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Diagnostic significance of different questionnaires in assessing the mental state in patients with chronic obstructive pulmonary disease

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Abstract

In recent years, researchers have been focused on study of somatopsychic disorders often found in COPD patients. There are various types of mental disorders in COPD patients. However, psychic changes such as depression and anxiety are often found in COPD patients with comorbid mental disorders. Unfortunately, none of the COPD patient management guidelines currently offer a detailed screening plan to determine presence/absence of concomitant depression and/or anxiety, or any methods for verification of these somatopsychic disorders

Aim: to identify the questionnaire which can best help detect COPD patients with somatopsychic disorders.

Materials and Methods: we have examined 56 COPD patients. Patients examination included general clinical methods, questionnaires for detecting of mental disorders (PHQ-9, HADS, BDI-SF, STAI), psychiatrist examination.

Results: the following types of somatopsychic disorders have been diagnosed for COPD patients examined by a psychiatrist, not only depression and/or anxiety.

ROC-analysis allowed us to determine that the results received with the HADS had the greatest diagnostic value for detection of somatopsychic disorders in COPD patients. This questionnaire has some other advantages over the rest of the scales.

Keywords: COPD, questionnaires, depression, anxiety, mental disorders

1. Introduction

Chronic obstructive pulmonary disease (COPD) is a multisystem condition with multiple comorbidities [1-5]. They affect the severity of COPD aggravating symptoms, increasing the number of exacerbations and hospitalisations, worsening quality of life, and can lead to an increased risk of death [6-11]. In recent years, researchers have been focused on study of somatopsychic disorders often found in COPD patients [12-18].

There are various types of mental disorders in COPD patients who demonstrate the signs of somatopsychic conditions: high levels of neuroticism, high state anxiety and trait anxiety, depression, dysthymia, substance abuse, asthenia, anxiety syndrome, psychoorganic syndrome, hypochondria, and cognitive disorders [19, 20, 21, 22]. However, psychic changes such as depression and anxiety are often found in COPD patients with comorbid mental disorders [6, 9, 12-15, 17, 23, 24].

The data on prevalence of depression in COPD patients vary significantly: between 7% and 80% according to various researchers [25], and prevalence of anxiety disorders can range from 10% to 100% [9].

The majority of studies use the syndrome-based approach, including analysis of patient questionnaires designed to determine presence and/or severity of depression and anxiety. This discrepancy in data collected by various researchers can be often explained by their use of different questionnaire methods. The nosological approach, i.e. verification of somatopsychic disorders by a psychiatrist, is used less often.

Though the methods of COPD diagnosis and treatment are being improved all the time, detection of somatopsychic disorders in COPD patients remains an important issue. Unfortunately, none of the COPD patient management guidelines currently offer a detailed screening plan to determine presence/absence of concomitant depression and/or anxiety, or any methods for verification of these somatopsychic disorders [26, 27, 28]. Potential tools to detect depression and anxiety in patients with this condition have not been studied yet [29].

No particular questionnaire used to detect depression and anxiety has proven to be better than others in terms of accuracy, reliability or detection of depression and anxiety disorders in COPD patients [9].

The mental status examination is the only way to verify diagnosed psychic disorders in COPD patients. However, is impossible in practical medicine to arrange that somatopsychic disorders are detected in COPD patients by a psychiatrist. The questionnaire methods are a simple, quick and cheap way to detect somatopsychic changes, however, the vast majority of such questionnaire are designed to detect depression or anxiety but no other disorders. Yet, it is known that high scores received by using any of the questionnaires generally indicate the presence of a mental disorders [30, 31]. Therefore, the questionnaire methods can be used for screening to identify patients who are more likely to require psychiatric consultation.

In view of the above, the aim of our study was to identify the questionnaire which can best help detect COPD patients with somatopsychic disorders.

Materials and Methods

We have studied 56 COPD patients (46 men (82.1±5.1%); 10 women (17.9±5.1%); mean age — 63.9±1.0 years; forced expiratory volume in one second (FEV₁) — 51.9±2.2% of the predicted value; COPD Assessment Test (CAT) mean score — 15.7±1.0).

Clinical diagnosis of COPD was formulated in accordance with Order No.555 issued by the MOH of Ukraine on 27/06/2013 [6].

All patients have had a stable phase of the disease for at least two previous months and have been treated as required by Order No.555 issued by the MOH of Ukraine on 27/06/2013 [6].

All patients signed an informed consent form prior to their participation in the study.

