Evaluation of Psychological Status in Patients with Asthma and COPD

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) and asthma are major public health problems, which seems to have close association with psychiatric disorders. The present study was conducted to compare the psychological status between asthmatic and COPD patients and clarify the relationship with severity of pulmonary obstruction.

This cross-sectional study was planned to compare the psychological status in 67 stable obstructive lung patients (17 asthma, 24 asthmatic bronchitis and 26 COPD) referred to respiratory clinic of Ghaem hospital and 33 healthy controls, in Mashhad city, north east of Iran. Severity of pulmonary obstruction was determined based on GOLD criteria. "Beck Depression Inventory", "Hamilton Anxiety Rating Scale" and "SCL-90-R" questionnaires were used to determine the psychological status.

Prevalence of general psychopathology in asthma, COPD, asthmatic bronchitis and control groups were 64.7%, 42.3%, 33.3% and 36.4% respectively. Psychological status was directly related to severity of pulmonary obstruction (p=0.048), Prevalence of depression in asthmatic, COPD and asthmatic bronchitis groups were 66.7%, 54.2% and 44.4% respectively. Depression score was related to severity of pulmonary obstruction (p=0.000).Prevalence of anxiety in asthma, COPD and asthmatic bronchitis were 46.7%, 45.8% and 40.7% respectively. Anxiety score was related to marital status and satisfaction with income

Asthmatic and COPD patients are at equal risk of developing psychiatric disorders and both require psychological evaluations in respiratory clinics. Therapists must pay more attention to patients with severe pulmonary disease.

Keywords: Anxiety; Asthma; Chronic obstructive pulmonary diseases; Depression; Psychopathology

INTRODUCTION

Chronic obstructive pulmonary diseases (COPD) and asthma are two common features of pulmonary obstructive diseases. The prevalence of asthma has been increased in recent decades as a major cause of disability and death.[1] Chronic obstructive pulmonary disease (COPD) is the fourth cause of death in some parts of the world.[2]

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Fifteen percent of population aged 55 to 64 suffer from at least a moderate obstructive pulmonary disease and this increases to 25% after 75 years of age.[3,4]

It makes sense that asthma and COPD significantly affect mental health because they impact on activities, sleep and social life of patients. On the other hand, psychological factors may be a risk factor for exacerbation of these pulmonary disorders.

These coexisting psychiatric disorders should be diagnosed and treated as soon as possible, to improve patients' outcome, but unfortunately they often remain undiagnosed without psychiatric assessment. For this propose standard psychiatric questionnaires like "Beck Depression Inventory", "Hamilton Anxiety Rating Scale" and "SCL-90-R" could be used.

Beck Depression Inventory (BDI) is an easy to use self-report questionnaire which was developed to measure the 21 behavioral manifestations and severity of depression, and screens patients who may require intervention and monitor changes in treatment studies. BDI has a high internal consistency (Cronbach $\alpha = 0.87$) and acceptable test-retest reliability ($r = 0.74$) in Persian version.[4,5] People with scores between 0-13, 14-19, 20-28 and 29-63 are suggested to have minimal, mild, moderate and severe depression, respectively.[6]

Hamilton Anxiety Rating Scale (HARS) provides an overall measure of global anxiety severity, including psychic and somatic symptoms and monitors treatment outcomes. It includes 14 items. The scores range from 0 to 56. People with scores equal or more than 14 has been suggested to indicate clinically significant anxiety.[7,8] HARS has been validated in Persian language.[9] SCL-90-R is a multi-dimensional test which consists of 90 questions that assesses nine items of psychopathology, including somatization, obsession, interpersonal sensitivity, depression, anxiety, hostility, phobia, paranoid ideations and psychoticism. General psychopathology index (GSI) is the best general index that summarizes the results.[10] More than 1000 studies demonstrated the validity, reliability and power of SCL-90-R,[11,12] but standard psychiatric interview is necessary to prove the diagnosis. Validity and reliability of these questionnaires in Iranian population have been demonstrated.[13-15]

This study was conducted to evaluate the psychological status (especially depression and anxiety) in Iranian asthmatic and COPD patients and clarify if there is a relationship between psychological status and type and severity of pulmonary diseases.

