

## Depression and Anxiety in cases of COPD

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### Abstract

Patients with chronic obstructive pulmonary disease (COPD) have many times under-recognized and untreated depression and anxiety symptoms which lead to harmful effects on physical functioning and social interaction. Depression and anxiety are often difficult to identify in patients of COPD. The causes for these associated diseases in COPD are multifactorial including social, behavioural and biological factors. Less than 35% of COPD patients with these co-morbid diseases are receiving appropriate treatment. The factor for this low treatment rate includes patients perceived barrier e.g. reluctance to receive antidepressant drug therapy, poor treatment compliance and deficiency of standardized diagnostic approach.

There are inconclusive evidence to support the efficacy of anti-depressant drug therapy in patients of COPD with comorbid depression and anxiety. Promising results are being noticed in pulmonary rehabilitation, psychological therapy and the collaborative care model in reducing depression and anxiety symptoms in patients with COPD. But, the main limitations are short term follow up period. More research is required to establish the efficacy of these interventions in randomized control trial with larger samples and longer follow up periods.

**Keywords:** COPD, Depression, Anxiety

### Introduction

Improving the quality of life (QoL) is an important target in the clinical management of a chronic disease such as COPD.<sup>(1)</sup> To maximize quality of life in patients of COPD, psychological factors, particularly anxiety and depression need to be carefully assessed and addressed.<sup>(2)</sup> The past two decades have highlighted that the patients of COPD with two or more co-morbidities are more likely to be hospitalized and may die prematurely as compared with COPD patients without any co-morbidity.<sup>(3)</sup> Among such co-morbidities depression and anxiety contribute to a considerable number, notably by impairing the quality of life, perception of disease and adherence to treatment.<sup>(4)</sup> Depression and anxiety are often difficult to identify as these symptoms many a times overlap with those of COPD.<sup>(5)</sup> Under-recognized and under treated depression and anxiety lead to harmful effect on physical functioning and social interactions in patients of COPD, leading to overburdening on health care utilization.<sup>(6,7)</sup> Diagnosing depression and anxiety and developing appropriate treatment protocols are important in improving the quality of life of COPD patients and reducing their health care utilization. This review establishes the current understanding of the prevalence and the potential mechanism of association between COPD and depression and anxiety, and tries to discuss implication for treatment in patients with COPD with co-morbid depression and anxiety symptoms.

**Our knowledge about depression and anxiety:** World-wide mental health related disorders are one of the leading causes of disability and low quality of life in geriatric age group. Mood disorders *viz.* major

depression, dysthymia (chronic depressive symptoms of mild severity), minor depression and anxiety disorders (generalized anxiety disorder, phobias and panic disorders) are common in patients of COPD.<sup>(8,9)</sup> Schneider *et al* found the incidence of depression to be 16.2 cases/1000 person-years in the COPD group, compared with 9.4 cases/1000 person-years in the non COPD control group. They took a total of 35,000 patients with COPD and with a follow up of 10 years. It has been also observed that patients with severe COPD were twice as likely to develop depression compared to patients with mild COPD.<sup>(8,10)</sup> Eisner *et. al.*<sup>(11)</sup> in their cross-sectional study reported that COPD patients have 85% more chances of developing anxiety disorders compared with healthy matched controls. The prevalence of anxiety in COPD out-patients ranges between 13% to 46%.<sup>(5)</sup> COPD patients with anxiety disorders are twice as likely to exhibit self reported decreased exercise tolerance, poorer functional limitation and increased frequency of exacerbation when compared with those without anxiety symptoms. Depression and anxiety disorders are disabling and if not treated can progress to more chronic form with lower self-esteem of the patients, increased risk of suicidal tendencies, and increase in the chances of hospitalization.<sup>(5,9,10)</sup>

**Possible mechanism involved in the potential association with COPD:** The relationship between depression and anxiety is explained through complex causal mechanism.<sup>(12)</sup> The relationship between COPD and Depression is bidirectional, as was evident from a systematic review and Meta analysis of 25 studies with long term follow-up.<sup>(10)</sup> Depression could be both a cause and a consequence of COPD; however, an exact

cause linking the two has not been identified. Relationship between COPD and depression appears to be largely explained by confounding factors such as previous history of cigarette smoking.<sup>(13)</sup> Smoking increases the risk and severity of COPD, makes life stressful and increases the risk of depression and anxiety in the same patient. The relationship of mood disorders to COPD appears to be largely accounted for by nicotine dependence. Depression and anxiety may lead to fear, hopelessness, low self-esteem and social isolation, this leads to a vicious cycle which aggravates anxiety and depression. Now there are emerging evidences to suggest low grade chronic inflammation to be causal in association between COPD and depression. Increased inflammatory markers have been found in both COPD<sup>(14)</sup> and chronic depression.<sup>(15)</sup> Increased level of inflammatory bio-markers viz. IL6 and C-Reactive protein were found in part to be the associating link between depression and pulmonary obstruction.<sup>(16)</sup>

Another study examining the prevalence of depression in COPD patients, smokers without COPD and non-smokers without COPD.<sup>(17)</sup> The prevalence of depression was found to be 26%, 12%, and 7% in COPD patients, smokers and non-smokers respectively. These studies indicate that disease symptoms and quality of life were more important determinants of depression in COPD than clinical and biological markers.

