VALIDITY OF CAT AND MMRC – DYSPNEA SCORE IN EVALUATION OF COPD SEVERITY

Nena Milačić¹, Bojan Milačić², Olivera Dunjić³, Maja Milojković³

Clinic of Internal Medicine, Department of Pulmonology, Clinical Center of Montenegro, Podgorica, Montenegro¹
Clinical Center of Montenegro, Center for Thoracic Surgery, Podgorica, Montenegro²
University of Niš, Faculty of Medicine, Institute of Pathophysiology, Serbia³

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of morbidity and mortality worldwide. Although predominantly denoted as a pulmonary disease, COPD also presents with various extra-pulmonary effects which influence different aspects of patients’ physical, emotional and mental well-being. Traditionally, evaluation of COPD severity is based on determination of pulmonary function and particularly on forced expiratory volume in 1 second (FEV1). However, numerous evidences show that FEV1 is not a parameter of sufficient strength when compared to the value of clinical symptoms, e.g. shortness of breath, cough, and COPD patients’ quality of life (QoL). Besides, many clinical manifestations of COPD (anxiety, depression and decreased physical ability) are best expressed by patients themselves, and can be better determined by appropriate questionnaires. Some of currently recommended questionnaires used worldwide are CAT (COPD assessment test) and modified Medical Research Council (mMRC) dyspnea score, in combination with FEV1. Global initiative for COPD – GOLD with its current directives from 2013 includes CAT and mMRC parallel with a number of clinical exacerbations and FEV1 as the most valid parameters and based on that, introduces COPD classification into four groups – A,B,C and D, according to the severity of disease. Therefore, we consider that a full insight into the patient’s QoL and treatment efficacy are impossible without introduction of these self-evaluation questionnaires to the classical instrumental respiratory function evaluation in COPD patients. Acta Medica Medianae 2015;54(1): 66-70.

Key words: COPD, CAT score, mMRC-dyspnea scale, GOLD

Introduction

COPD is a complex disease characterized by numerous symptoms, and it is a cause of significant health burden for both patients and healthcare system (1). COPD severity and treatment efficacy are traditionally evaluated by changes in FEV1 (2). Spirometry plays a central role in COPD diagnostics, although it does not accurately reflect the complete picture of health status in COPD patients (3). Namely, COPD patients have numerous symptoms – cough, sputum, dyspnea, chest tightness, and simultaneous existence of systemic inflammation which causes the extrapulmonary symptoms and signs of the disease, impossible to quantify with spirometry. These symptoms are far better explained and interpreted through communication with COPD patients (4-6). Cough, shortness of breath and insomnia are frequently the major causes of impaired quality of life in COPD patients (6,7). A skeletal muscles dysfunction also significantly contributes to the reduction of patient’s physical capacity, with a consecutive altered psychosomatic health status (8). For a detailed insight into the clinical treatment efficacy and disease severity, it would be crucial to accompany CAT and mMRC dyspnea score to the clinical investigation of COPD patients following the spirometry (1,9,10). In this way, it would be possible to track the individual experience without interference of medical professionals, although, at the same time, this would improve the communication between doctor and patient. Key words which describe COPD from patient’s perspective are shortness of breath, fatigue, cough, expectoration (sputum), physical and social functioning, sleep quality and frequency of exacerbations (5,6,11), being the features of COPD which are most frequently reported in questionnaires completed by patients.
(12). CAT questionnaire is very easy to interpret and understand if adequately adapted for patient’s mother tongue, and all together, it consists of all necessary elements to create appropriate scoring system for physical and emotional evaluation of patient’s health status. By all means, it should be emphasized that mMRC scale also enables patients to express their condition in an acceptable manner.

**Modified Medical Counsel Research dyspnea test – mMRC**

Shortness of breath is one of the most frequent symptoms reported by patients with long lasting COPD. The presence of dyspnea significantly reduces the quality of life, leads to inability and causes significant changes in lifestyle of COPD patients (13). It also causes insomnia and sleep disturbances, making patients feel mentally and physically exhausted (14). As a consequence, a major goal of COPD treatment is to diminish this symptom (15). Many tests used include dyspnea, but Medical Research Council dyspnea scale (mMRC), a revised version of Medical Research Council test, is the most frequently used in clinical practice (16). It was introduced more than fifty years ago for patients with chronic bronchitis and it summarizes the score of five offered statements about breath possibility during the daily activities. Patients are offered to choose the one which describes their problems in the best manner. In that way, clinical investigators can get an impression of patients’ perception and severity of disease. This test is very easy to perform; it is valid and correlates with clinical parameters and parameters of respiratory function (17).

**Questionnaire for COPD evaluation – CAT**

COPD Assessment Test-CAT questionnaire (Appendix 1) was developed in 2009, and based on American Food and Drugs Association questionnaire, according to model made on data collected

Appendix 1.: CAT score questionnaire
from more than 1500 patients with COPD. The aim of this was to determine the influence of COPD on health status and quality of life in COPD patients and improve the communication between doctors and COPD patients (18). This questionnaire is a shortened and revised version of the Sent questionnaire, which has been utilized and created for clinical practice for more than 20 years, and proven a very good accuracy (19). Recently, SGRQ has been revised and transformed into its shortened version, yet keeping the validity and accuracy of previous version although with reduced number of questions (20). However, both SGRQ and SGRQ – specific test are very complex, and time-consuming. 

There was a need to develop a new questionnaire which would be short and simple for the clinical usage, and for CAT was proven to possess these qualities. CAT was shown to highly correlate to SGRQ-COPD specific test and moderately negatively correlate to FEV1 value (21,22).