MATERIALS AND METHODS

This cross-sectional study was planned to evaluate the psychological status in stable asthmatic and COPD patients and compare the results with control group. The study was performed in respiratory clinic of Ghaem hospital, Mashhad University of Medical Sciences, Mashhad city (north eastern part of Iran), from March to September 2008. Spring and summer were preferred to reduce the chance of exacerbations in cold seasons. Proposal was approved by ethic committee of university and an informed consent was fulfilled by each participant.

Asthma was diagnosed by dyspnea, documented findings of airflow limitation in spirometry and significant response to bronchodilator (more than 12% increase of FEV1), while COPD was diagnosed based on dyspnea ,cough and documented findings of airflow limitation in spirometry and non-significant response to bronchodilator (less than 12% increase of FEV1). A history of cough for three months in past two years, classic findings of "emphysema" in plain chest X-ray or high resolution CT Scan and history of smoking were used to confirm the diagnosis. If the patient had some criteria of COPD but his/her response to bronchodilator was more than 12%, he/she was diagnosed as asthmatic bronchitis. The patients were classified in mild, moderate and sever groups based on GOLD criteria.[4]

If any other respiratory disorders (like tuberculosis, lung cancer, bronchiectasis and cystic fibrosis), criteria of acute exacerbation, history of psychiatric disorder and patient disagreement with spirometery or psychological test existed, the patient was excluded from the study. Finally 67 pulmonary patients and 33 healthy controls (randomly selected from physical and mental healthy general population) participated and variables including age, gender, marital status, level of education, satisfaction with income, cooperation with treatment and type and severity of pulmonary disease were recorded. Then all participants were assessed by three psychometric tests including SCL-90-R, Beck and Hamilton. Finally, data were analyzed by SPSS software version 13, using descriptive indices and ANOVA tests.

RESULTS

This study was performed with 100 participants, including 59 women and 41 men. They were 67 obstructive lung patients (including 26 COPD, 17 adult onset asthma and 24 asthmatic bronchitis patients), and 33 healthy people as the control group. The average ages in COPD, asthmatic, asthmatic bronchitis and control groups were 57.61 ± 11.80, 44.52 ± 13.95, 47.87 ± 12.55 and 39.42 ± 6.80 years respectively. Demographic characteristics of these four groups have been shown in table 1. Spirometric values showed that the majority of obstructive lung patients had mild and moderate obstruction (Table 1).

SCL-90-R questionnaire showed that mean GSI were 0.96 ± 0.59, 0.74± 0.51, 0.66 ± 0.52 and 0.69 ± 0.46 in asthmatic, COPD, asthmatic bronchitis and control groups averagely. The prevalence of general psychopathology in these groups were 64.7%, 42.3%, 33.3% and 36.4% respectively. Somatization was the most prevalent symptom among SCL-90-R items in obstructive lung patients (Table2).

ANOVA test showed that general psychopathology (average GSI) was not significantly different between asthmatic, COPD, asthmatic bronchitis and control groups (F=1.365, P=0.258). However, general psychopathology was related to severity of pulmonary obstruction (F=3.185, P=0.048). Also, other psychological disorders like obsessive-compulsive (P=0.025), psychoticism (P=0.014), Paranoid indentation (0.034) and BDI scores (P=0.000) were related to severity of pulmonary obstruction (table 3). Tukey test showed that psychological disorders were significantly more distributed in patients with severe pulmonary obstruction (P<0.05), but the difference between patients with moderate and mild obstruction was not significant.

General psychopathology was related to gender (t=2.458, p=0.017) and marital status (F=5.338, p=0.006). Female patients obtained significant higher GSI scores than male patients. However, GSI was not related to age (r=-0.118, p=0.343), level of education (F=0.445, p=772) and satisfaction with income (F=2.201, p=0.098).

Beck depression mean score in asthmatic, COPD and asthmatic bronchitis groups were 18.23 ± 10.38, 17.88 ± 9.87 and 15.66 ± 11.76 and prevalence of depression in these groups were 66.7%, 54.2% and 44.4% respectively. Depression score was related to severity of pulmonary obstruction (p=0.000).