**Treatment options:** The importance of psychological support as a significant part of successful rehabilitation regimens has increasingly been highlighted.<sup>(18)</sup> The available evidences suggest that treatment of anxiety and depression in patients of COPD using selective serotonin reuptake inhibitors (SSRI) is questionable. This may be partly due to the fact that patients think that the antidepressant drugs are addictive and have potential side effects, and the social stigma associated with depression. Lack of knowledge about the mood disorders, reason for its being and the efficacy of treatment by the health care professionals leads patients to decline the valuable treatment.

The collaborative care model regarding partnership with patients and the family has been shown to be beneficial in the treatment of depression in patients with chronic diseases.<sup>(19)</sup> A Cochrane review that looked into the studies that investigated the pharmacological intervention to treat anxiety in patients of COPD found that the treatment efficacy was inconclusive.<sup>(20)</sup> To help patients with major depression and severe COPD a personalized nine-session intervention for depression and COPD (PID-C) was developed. Patients with COPD and depression are offered PID-C by care managers, who help patients to work on their regimens and take anti-depressants. A randomized control trial showed that PID-C leads to greater reduction in depressive symptoms in dyspnoea related disability, than usual care, over 28 weeks to 6 months after the last

session.<sup>(21)</sup> Adherence to anti-depressant and lesser severity of dyspnoea related disability, predicted subsequent improvement of depression. Exercise and low depression severity predicted improvement in dyspnoea related disability. A recent uncontrolled 3 week outpatient pulmonary rehabilitation program (6 hours/day for 5 days a week) showed significant improvement in depression and anxiety in patients of COPD.<sup>(22)</sup> A systematic review investigated the efficacy of comprehensive pulmonary rehabilitation in patients of COPD, and showed that reduction in the level of anxiety and depressive symptoms in the short term was comparable with usual care.<sup>(23)</sup> Long term benefits and there clinical significance require further investigation.

Even in acute older inpatients with severe COPD and major depression, rehabilitation was followed by improvement of depressive symptoms and disability. Improvement of depressive symptoms was unrelated to the use of anti-depressant drugs but, was related to the behavioural intervention of pulmonary rehabilitation.<sup>(24)</sup> It must be recommended that long term benefits of pulmonary rehabilitation in reducing anxiety and depression is unknown and further workup is required.

Psychological therapy, including cognitive behavioral therapy and counselling may improve depression and anxiety symptoms in patients with COPD.<sup>(3,7)</sup> But, currently there is uncertainty over dosage and duration of therapy. Bucknell *et al*<sup>(25)</sup> reported that a minority of COPD patients who would learn to implement self-management effectively were younger and were more likely to have good social interaction. These patients had a significant reduced risk of readmission.

**Barriers to treatment:** Anxiety and depression are common in patients of COPD even when their disease is mild in terms of FEV1 and respiratory symptoms.<sup>(26)</sup> The available evidences suggest that less than one third of the patients with COPD and depression/ anxiety are receiving appropriate treatment for it. Maurer *et al*<sup>(7)</sup> reported the multistage barrier for detection and treatment of anxiety and depression in patients of COPD. These include (i) patients related barriers eg lack of knowledge and reluctance to disclose symptoms of anxiety or depression, (ii) physician related barriers eg. Short consultation time, lack of standardized diagnostic approaches, and lack of confidence to pursue in-depth psychological assessment, (iii) system level related barriers eg, poor communication between primary care and mental health system. In order to address these barriers an integrated treatment approach is required from health care providers, patients and their care givers.

Current screening tools for anxiety and depression in patients with COPD have primarily been validated for patients with other chronic diseases. The Hospital Anxiety Depression and the Beck Depression and Anxiety Inventory Scales have been recommended as the preferable screening tools for patients with anxiety

and depression in patients of COPD(7). Designing disease –specific anxiety and depression scales for patients with COPD is a future endeavour.

### Future prospects

Because of strong evidence for the lack of efficacy of anti-depressant drug therapy in patients of COPD with co-morbid depression and anxiety, there appears to be a necessity of well controlled clinical trials to explore efficacy of anti-depressant drug therapy in inducing sustained remission. At present, pulmonary rehabilitation programmes do not provide provision for COPD patients with clinically significant anxiety and depression. Intervention that are specifically targeted to the severity of respiratory impairment, sex, culture and duration of illness may have impact in terms of prognosis and are worthy of further investigation.

### Conclusion

Under diagnosed and untreated anxiety and depression in patients of COPD have deleterious consequences on the patients, their care givers and the health care system. There are some promising results regarding pulmonary rehabilitation, smoking cessation and psychological and antidepressant drug therapy in reducing anxiety and depression in patients of COPD. But, these require to be further tested for their efficacy in well-controlled trial with large samples and long follow-up periods.

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