Anxiety and depression in COPD

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Abstract: - COPD is a disease with multiple co morbidities. Two of the most common and least treated co morbidities are anxiety and depression. The prevalence of depression and anxiety associated with COPD vary considerably because the psychological consequences are rarely screened, because the variety of scales and methods used to measure such symptoms and because the different degrees of illness severity across studies.

The Participants in our study were recruited from patients with COPD, older 40 years old, with Forced Expiratory Volume in one second (FEV1) less than 80%, and FEV1/FVC less 70%, without malignancy, hepatic or renal insufficiency, diabetes mellitus, instable angina pectoris, myocardial infarction within the previous year, cardiac arrhythmias, or other significant diseases, hospitalized in Pneumology Clinic Leon Daniello Cluj, between September 2009-march 2010. The patients were interviewed with Beck Depression Inventory and Beck Anxiety Inventory, and Saint George Questioners for quality of life.

We try to evaluate the risk factors for depression and anxiety like age, gender, lack of social support, severity of disease (COPD), main symptoms, long term use of systemic corticosteroids, value of FEV1, educational level, presence of co morbidity, the total score for depression and anxiety (for quantification of symptoms). The psychological manifestations of COPD are treated in only a minority of patients.

Untreated depression and anxiety have major implications for compliance with medical treatment (lower adherence), increased frequency of hospital admission, and are associated with poor quality of life (may also be a significant predictor of mortality following hospitalization)

Patients with COPD should be screened for depression and for anxiety by their respiratory doctor and should be treated by physician with skills and knowledge of mental disorders.

Key-Words: - depression, anxiety, chronic disease, COPD, mental disorders

1 Introduction

Chronic obstructive pulmonary disease is characterized by chronic airflow limitation. It is a chronic, slowly, progressive with major impact on patient’s health related quality of life, associated with significant co morbidities and extra pulmonary manifestations (1).

Despite the prevalence of depression and anxiety and their impact on the morbidity associated with COPD these psychological consequences are rarely addressed, at least in the respiratory medicine community (2). Prevalence estimates vary widely because the variety of measurement tools and the different degrees of illness severity across studies (3)

Prevalence of depression among patients with COPD is greater than in general population (15-50% compared to 5% in general population). (4) Anxiety is defined as an apprehensive anticipation of danger or stressful situations associated with an excessive feeling of dysphoria or somatic symptoms of tension - restlessness, fatigue, irritability, poor concentration, sleep disturbance and physiological changes such as tachycardia, palpitations, sweating and dyspnea (2) Depression and anxiety may have direct impact on health. Negative impacts of depression have
been for chronic diseases such as coronary artery disease, diabetes mellitus and hypertension but poorly studies in COPD (4, 5, 6)

2 Problem Formulation

The aim of our study (cross sectional) was to examine associations of depression and anxiety with demographic health related quality of life and clinical characteristics of COPD patients hospitalized in our Pneumology Clinic Leon Daniello Cluj-Napoca between September 2009 and September 2010.

2.1. Inclusion criteria

Patients with COPD diagnosis, older than 40 years, with post bronchodilatator forced expiratory volume in one second (FEV1) to forced vital capacity (FVC) ration of <70%, and FEV1 <80%, smoker or ex-smoker.

2.2. Exclusion criteria

- patients with malignancy, hepatic insufficiency, diabetes mellitus, angina pectoris severe, cardiac arrhythmias, myocardial infarction within the previous year.
- none of the patients had history of psychiatric diseases.

Consecutive patients from hospital were included provided that they had been admitted with acute exacerbations of COPD. Patients completed a Saint George’s Respiratory Questionnaire, Beck Depression Inventory, STATE TRAIT Anxiety Inventory (STAI TR and STAI ST), SGRQ contains three subscales (symptom, activity and impact) and the total scores vary from 0 to 100. Higher scores indicated worse health stages.

A questionnaire that included information (on age, gender, smoking history, education level, pulmonary respiratory test – FEV1 value and FEV1/FCV, type of living and family situation – alone or with other, other co morbidity, severity of disease) was completed by psychology specialist in concordance with patients answers and medical document. All information was collected by the same person.