Patient examination included general clinical methods (such as collection of complaints, disease and life history data), assessment of clinical symptoms, including by using the CAT [6, 10].

The study was conducted in two phases.

During the first phase, patient mental examination was conducted with the Patient Health Questionnaire (PHQ-9) [32, 33], Hospital Anxiety and Depression Scale (HADS) recommended for detection of depression (HADS-depression) and anxiety (HADS-anxiety) in patients with somatic complaints [32, 34], and Beck Depression Inventory-Short Form

(BDI-SF) [35], State-Trait anxiety Inventory to assess STAI-state anxiety and STAI-trait anxiety, respectively [19, 12, 36].

During the second phase, all patients had final mental state examination by a psychiatrist who used clinical anamnestic, psychopathological and psychodiagnostic methods [32].

Statistical analysis of the data collected during the study was performed by using ROC-analysis. ROC-analysis was performed and ROC-curves were constructed in MedCalc software, Version 16.4.3, publicly available on the developer’s official website.

The difference between references was considered significant at p<0.05 (5%).

Results and Discussion

The following types of somatopsychic disorders have been diagnosed for COPD patients examined by a psychiatrist: cognitive impairment was found in 12 (21%) patients; asthenic syndrome in 10 (18%) patients; emotionally labile disorder in 5 (9%) patients; asthenic neurosis and mild somatoform dysfunction of the autonomic nervous system in 3 (5%) patients; each of mixed anxiety-depressive disorder, moderate depression, histrionic personality disorder and anxiety disorder were found in one patient; and 19 (34%) patients had no somatopsychic disorders.

The utility of questionnaires generally used to detect somatopsychic disorders in COPD patients was assessed with standard operating characteristics of diagnostic models: sensitivity, specificity, area under ROC curve (AUC) showing the correctly classified cases to misclassified cases ratio. AUC allows to compare the utility of detection of pathologies by using a range of alternative diagnostic systems, which means it measures how well a particular parameter can distinguish patients of two diagnostic groups (in our study these two groups were presence/absence of mental disorders). A guide for assessing the utility of a method based on its AUC is as follows: 0.9–1.0 = excellent; 0.8–0.9 = good; 0.7–0.8 = fair; 0.6–0.7 = poor; 0.5–0.6 = fail [37, 39].

The highest sensitivity (>75%) was determined for the HADS-depression, HADS-anxiety, and PHQ-9 questionnaires while BDI-SF had the lowest sensitivity. BDI-SF had the best specificity (>80%). HADS-depression (AUC=0.760, p=0.000) and HADS-anxiety had the highest operational characteristics (AUC=0.724, p=0.032). According to a rough guide for classifying AUC, the diagnostic accuracy of these questionnaire methods is fair. STAI-state anxiety and STAI-trait anxiety showed lower and inaccurate levels of the operating characteristics (Fig. 1, 2, 3).