CAT consists of eight items which cover a broad spectrum of COPD symptoms’ influence on patient’s quality of life. In spite of its shortness, it is a reliable determinant of COPD severity and can be routinely applied (22). Each item from the questionnaire is assigned 0-5 points which are given according to the symptom severity, with maximal CAT score of 40 points. These items are cough, sputum, dyspnea, chest tightness, capacity for exercise and activities, confidence, sleep quality and energy levels. CAT can be entirely adjusted to specific native language, easy to understand, short and clear. Its reliability has been already confirmed in several European countries – among others, Belgium, France, Germany, Netherlands, Spain and Great Britain, where investigations have been performed to establish the validity of the questionnaire. These investigations have suggested that CAT score was significantly lower in patients in stable phase of disease (17+8.3), compared to score in patients with exacerbation of COPD (21.3+8.4) (p<0.0001). It was indicated that CAT score correlates with the COPD severity when COPD is staged according to GOLD criteria (I: 16.2+8.8; II: 16.3+7.9; III: 19.3+8.2 and IV: 22.3+8.7; I versus II, p=0.88; II versus III p<0.0001), and that CAT correlated to the SGRQ-C (r=0.8, p<0.0001). It is important to emphasize that CAT was also used for testing the treatment efficacy and was proven as useful, showing that CAT score was decreasing with good therapeutic response and stable phase of disease, if compared to the exacerbation phase, when it had higher values (23).

**Conclusion**

Chronic obstructive pulmonary disease (COPD) is multifactorial disease, characterized by various pulmonary and extrapulmonary manifestations which have significant influence on patients’ quality of life (24). Pulmonary function is an essential component of COPD diagnostics, however not descriptive enough for understanding the patients’ health status and quality of life (1-3). Therefore, new instruments are needed to evaluate these aspects of COPD, and mMRC and CAT score have proven to be very useful (6,7). Importance of COPD influence on physical, emotional and mental health is emphasized by new regulatory guidelines and criteria for clinical use of various questionnaires and interviews (25,26).

Questionnaires as SGRQ-C and CAT indeed offer a comprehensive evaluation of disease influence and have been sufficiently tested in various clinical populations and compared to clinical parameters. They respond to broad spectrum of therapeutical interventions and can give us insight into the treatment clinical efficacy (19,20). Development of CAT score is a result of continuous pursuit for a questionnaire which would be as simple and short as possible and applicable in clinical practice. It has a proven validity and it is a useful indicator of treatment efficacy in COPD patients (18).

Global Initiative of Lung Diseases in its directives recommends application of CAT score and mMRC-dyspnea score for evaluation of COPD patients (1). In concert with respiratory function parameters and number of exacerbations, they make the basis of COPD clinical classification into four groups - A,B,C and D (1). This indicates that traditional COPD severity evaluation based on pulmonary function parameters is not sufficient, and that FEV1 cannot be the only parameter. Patients’ symptoms and history of disease must be also taken into account (5).

Good communication between patients and doctors is an essential constituent of good clinical practice, and this can be achieved also by application of the mentioned questionnaires, CAT and mMRC-dyspnea score. Their best advantages are efficient treatment of COPD, a mutual interest of patients and doctors. Therefore, introduction and application of these questionnaires should become a routine instrument of clinical evaluation of COPD patients in our country. COPD, as a significant economic burden even for highly developed countries, demands the best evaluation practice and efficient treatment, in order to achieve a benefit for patients but also for the health system of our country.
References


VALIDNOST CAT SKORA I MMRC-DISPNEJA SKALE U PROCENI HRONIČNE OPSTRAKTIVNE BOLESTI PLUĆA

Nena Milačić1, Bojan Milačić2, Olivera Dunjić3, Maja Milojković3

Klinički Centar Crne Gore, Interna klinika, Odeljenje pulmologije, Podgorica, Crna Gora1
Klinički Centar Crne Gore, Centar za grudnu hirurgiju, Podgorica, Crna Gora2
Univerzitet u Nišu, Medicinski fakultet, Institut za patofizilogiju, Srbija3

Hronična opstruktivna bolest pluća (HOBP) je jedan od vodećih uzroka morbiditeta i mortaliteta u svetu. Iako je pre svega shvaćena kao respiratorna bolest, HOBP ima i ekstrapulmonalne efekte koji utiču na mnoge aspekte fizičkog, emocionalnog i mentalnog stanja bolesnika. Tradicionalna procena težine HOBP-a oslanja se na merenje plućne funkcije i posebno forsiranog ekspiratornog volumena u prvoj sekundi (FEV1). Međutim, postoje brojni dokazi koji ukazuju da je FEV1 relativno slab pokazatelj u odnosu na simptome koje oseća bolesnik, koji su odraz uticaja HOBP-a na svakodnevni život. Prisutne posledice ove bolesti (anksioznost, depresija, poteškoće u obavljanju svakodnevnih aktivnosti) najbolje mogu registrovati i opisati sami bolesnici kroz odgovarajuće upitnike. Najčešće korišćeni takvi upitnici u svetu su CAT skor i mMRC-dispnea skala, koji u kombinaciji sa vrednostima FEV1 znatno poboljšavaju uvid lekara u težinu HOBP-a, a samim tim i omogućavaju efikasniji tretman bolesnika. Globalna inicijativa za HOBP – GOLD, u svojim smernicama iz 2013. godine, uvrstila je CAT upitnik i mMRC-dispnea skalu, zajedno sa brojem egzacerbacija bolesti i FEV1, u validne parametre klasifikacije bolesnika na grupe A, B, C i D, na osnovu kojih možemo sveobuhvatno sagledati i proceniti HOBP. Acta Medica Medianae 2015; 54(1):66-70.

**Ključne reči**: HOBP, CAT upitnik, mMRC-dispnea skala, GOLD