

PRACA ORYGINALNA
ORIGINAL ARTICLE

PSYCHOEMOTIC FEATURES, STATUS OF COGNITIVE FUNCTIONS AND ASSESSMENT OF BRONCHIAL ASTHMA PATIENTS' QUALITY OF LIFE

Valentyna I. Velichko, Yana I. Bazhora, Galyna O. Danilchuk, Larysa I. Kolotvina

ODESSA NATIONAL MEDICAL UNIVERSITY, ODESSA, UKRAINE

ABSTRACT

Introduction: The worldwide pandemic of bronchial asthma (BA) is creating severe challenges for health care specialists. Asthma patients feature a number of psycho-emotional and cognitive impairments, mark the reduction of quality of life which limits response to therapy.

The aim: to investigate psycho-emotional features, state of cognitive function and assess bronchial asthma patients quality of life.

Materials and methods: 142 patients (61 men and 81 women) with bronchial asthma aged 19 - 57 y.o. were examined. The main group consisted of 78 patients with an uncontrolled course of asthma (UCBA). 64 patients with controlled asthma (CBA) were included in the comparison group. The subjective assessments of quality of life by questionnaire SF-36, assessment of asthma-dependent quality of life (AQLQ) was made. The patients' emotional and psychological profile was assessed using the following tests and scales: MMSE, Montreal Scale for Assessing Cognitive Function, Hospital Alert and Depression (HADS) scale with a qualitative and quantitative assessment of the results.

Results: According to the results obtained, the averaged profiles of the patients' quality of life demonstrated the negative effects of asthma, especially its uncontrolled form. There were statistically significant differences in the quality of life in patients with UCBA according to the five criteria of the MOS SF-36 questionnaire as compared to the CBA group (physical functioning, role-playing, caused by physical condition, general health, social functioning, viability). A comparison of the specific quality of life with the help of the AQLQ questionnaire revealed a significant negative effect of the uncontrolled course of the illness on the patients' quality of life. The correlation analysis of the relationship between the course of asthma and the parameters of a specific life quality showed a close correlation between the level of asthma control and the overall evaluation of specific quality of life ($r = 0,62$; $p < 0.001$). The results of neuropsychological examinations in UCBA patients showed the presence of light predementia cognitive impairments. Manifestations of anxiety-depressive disorders were found in 44 (56.41%) patients in the main group, while in the comparison group, the symptoms of anxiety and depression were observed in 14 (21.88%) cases. Patients with UCBA noted a higher level of anxiety (11.5 ± 1.2 versus 6.9 ± 1.4 , $p < 0.05$), depression (8.3 ± 2.3 versus 5.6 ± 3.9) on the HADS scale compared with patients with CBA.

Conclusion: The psycho-emotional features revealed in UCBA patients can determine the prognosis of the disease and justify the expediency of additional diagnostic and therapeutic psychotherapeutic measures.

KEY WORDS: bronchial asthma, cognitive functions, quality of life, anxiety-depressive disorders

Wiad Lek 2019, 72, 4, 657-663

INTRODUCTION

Travails of patients with chronic somatic diseases are not only corporeal. Any serious and prolonged somatic disease is a significant psycho-traumatic factor that consistently worsens the mental and general health of the patient [1, 2, 3]. At the present time, research the quality of life of patients with various somatic diseases and under the influence of physical, psychological and emotional factors becomes of great importance [4, 5]. The further increase in BA morbidity rate, chronic-recurrent course of pathology and often inadequate effectiveness of medical treatment require new methods for assessing the health status, determining the degree of effectiveness of their treatment.

It is known that almost all diseases develop gradually through the stages of pre-morphological and premorbid conditions and are a manifestation, result of the reduction

of body's adaptive capacity, which H. Selye equated with viability. Under today's conditions, the problem of adaptation to external factors became especially relevant. This is due, in particular, to the poor ecological situation in a number of regions of Ukraine, their radioactive and industrial pollution, and the increase of the negative impact on the person who fell ill of chronic-crisis state of the national economy and politics. The whole complex of these stress factors leads to a further chronization of asthma's course with a tendency to recurrence, to the fall of ability to work, which, in turn, significantly decreases the patients' quality of life (QOL).