The Beck Depression Inventory (BDI) is questionnaire for measure the intensity, severity, and depth of depression. Its long form is composed of 21 questions but we used shorter form is composed of 13 questions. (7, 8)

Beck Depression Inventory

- 0-4 Normal
- 5-7 mild depression
- 8-15 moderate depression
- Over 16 – severe depression

Significant depression was considered ≥16

STAI, or State-Trait Anxiety Inventory, is an instrument that quantifies adult anxiety. It is questionnaire used to simplify the separation between state anxiety and trait anxiety, feelings of anxiety and depression. We used S-Anxiety scale STAI ST and the T-Anxiety scale STAI TR, each having 20 items. These tests are answered on the basis of a 1-4 scale, with the focused areas including: worry, tension, apprehension, and nervousness. (40-60 score moderate anxiety, over 60 severe anxiety)

The Forced Expiratory Volume in 1 second (FEV1), that is, the expired volume over the first second of spirometry was used to defined the severity of disease in according with GOLD (moderate disease when FEV1 range 80-50% and severe disease FEV1 less50%)

We try to evaluate the risk factors for depression and anxiety. Statistical analyses were performed using SPSS 130. Software version variable, with a P= 0, 05, was considered as having statistically significant 95% confidence interval was used to report the result.

3 Problem Solution-Results

The demographic characteristics of the patients are summarized in Table 1 (age, education level, and occupation, type of living, marital status, smoking status, number of packs/years PA, mean score of BECK, STAI ST STAI TR, and SGRQ)
We found a high prevalence of depressive symptoms (36, 79% with moderate and 15, 09% with severe depression) and anxiety symptoms (41, 51% moderate anxiety and 13, 21% severe anxiety) among patients with COPD. Some patients have both symptoms.

<table>
<thead>
<tr>
<th>Characteristic of the patients</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>66,49</td>
<td>40,00</td>
<td>83,00</td>
</tr>
<tr>
<td>Educ.</td>
<td>8,45</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>PA</td>
<td>24,52</td>
<td>0,00</td>
<td>80,00</td>
</tr>
<tr>
<td>BECK</td>
<td>9,36</td>
<td>1,00</td>
<td>31,00</td>
</tr>
<tr>
<td>STAI ST</td>
<td>57,54</td>
<td>23,00</td>
<td>75,00</td>
</tr>
<tr>
<td>STAI TR</td>
<td>53,70</td>
<td>27,00</td>
<td>76,00</td>
</tr>
<tr>
<td>SGRQ I</td>
<td>61,55</td>
<td>16,15</td>
<td>100,00</td>
</tr>
<tr>
<td>SGRQ II</td>
<td>78,43</td>
<td>35,47</td>
<td>100,00</td>
</tr>
<tr>
<td>SGRQ III</td>
<td>50,65</td>
<td>7,26</td>
<td>99,41</td>
</tr>
<tr>
<td>SGRQ TOT</td>
<td>60,90</td>
<td>23,33</td>
<td>97,73</td>
</tr>
</tbody>
</table>

Mean scores for depression severity (BECK score) was 9, 36 and mean score for anxiety severity was 57,54 for STAI ST and 53,70 for STAI TR.

Depression score was strongly correlated with anxiety.

<table>
<thead>
<tr>
<th></th>
<th>BECK</th>
<th>STAI ST</th>
<th>STAI TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI ST</td>
<td>0,62</td>
<td>0,000001</td>
<td></td>
</tr>
<tr>
<td>STAI TR</td>
<td>0,76</td>
<td>0,000001</td>
<td></td>
</tr>
<tr>
<td>STAI TR</td>
<td>0,71</td>
<td>0,000001</td>
<td>Good correlation</td>
</tr>
</tbody>
</table>

We observed bigger score for female

Female gender was 18, 87% for total, and patients from rural area were 64, 15% but without correlation with depressive or anxiety symptoms. For female the mean score BECK was 12,75 (for men 8,56), mean STAI TR score 55,89 (for men 53,19) and mean STAI ST score 63,51 (for male 56,14). We observed bigger score for female
Fig 4. STAI TR in urban/rural area

The mean age was 66.49 years (range 40-83) with no correlation with depressive (p=0.11) but for anxiety symptoms significant (for STAI ST p=0.003 and STAI TR p=0.002) Older patients have smaller score.

Marital status were: 71.70% (N=76) married; 566% (N=6) divorced/separated; 12.26% (N=173) widowed; 9.66% (N=7) never married; and 2.83% (N=3) unknown. live with somebody but not married 0.94% (N=1).

Type of living: with family 82.07% (N=87), alone 21% (N=14) in Sanatorium 4, 72% (n=5). Mean education years were 8, 34 years.

In other study those who lived alone were more depressive and anxious as compared to those who live with somebody (with family or not), but in our study type of living (p=0.69 for depression, p=0.22 for anxiety STAI ST and p=0.74 STAI TR) or marital status (p=0.94 for depression and 0.81 for anxiety STAI ST and p=0.68 for STAI T) had no correlation.