Table 1. Distribution of demographic variables in COPD, asthmatic, asthmatic bronchitis and control groups

Topics		Control		COPD		Asthmatic Bronchitis		Asthma	
		F	%	F	%	F	%	F	%
Gender	Female	18	54.5	14	53.8	14	58.3	13	22%
	Male	15	45.5	12	46.2	10	41.7	4	9.7%
Marital status	Single	8	24.2	0	0	1	4.2	2	11.8
	Married	23	69.7	20	76.9	17	70.8	14	82.4
	Divorced	2	6.1	1	3.8	4	16.7	1	5.9
	Missing	0	0	5	19.2	2	8.3	0	0
Level of education	Illiterate	0	0	6	23.1	6	25.0	4	23.5
	Elementary	6	18.2	8	30.8	8	33.3	4	23.5
	more than elementary	27	81.8	9	34.6	10	41.7	9	52.9
	Missing	0	0	3	11.5	0	0	0	0
Satisfaction with income	Dissatisfied	6	18.2	14	53.8	15	62.5	8	47.1
	Gently satisfied	25	75.8	3	11.5	3	12.5	4	23.5
	Satisfied	2	6.1	4	15.4	4	16.7	5	29.4
	Missing	0	0	5	19.2	2	8.3	0	0
Severity of pulmonary obstruction	Mild	0	0	9	34.6	8	33.3	12	70.6
	Moderate	0	0	10	38.5	8	33.3	3	17.6
	Severe	0	0	7	26.9	8	33.3	2	11.8

Table 2. Mean, standard deviation and prevalence of pathological scores of 9 items of "SCL-90-R questionnaire", "Beck Depression Inventory" and "Hamilton Anxiety Rating Scale" in asthmatic, asthmatic bronchitis, COPD and control groups

Topics	Control			COPD			Asthmatic Bronchitis			Asthma		
	Mean	SD	Prevalence	Mean	SD	Prevalence	Mean	SD	Prevalence	Mean	SD	Prevalence
Somatization	0.73	0.56	27.3	1.17	0.83	57.7	1.06	0.72	50.0	1.37	0.66	64.7
Obses-compuls	0.73	0.62	27.3	0.79	0.66	26.9	0.72	0.70	20.8	0.96	0.66	35.3
Interp- sensitive	0.77	0.61	33.3	0.75	0.77	38.5	0.59	0.56	29.2	1.10	0.77	58.8
Depression	0.69	0.56	33.3	1.17	0.76	50.0	0.88	0.72	33.3	1.32	0.90	52.9
Anxiety	0.65	0.56	39.4	0.74	0.68	46.2	0.75	0.70	37.5	0.98	0.83	47.1
Hostility	0.72	0.59	39.4	0.54	0.69	26.9	0.74	0.75	37.5	1.01	0.82	52.9
Phobia	0.32	0.56	24.2	0.32	0.48	23.1	0.25	0.31	29.2	0.52	0.60	41.2
Paranoid ideations	1.13	0.58	63.6	0.86	0.69	38.5	0.77	0.80	25.0	1.28	0.82	64.7
Psychoticism	0.46	0.44	42.4	0.47	0.44	46.2	0.50	0.54	41.7	0.68	0.66	52.9
GSI	0.69	0.46	36.4	0.74	0.51	42.3	0.66	0.52	33.3	0.96	0.59	64.7
Beck				17.88	9.87	54.2	15.66	11.76	44.4	18.23	10.38	66.7
Hamilton				17.76	9.67	45.8	14.95	10.27	40.7	16.64	11.28	46.7

Hamilton anxiety score in asthmatic, COPD and asthmatic bronchitis groups were 16.64 ± 11.28, 17.76 ± 9.67 and 14.95 ± 10.27 and prevalence of anxiety were 46.7%, 45.8% and 40.7% respectively. Anxiety score was related to marital status (F=3.222, p=0.047) and satisfaction with income (p=0.013).

In this study, majority of obstructive lung patients had mild degrees of depression and anxiety. Psychological status did not differ between asthmatics and COPD patients (p>0.05), but it was related to severity of obstruction and gender (p<0.05). Also,

depression was related to severity of pulmonary obstruction and anxiety was related to marital status and satisfaction with income.