Anxiety and mental stress are the result of the prediction of a subjective threat, prediction of a possible traumatic situation and difficulty in creating a «model of the future», which may lead to a lack of one's "route plan" that may depend on individual premorbid personality traits.

Experts of the international research center of quality of life consider the QOL as integral characteristic of the physical, psychological, emotional and social functioning of the patient, based on his subjective perception [4, 5]. In turn, the deterioration of mental health as a result of the combined effects of multi-level psychogenic factors negatively affects the course of somatic illness. This creates a «closed circle» of mutual pathoplastic obstruction, which greatly reduces the sanogenic potential of patients, impairs their QOL, and narrows the prospects of recovery [6].

At the same time, the QOL's features in comorbid pathology have not been studied sufficiently: it is unclear how significant is the contribution of the most crucial, from the clinical and pathogenetic point of view, factors (bronchial obstruction, increase in blood pressure, etc.).

That is why the complex assessment and correction of psychopathological manifestations and psychological peculiarities of patients with disabilities due to chronic somatic diseases is not less important than adequate diagnostics and therapy of the proper main somatic disease [2, 3, 6].

For pulmonary system chronic diseases patients, the most frequent are disturbing (31.6%) manifestations and two types of personality profiles that are indicative of irritability, anxiety, depression, propensity to complain about state of somatic health, fixation on bodily sensations, asthenicity, vegetative lability, predominantly depressed mood, nervousness, fatigue, intrusive fears for their health, lack of initiative, decreased productivity and self-confidence [7, 8, 9, 10].

Thus, the psychological diagnosis of emotional features, identification and qualification of existing psychopathology, psychological diagnosis, assessment of the patients' QOL can change the mode of medical therapy and the choice of the most effective psychotherapeutic intervention, as an ideal approach to the primary provision of medical care by a family doctor in collaboration with a psychotherapist.

THE AIM

Therefore, the objective of the work presented is to diagnose psycho-emotional features, state of cognitive functions and assess the quality of life of patients with bronchial asthma.

MATERIALS AND METHODS

142 patients (61 man and 81 women) with bronchial asthma aged 19 - 57 years old were examined. The average age of the subjects was 40.52 ± 1.09 years. The total duration of the disease was 13.9 ± 1.08 years. The main group consisted of 78 (54.93%) patients with uncontrolled course of asthma (UCBA). 64 patients (45.07%) with controlled asthma (CBA) were included in the comparison group. In both groups, women were marginally dominant (52.56% and 60.60%, respectively).

For the purpose of subjective evaluation of the patients' asthma-dependent QOL, the MOS SF-36 (short form of

health assessment) questionnaire and the Asthma Quality of Life Questionnaire (AQLQ) were used.

The patients' emotional and psychological profile was assessed using the following tests and scales: MMSE Score, Montreal Scale for Assessing Cognitive Function (Mosayev), Hospital Alert and Depression (HADS) with a qualitative and quantitative assessment of the results.

The MOS SF-36 questionnaire consisted of 36 questions in 8 areas: Physical Functioning (PF); Role-based functioning, conditioned by physical condition (RP), - Limitation of the daily activity associated with health problems; general health (GH); pain intensity (BP); social functioning (SF) - limitation in social activity due to physical or emotional problems; emotional functioning (RE) - restriction of the usual activity connected with emotional problems, viability (VT) (level of energy, presence of fatigue); mental health assessment (MH). In addition to these areas, two scales were used: the Physical Health Component (PCS) and the Psychological Health Component (MCS).

The AQLQ questionnaire belongs to the category of special tools for QOL assessing, exclusively for patients with asthma. The questionnaire contains 32 questions, grouped into 4 blocks that affect the most significant for patients with asthma life areas (symptoms, activity limitation, emotional sphere, environmental impact). Depending on how often during the last two weeks the patient experienced some or all of asthmatic symptoms, a score was made on Likert's scale from 1 (all time) to 7 (never). Indicators for each section were obtained by calculating the average. The total QOL was calculated as the average of all sections. The number of points is directly proportional to QOL, that is, the higher the indicator of QOL, the higher it is.