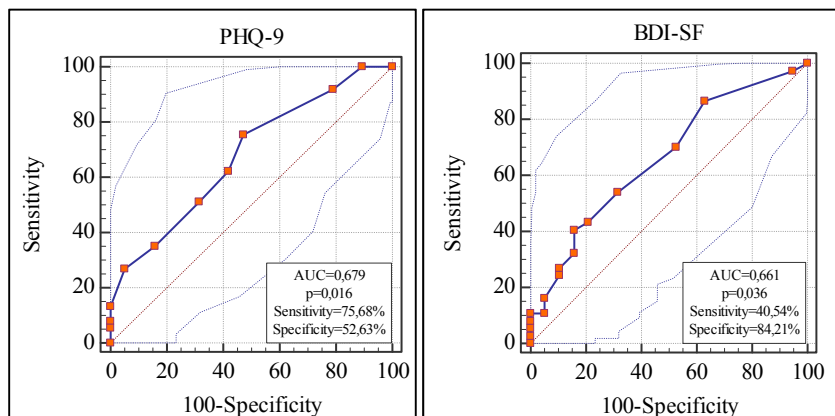


Fig 1: Results of PHQ-9 and BDI-SF ROC-analysis

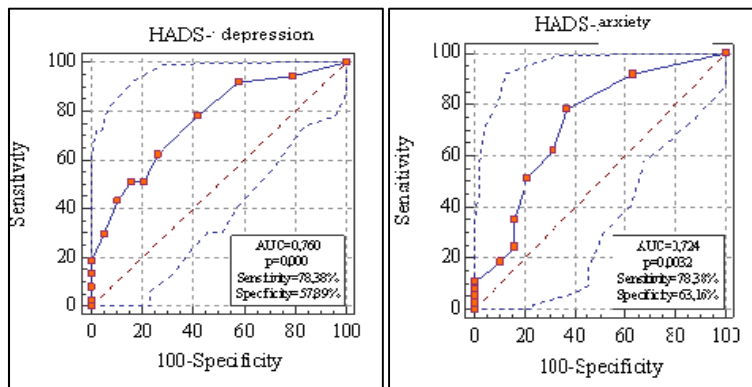


Fig 2: Results of HADS-depression and HADS-anxiety ROC-analysis

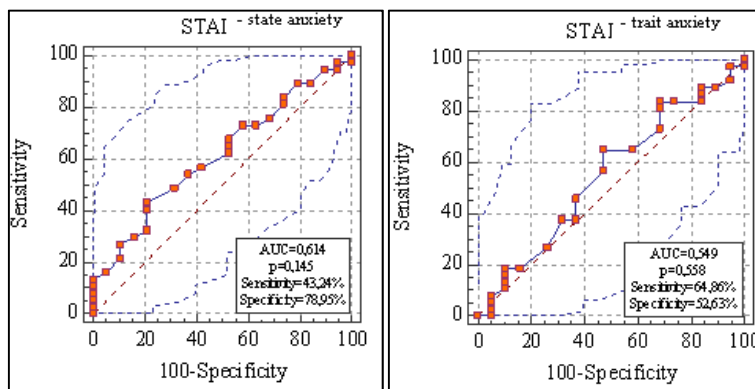


Fig 3: Results of STAI-state anxiety and STAI- trait anxiety ROC-analysis

No significant differences were found between all ROC-curves and the best operating characteristics were confirmed for HADS-depression and HADS-anxiety (Fig. 4).

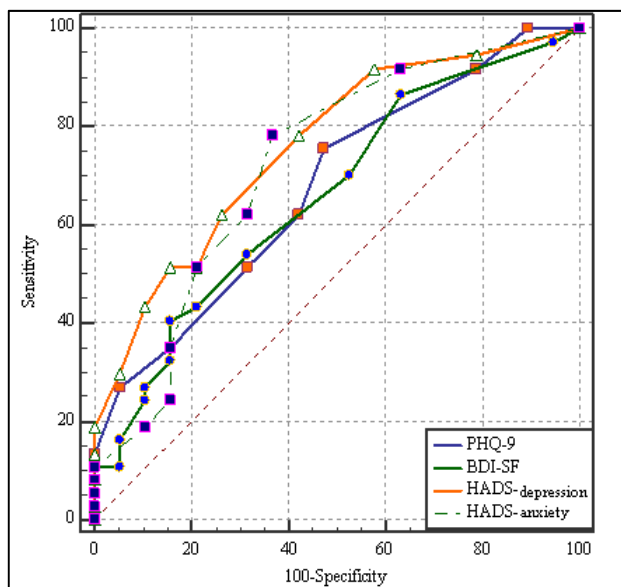


Fig 4: Comparison of psychodiagnostic scales ROC-curves to assess presence of somatopsychic disorders in COPD patients

Thought the questionnaires we used had been designed to identify patients with depression and anxiety, most of those scales helped us establish with certain degree of probability presence or absence of mental disorders without verification of clinical diagnosis which can only be performed by a

psychiatrist. ROC-analysis allowed us to determine that the results received with the HADS (HADS-depression and HADS-anxiety) had the greatest diagnostic value for detection of somatopsychic disorders in COPD patients. This questionnaire has some other advantages over the rest of the scales. Firstly, the HADS was designed to assess changes in the mental state of patients with somatic complaints, including persons suffering from COPD. Accordingly, it takes into account the specific characteristics of patients with somatic disorders: the HADS contains minimum questions about symptoms that can be typical for older patients and be similar to those of somatic conditions, including COPD. Secondly, the HADS helps identify signs of depression and anxiety, which means it has wider diagnostic capabilities. Thirdly, the severity of symptoms is assessed by both their duration and intensity when the HADS is used, which reduces the risk that patient responses are affected by an underlying chronic condition having long-term effects on a person’s mental health. Fourthly, the HADS is easy to use by both patients and healthcare professionals for analysis of the collected data.

Conclusions

1. Somatopsychic disorders found in COPD patients can be of various nature which goes beyond depression and anxiety, and it requires more than using questionnaires to establish each of those disorders.
2. The HADS has certain advantages over the rest of the questionnaires that can be used to detect somatopsychic disorders in COPD patients as was confirmed by using ROC-analysis.

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