DISCUSSION

It has been reported that psychiatric disorders are more prevalent in obstructive lung patients than general population,[16-18] but since they used different diagnostic instruments, they reported different prevalence rates.

Table 3. Relationship between psychological symptoms and the severity of pulmonary disease

Topics	F	*Sig.
Somatization	1.497	0.231
Obsessive compulsive	3.905	0.025
Interpersonal sensitivity	5.801	0.005
Depression	1.015	0.368
Anxiety	1.315	0.276
Hostility	1.428	0.247
Phobia	1.421	0.249
Paranoid ideations	3.568	0.034
Psychotism	4.537	0.014
GSI	3.185	0.048
BDI	8.593	0.000
HARS	.000	1.000

*The mean difference is significant at the 0.05 level

It has been estimated that about 50% of asthmatic patients suffer from serious psychiatric disorders.[19,20] In our study, prevalence of general psychopathology in asthmatics was 64.7%, which seems more prominent, but it was not significant compared to 36.4% in control group.

There are some controversies about the prevalence of depression and anxiety in asthma. *Wang* showed that 70% of asthmatic patients have some degrees of anxiety and/or depression.[21] Other studies estimated that depression and anxiety are 6 times more prevalent in asthmatics in comparison with general population.[17,22] But a more precise international WHO survey reported that age and sex adjusted odds ratio for depressive and anxiety disorders in asthmatic patients are 1.6 and 1.5 respectively.[16] In a Canadian survey with psychiatric interview, anxiety was more prevalent in asthmatics than depression (12% versus 8%).[17]

Our study showed that the prevalence of depression and anxiety in Iranian asthmatic patients were 66.7% and 46.7% respectively. Thus, depression is more prevalent than anxiety and both are far more prevalent compared to previous studies. However, psychological status of Iranian asthmatics may be even worse, due to of lack of routine psychological consultations in pulmonary clinics.

There are some studies about the psychological status in COPD patients. *Wagena et al* showed that, general psychopathology (assessed by SCL-90-R questionnaire) has been more prevalent than general population and the odds ratio for depression in patients with severe COPD has been 2.5 in comparison with matched control group.[23] In our study, prevalence of general psychopathology in COPD patients was 42.3% which was not significant versus 36.4% in control group. By using Hospital Anxiety and Depression Scale, anxiety was more prevalent than depression in COPD,[24,25] but another study showed that depression was somewhat more prevalent than anxiety.[26] Again, in the present study depression in COPD patients was more prevalent than anxiety (54.2% versus 45.8%).

In 2007, *Carvalho et al*, compared the psychological status between asthmatic and COPD patients and claimed that anxiety was more prevalent in asthmatics.[27] While, our study showed that there is not a significant difference between asthmatic and COPD patients in terms of general psychopathology, depression or anxiety.

In the present study severity of pulmonary obstructive disease, regardless of being asthmatic or COPD, was associated with higher general psychopathology and depression scores. It is consistent with prior studies which have indicated the impact of severity of pulmonary obstruction on psychological status.[24,28-30] It has been illustrated that in addition to pulmonary symptoms, sociodemographic variables modify the patients' quality of life too. Age is one of the most important factors affecting COPD patients' quality of life.[24] Also, asthmatic patients older than 45 years are at a higher risk of developing anxiety and depression.[31] However, in this study there was not any relationship between patients' age and psychological status.

Gender is another potential factor affecting patient's situation, but different studies reported inconsistent results. In *Wilson's* study, asthmatic men and women had similar prevalence of psychological morbidities.[32] *Nowobilski* stated that asthmatic women experience higher degrees of somatic symptoms and anxiety than men.[33] In the present study, female obstructive lung patients had a worse psychological status compared to male patients, too.

Marital, social, economic and employment status, as well as adverse behaviors such as smoking are other factors determining the patients' psychological distress.[24,29,34] In the presents study, general psychopathology and anxiety scores were related to marital status. It illustrates that a good relationship with spouse has a supportive psychological effects on these patients.

CONCLUSION

Both asthmatic and COPD patients are at a great risk of psychiatric disorders and better control of pulmonary disease may result in improvement of psychological situation. So, self administering screening questionnaires, Consultation and medical therapies are necessary for screening of these patients.

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