

# Assessment of the mind in chronic obstructive pulmonary disease: Mind or never mind

Mind is extremely difficult to define and measure. It is a state of consciousness which enables us to experience and react to the external world. Mind and body relationship has been the major topic of interest for persons engaged in healing of human ailments since the ages.

Thousands of years ago, people used to treat their patients with magic, chemicals extracted from herbs, if no help by prayers and begging for a cure from “gods.”

Hippocrates considered “psychological processes to be insignificant reflections of bodily processes which were subject to laws of physical universe.”

Later in the mid-19<sup>th</sup> century, the mind-body relationship was reiterated by Sir Franz Alexander, who paved the way to our current understanding of psychosomatic research. The modern era recognizes subtle interactions between lung and psyche, but clarity is not yet established. We are traditionally taught that any individual patient is suffering from either an organic or a functional problem, and not both.

Psychiatric comorbidity associated with medical illnesses is increasingly being recognized to play an important role in their natural history. Chronic medical disorders can influence our way of thinking, emotion, and behavior.

Respiratory disorders comprise an important group among all general medical patients.

Psychiatric ailments of various nature have been reported to occur with various respiratory disorders.<sup>[1-3]</sup> The present evidence favors the presence of psychiatric comorbidity in almost all major lung disorders [Table 1].<sup>[4]</sup>

Chronic obstructive pulmonary disease (COPD), a chronic illness is also found to be associated with psychiatric

comorbidity.<sup>[5]</sup> The psychiatric comorbidity of COPD may be considered under following five headings:

1. Effects of smoking
2. Psychiatric disorders with COPD
3. Hypoxia-related neuropsychiatric impairments
4. Psycho-social features of rehabilitation
5. Tools for measurement of psychiatric comorbidity.

## SMOKING

The effect of smoking on the development of COPD can never be underemphasized, and smoking cessation is one of gold standard efforts to stop the progression of COPD. However, smoking cessation is easier said than done. This is because the addiction to tobacco is so powerful that even an extraordinary effort will not be enough to overcome it. Different pharmacotherapies and behavioral interventions have been tried with only limited success.<sup>[6]</sup>

## PSYCHIATRIC COMORBIDITY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Anxiety, especially generalized anxiety disorder and panic disorder are common in COPD.<sup>[7]</sup> Anxiety in COPD is associated with reduced physical ability and re-hospitalization.<sup>[8]</sup>

The clinical presentation of anxiety such as tachycardia, sweating, and dyspnea are similar to that of symptoms of COPD, therefore, anxiety may remain undiagnosed.

Up to about 40% of patients with COPD experience panic attacks characterized by bouts of intense anxiety, physiological arousal, temporary cognitive impairment, and a strong desire to flee from the situation.<sup>[9]</sup> Interestingly, they do not differ from patients without panic on measures of physical functioning. The symptoms of panic disorder distract patients from self-management of disease exacerbations.

Up to about 40% of patients with COPD have clinical depression.<sup>[10]</sup> Depression in patients with COPD is marked by pessimism, reduced sleep, decreased appetite, increased lethargy, concentration difficulty, and social withdrawal. It is associated with impairment in doing daily work, poor self-reported health, impaired self-management of COPD exacerbations and poor overall health behavior.<sup>[9,10]</sup>

**Table 1: Psychiatric comorbidity of major respiratory disorders**

Respiratory disorder	Psycho-morbidity
Asthma	MDD, anxiety, substance abuse
COPD	MDD, anxiety, schizophrenia
Respiratory failure	PTSD, MDD
IPF	MDD
Sarcoidosis	MDD

COPD: Chronic obstructive pulmonary disease, MDD: Major depressive disorder, PTSD: Posttraumatic stress disorder, IPF: Idiopathic pulmonary fibrosis

## **HYPOXIA RELATED NEURO-PSYCHIATRIC IMPAIRMENTS**

The cognitive defects in COPD are mainly due to severe hypoxia and the intermittent positive pressure breathing trial show a positive correlation between neuropsychological impairment and hypoxia.<sup>[11]</sup> Learning in patients with COPD is slower but better than patients with Alzheimer's disease. Attention, recall, memory, drawing, speech, reasoning, and speed of thought are the cognitive faculties mainly affected in patients with COPD.

## **PSYCHO-SOCIAL FEATURES OF REHABILITATION**

Exercise rehabilitation studies in COPD show reduced depression and anxiety after rehabilitation and this is an important area of research. Studies also indicate a positive effect of exercise on cognitive tasks.<sup>[12]</sup> Recent studies have shown a beneficial effect of pulmonary rehabilitation on overall improvement of patients with COPD. However, it has not been addressed fully in these studies whether pulmonary rehabilitation is more effective than psychiatric intervention for psychiatric comorbidity associated with COPD. Furthermore, there is a lack of data regarding cultural and ethnic variations in COPD.