Depression scores were similar in current and ex-smokers (p=0.07). Smoking status did not associated with STAI STATE (p=0.06). Only STAI TR correlated with smoking history (p=0.01), but no correlation with Pack/years (p=0.27).

FEV less 50% was not significantly related to Beck score (p=0.78), STAI State score (p=0.42) and STAI TR (p=0.62).

Higher score in SGRQ reflected worse quality of life. We evaluated total score in SGRQ and the score symptoms (frequency and severity of respiratory symptoms- SGRQ I), activity (SGRQ II) and impact (SGRQ III). The magnitude of depression and anxiety symptoms has been associated with high score of SGRQ (as well the sub scores symptoms, activity and impact) Table 3.

Our patients had co morbidity: 58% hypertension, 27% ischemic heart disease, 23% pulmonary fibrosis, 8% left ventricular dysfunction, 8% atrial fibrillation, 28% chronic renal failure, 18% sequel tuberculosis, 40% chronic pulmonary heart.
4. Discussion

COPD is a disease with multiple co-morbidities. Two of the most (often appear together) co-morbidities of COPD are anxiety and depression. Both, depression and anxiety are significantly associated with decreased functional status and worse health (4, 9, 10). Significant depressive symptoms are reported in 16–74% and are often unrecognized and untreated in primary and specialty care (4). In our study the patients were not investigated by current doctor, and all are unrecognized and untreated for this co-morbidity (depression and anxiety).

In stable COPD the prevalence of clinical depression ranges between 10% and 42% while that of anxiety ranges between 10% and 12%. (3) Suggested depression prevalence increases with increasing severity of disease (from 19, 6% in mild to moderate disease to 25% in severe disease). (3)

Severe COPD have 2.5 fold increased risk for depression compared with age matched controls. (5)
In patients who have recently recovered from an acute exacerbation the prevalence of depression is high (between 19, 4% and 50%) while anxiety ranges (between 9, 3% and 58%) (3).

Hospitalized patients with COPD have a high prevalence of depression and anxiety (5, 10). Anxiety and depression limits the impact of smoking cessation programmes and may influence self management (4).

Smoking status and experience of depressive episode during lifetime in 1849 (men and women) found 23, 7% of current smokers had major depression compared with only 6, 2% in never smoker (11). In our study we can not confirm an association with smoking history or pack/years.

Female sex was associated with an increased risk for respiratory hospitalization and 37% depression (5). In our study female gender were not associated with depressive symptoms (but we had only 18, 87%) and we did not found fewer depressive symptoms in patients with an elevated Body Mass Index (BMI).

The reason why depression and anxiety occurred more often in our study (51, 88% for depression and 54, 72% for anxiety) may be that all the patients who answered were in hospital with exacerbation, and some of them had other co morbidity. Only 15, 09% had sever depression and 13, 21% sever anxiety.

The presence of these co morbidities has a negative impact on the quality of life, associated with greater disability and impaired functional status (2, 6, 9) and increased the risk of exacerbations (12). In this study the SGRQ score correlated with value of FEV1 (p=0, 01), other co-morbidity (p=0, 02) and exacerbation (p=0,001).

A few possible mechanisms might explain the effect of depression on COPD exacerbation.
- Changes in micro immune cell clases
- More sensitivity and report more respiratory symptoms change
- Lower self confidence and a feeling of hopelessness

Few studies describe risk factors for depression.

- Lack of social support (elderly and chronically ill)
- Severe stage of COPD
- Long term use of systemic corticoids
- Continuing smoking
- Female sex, severe dyspnea
- Higher educational level
- Physical disability
- Long term oxygen therapy
- Low body mass index
- FEV < 50%
- Living alone
- Presence of comorbidities (2,3)

Under detected or untreated depression and anxiety have major implications for compliance of treatment and increased frequency of hospital admission and rehospitalisation (3,4,5,10,13).

Lack of treatment is also associated with poor quality of life, profound impact on end life decisions (options for do not resuscitable decisions).

5. Conclusion

The prevalence of mental disorder among patients with COPD ranges from 10% to 15.8% when using standard diagnostic procedures (14-16.) compared with lifetime rates of 3.6% to 5.1% in the general public. The finding of this study is that patients who had hospitalizations for acute exacerbation in COPD are more likely to report symptoms of anxiety and depression, even their diseases is not severe, and their FEV is not very decreased. The quality of life for our COPD patients was very poor.

Patients with COPD should be screened for depression and anxiety. Better detection, psychological presentation, intervention and antidepressants treatment may improve clinical outcomes, quality of life, survival rate, self care management behavior and health resources utilizations.

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