Also, the control of asthma course was assessed by subjective methods: history taking (duration of the disease, causes of exacerbations, frequency of exacerbations, frequency of appeals to the doctor), analysis of complaints (the presence of difficult breathing, breathlessness, wheezing, cough, sputum number, color), analysis of therapies used (dose, multiplicity, duration of administration of each agent), physical examination for the presence of concomitant pathology (cardiovascular system, gastrointestinal tract, genitourinary system, endocrine system), as well as filling the ACT questionnaire (Asthma Control Test), which is a short questionnaire and contains 5 questions with a 5-point evaluation of responses. The sum of 25 marks means complete control of asthma, 20-24 - incomplete control, 19 points or less - indicates lack of control. The ACT assessed the level of asthma control over the last 4 weeks.

Mathematical processing of results is carried out with the help of Statistica StatSoft Inc. computer packages and Excel XP for Windows on a personal computer using parametric and nonparametric computing methods.

RESULTS AND DISCUSSION

The results of our study showed that 72 patients (92.31%) of the main group and 29 (45.31%) of the comparison group have a comorbidity. The most commonly occurring

Table I. Indicators of quality of life in patients with bronchial asthma with different levels of control according to the questionnaire MOSSF-36 (M ± m)

Indicator	Groups	
	Main group (UCBA, n=78)	Comparison group (CBA, n=64)
PF	36.4±2.8*	65.7±3.2
RP	22.8±4.1	47.2±4.3
BP	66.6±5.6	72.9±6.4
GH	31.5±3.3*	56.3±2.9
VT	32.1±3.4*	46.4±2.2
SF	48.3±3.0*	64.7±4.6
RE	37.2±6.2	52.5±8.9
MH	39.1±3.1	46.8±4.2

Note: *- changes significant with the indicators of CBA patients (p<0.05)

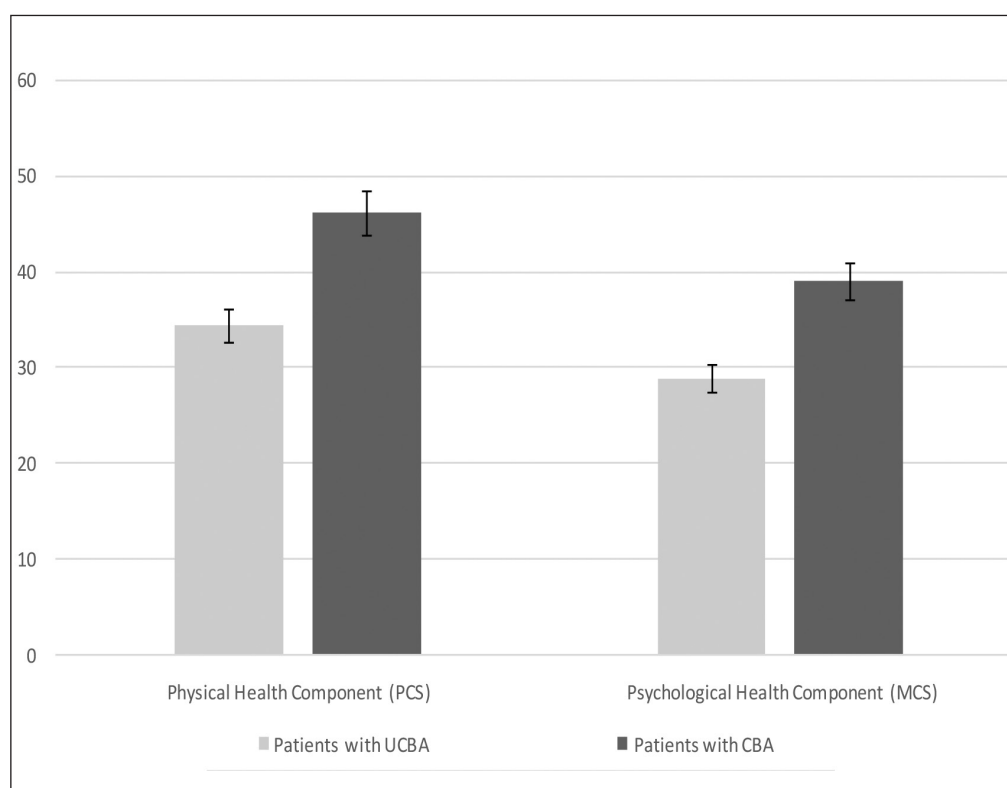


Fig.1. Integral indicators of quality of life

concomitant disease is overweight or obesity.