Though the exact sequence of events and morphological changes leading to the occurrence of psychiatric manifestations in COPD are not yet clear, a variety of studies has started addressing these issues. In a recent study by Esser *et al.*, patients with COPD showed decreased gray matter in cingulate cortex, hippocampus, and amygdala.<sup>[13]</sup> This reduction in gray matter was negatively correlated with duration of COPD, fear of dyspnea, and fear of physical activity. It was also seen in this study that the relationship between disease duration and reduced gray matter of the anterior cingulate cortex was mediated by fear of physical activity. Therefore, the "fear of physical activity" may be the central mechanism leading to psychiatric comorbidity in COPD and may be amenable to conditioning and rehabilitation.

Cingulate cortex, hippocampus, and amygdala are the area of the brain closely related to emotion and intelligence. Emotional intelligence is a trainable skill that can improve well-being and performance and thus it may play a significant role in the self-management of emotions in patients with COPD.<sup>[14]</sup>

In an interesting study on emotional aspects, Herigstad *et al.* used functional magnetic resonance imaging (MRI), i.e., multiple presentations of stimuli to generate reliable statistical maps of brain activation on MRI in COPD patients.<sup>[15]</sup>

A set of thirty cue based tasks was identified through discussions with specialists involved in treatment

of COPD. These groups identified cues that reflected situations in which patient is most likely to report breathlessness (e.g., "going upstairs"). The reassessment of cues was also done after a 6 weeks course of pulmonary rehabilitation. It was found that a task for measuring recall of dyspnea and dyspnea-related anxiety is sensitive to clinical change in COPD. Further research in this area may help improve our understanding of brain mechanisms leading to chronic dyspnea in COPD and its management subsequently.

## **TOOLS FOR MEASUREMENT OF PSYCHIATRIC COMORBIDITY**

In last few years, a number of assessment tools have been utilized to evaluate psychiatric as well as general care patients.<sup>[16-19]</sup> Beck's depression inventory is a 21-item scale. The score range is 0–63 and 20 indicates moderate depression. It has excellent measurement properties. Center for epidemiological studies depression inventory is a 20-item scale. The score range is 0–60 and 16 indicates depression. It is mainly validated in older adults. Patient health questionnaire depression scale is a 9-item scale and has good reliability and adequate validity for self-reported screening of depressive disorders.

Beck's anxiety inventory is a 21-item measure score. The range is 0–60 and 20 indicates moderate anxiety with excellent internal consistency. State-trait anxiety inventory is a forty-item scale with twenty items each for transient (state) anxiety and long standing (trait) anxiety. Hospital anxiety and depression scale (HAD) is a 14 items (7 on anxiety and 7 on depression) self-administered questionnaire and evaluates both depression and anxiety in physically ill patients and is a particularly useful measure for patients with COPD.

Wechsler adult intelligence Scale III measures fluid intelligence, overall intellectual ability and has index scores of digit symbol and digit span. This scale is also useful to evaluate cognitive deficits associated with COPD.

Recently, more comprehensive tools for measuring almost all mental faculties in a single setting are available. Global Mental Health Assessment Tool-Primary Care version (GMHAT-PC) is a comprehensive assessment tool which has good level of agreement among other scales, for example, HAD.<sup>[20,21]</sup>

In a study conducted by us using GMHAT-PC we found that a significant proportion of patients with asthma, COPD, and some other respiratory disorders had psychiatric comorbidity.<sup>[22]</sup>

In this issue of Lung India, there is a study on psychiatric comorbidity of COPD using mini international

neuropsychiatric interview tool.<sup>[23]</sup> In this study Chaudhary *et al.* found that the psychiatric comorbidities were significantly higher in COPD patients (28.4%) as compared to controls (2.7%) with a  $P < 0.05$ . The psychiatric comorbidities were significantly more prevalent in severe and very severe COPD patients. It was also more in patients with higher duration of symptoms (more than 10 years as compared to those with duration of symptoms  $\leq 5$  years).

Regarding our study on GMHAT-PC, we would like to clarify that all major medical disorders were excluded in the study population. Substance abuse was part of GMHAT-PC but we did not find any of it in our study group other than addiction to alcohol ingestion. The varied reports of psychiatric comorbidity in COPD or any other respiratory disorder is mainly due to the difference in the instrument used for detection and the composition of the underlying study population. In the study by Chaudhary *et al.* presence of higher substance abuse, mainly the cannabis abuse is more likely to be due to locally prevalent behavioral trends.

Chaudhary *et al.* and our study had a population of stable COPD patients. It has been shown that psychiatric comorbidity is more in patients with severe and unstable COPD. In a study by Singh *et al.*, in a group of COPD patients with respiratory failure, depression, anxiety, psychosis, alcohol abuse, and drug abuse were independently associated with higher all cause 30-day readmission rates.<sup>[24]</sup> Therefore, psychiatric comorbidity might have a crucial role to play in determining the overall severity of disease and prognosis of the patients.

## CONCLUSION

Psychiatric comorbidity in COPD is common. Recent studies show increased prevalence of psychiatric disorders in COPD, mainly the depression and anxiety. Additional behavioral or pharmacologic interventions may serve as an important adjunct to pulmonary rehabilitation for improvement in psychiatric comorbidity of COPD. Interventional studies should be planned to assess improvement in psychiatric comorbidity associated with COPD.

One should encourage regular and widespread evaluation of mind in patients with COPD and stressors should be identified as this approach may be potentially beneficial in modifying the natural history of COPD.

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