$, $p<0.001$) with correlation coefficients (R^2) 0.662 and 0.728 respectively.

Table 1: Variables studied in COPD Subjects:

COPD subjects	All	Males	Females	P-value
	(Mean±SD)	(Mean±SD)	(Mean±SD)	
No. of Subjects	226	140	86	
Age in years	55.62±12.60	54.10±11.60	58.10±13.77	0.020
Duration of COPD (years)	9.38±7.94	9.057±7.32	9.90±8.87	0.442
Anxiety (HADS-A score)	9.06±5.21	7.40±4.42	11.76±5.31	<0.001
Anxiety Prevalence (%)	35.4	22.5	57.1	
Depression (HADS-D score)	10.88±5.85	10.01±5.26	12.31±6.48	0.004
Depression Prevalence (%)	52.7	47.9	60.7	
SGRQ	54.10±19.14	51.87±17.23	57.73±21.52	0.025
FEV_1	60.33±10.85	60.36±9.76	60.28±12.48	0.958

Table 2: Characteristics of COPD subjects according to the GOLD[1] severity classification:

COPD Subjects	Mild	Moderate	Severe	Very Severe	P-value
	FEV^1 ≥ 80%	≥ 50% FEV^1<80%	≥ 30% FEV^1<50%	FEV^1<30%	(Kruskal –Wallis Test)
	(Mean ± SD)	(Mean±SD)	(Mean±SD)	(Mean±SD)	
No. of Subjects	2	188	35	1	
Age (years)	37.50±2.12	52.22±9.93	74.09±6.92	85.0±0.0	<0.001
Duration of COPD (years)	1.00±0.0	7.29±5.74	20.46±8.28	30.0±0.0	<0.001
Anxiety	5.00±2.83	7.62±4.04	16.71±3.58	21.0±0.0	<0.001
Depression	2.50±3.54	9.39±4.93	19.09±1.90	21.0±0.0	<0.001
SGRQ	28.77±8.78	49.03±15.38	81.60±10.60	95.68±0.0	<0.001
FEV1	80.0±0.0	63.26±8.36	44.40±5.63	28.0±0.0	<0.001

Table 3: Correlation Matrix between the variables of COPD Subjects:

Parameter		Age	Duration of COPD	Anxiety	Depression	SGRQ	FEV_1
Age	Pearson Correlation	1.000					
	Sig. (2-tailed)	.					
Duration of COPD	Pearson Correlation	.842**	1.000				
	Sig. (2-tailed)	.000	.				
Anxiety	Pearson Correlation	.812**	.753**	1.000			
	Sig. (2-tailed)	.000	.000	.			
Depression	Pearson Correlation	.824**	.748**	.903**	1.000		
	Sig. (2-tailed)	.000	.000	.000	.		
SGRQ	Pearson Correlation	.840**	.782**	.881**	.917**	1.000	
	Sig. (2-tailed)	.000	.000	.000	.000	.	
FEV1	Pearson Correlation	-769**	-.742**	-.786**	-.830**	-.850**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.

** Correlation is significant at the .01 level (2-tailed).

DISCUSSION:

Our study found a high prevalence of depression compared to anxiety among patients with COPD. Jennifer Cleland et al in 2007 stated that prevalence of depression (approx. 20%) and anxiety (approx. 30%) were higher in patients aged less than 60 years, irrespective of clinical severity of COPD.[8] Scarcity of data was seen for Indian population. Sharma et al in 2013 found anxiety (20.6%) and depression (13.2%) in stable chronic respiratory illnesses subjects in North India.[9] Another study found the prevalence of depression in patients with severe to very severe COPD as high as 68.3%.[10] Our findings also supported a higher prevalence of depression. It has been seen that the level of functional impairment itself is related to a higher rate of depression.[11] Sekiduka et al attributed that varying biological factor like increased levels of 5-hydroxyindoleacetic acid could result in higher prevalence of depression in COPD patients.[12] Other possible factors responsible could be low self-esteem as well as social isolation and dependency due to symptoms of COPD. As the disease condition progresses, patients' condition deteriorates adding onto these comorbidities. Also use oxygen therapy in later stages can create a social stigma. All these factors can contribute to the occurrences of anxiety and depression.

This study correlated anxiety and depression with age. From this study, it can be concluded that as age advances there is increase in anxiety and depression amongst COPD patients. As patient becomes older, subsequent aging of the airways and parenchyma takes place contributing to more airway obstruction and reduction in the FEV_1 value. Further, breathlessness along with inactivity and subsequent deconditioning result in social isolation, fear and depression as age advances. Dependencies on others for their personal care and lose of interest in ADLs, may worsen with aging resulting in increased depressed and anxious feeling. Use of systemic corticosteroids on long-term bases also has been associated with depression in COPD.[13]

Anxiety was more in females compared to males in our study. Shyam Chand et al in 2016 reported 17.64% of females had anxiety disorders compared to 7.01% of males.[14] Another study reported prevalence was 1.5 times more common in women as compared to men in COPD patients.[15] Our result goes in accordance with the above findings. Majority of Indian women are married housewives, who take care of their family and when they become ill, symptoms interfere with their family life contributing to these comorbidities. In our study, there was a slightly higher prevalence of depression in females compared to males. Di Marco et al proved that females are associated with greater psychological distress and worse perceived control of symptoms. They reported susceptibility to depression in females with COPD.[16] Hence, the factors associated with anxiety and depression could also be gender specific rather than disease-related factors.

Our study also correlated anxiety and depression with disease severity. More severe the airway obstruction, lesser is the FEV_1 value and greater are the disease symptoms. Airway obstruction has shown strong association with depressive symptoms similar to previous studies. One study stated the prevalence of anxiety and depression increased with increasing BODE stages and it correlated well with the severity of atypical broncho-alveolar lavage cytology results.[17] These findings go hand in hand with our results as there was statistically significant increase in the prevalence depression and anxiety with decreasing FEV_1 value ($p<0.001$) and increasing severity of COPD.

Higher SGRQ score denotes a poorer QOL. The detrimental impact of COPD on QOL is well documented. Tsiligianni et al conducted a meta-analysis which showed the presence of depression and anxiety had the strongest correlations with self-reported health status in COPD patient.[18] In our study, SGRQ showed a mean value of 95.68±0.0 in subjects with very severe, 81.60±10.60 in severe, 49.03±15.38 in moderate and 28.77±8.78 in mild disease severity respectively. Another study found that patients with a high level of anxiety, depression or both have a worse QOL.[16] Similar results were found in our study as well. A decline in the QOL due to COPD symptoms can lead to further add on depression and anxiety factor. As there is paucity of literature in Indian population exploring the role of pulmonary rehabilitation in COPD patients with anxiety and depression, further studies can be conducted in this area.

CONCLUSION:

Higher rates of depression and anxiety symptoms are seen in COPD patients even in earlier stages of the disease. High prevalence found in this study raises the issue that clinicians should consider screening COPD patients for depression and anxiety. Anxiety and depression are under diagnosed in these patients and consequently undertreated. These symptoms adversely affect QOL and are likely to contribute to the functional limitations. Treating these symptoms is an important dimension that could improve outcomes in this growing group of patients.

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