The main group was diagnosed with obesity in 41.03% of cases (32 patients) versus 10.94% of cases (7 patients) in the comparison group. Excessive body mass was observed approximately equally: in the main group – 41.03% (32 patients), in the comparison group – 42.19% (27 patients). More than three concomitant diseases were observed in 27 (34.61%) patients in the main group and only in 4 (6.25%) in the comparison group.

Hypertension was in the second place among the comorbid pathology, which aggravated the course of asthma. In the main group there were 37 patients (47.43%) and 5 patients in combination with IHD, in the comparison

group – there were 22 patients (34.38%). UCBA patients often suffered GERD - in 42.31% of cases, compared with 29.69% in the comparison group.

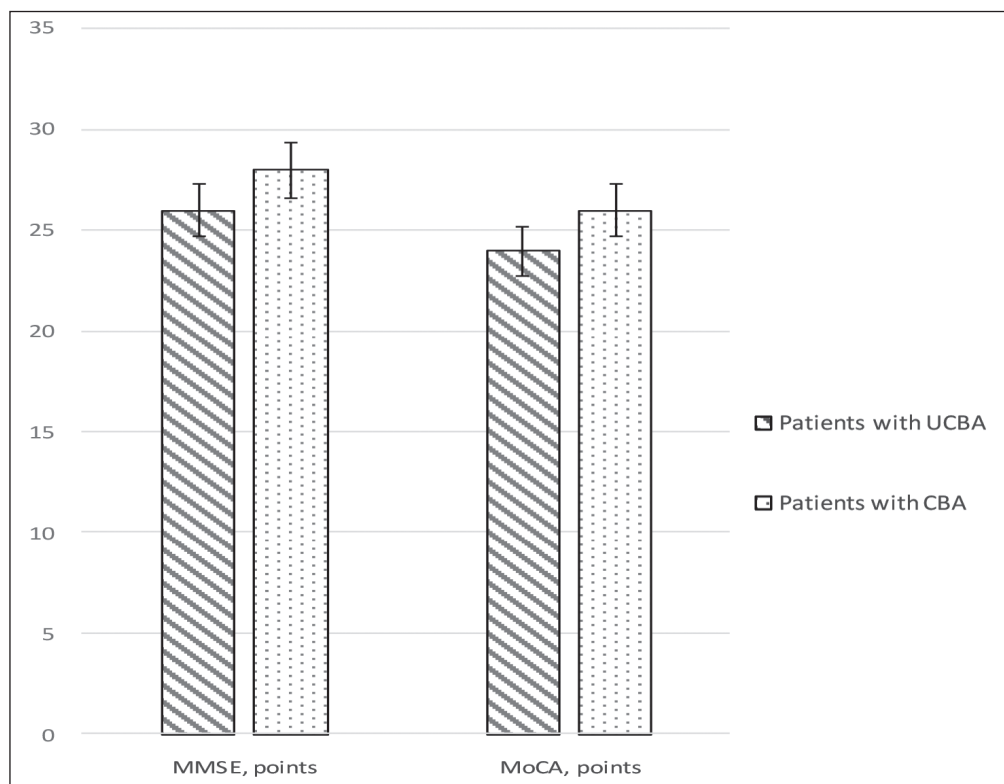
Chronic obstructive lung disease was found in 7 main group patients (8.97%). Almost identically frequent was polyposis rhinosinusitis and allergic rhinitis (almost 28% of cases in both groups). Diabetes mellitus was detected in 2 patients (2.56%) in the main group. Approximately the same frequency was observed in a cohort of patients with severe asthma symptoms suspected of obstructive sleep apnea syndrome, were detected in 31% of cases, while in polysomnography, it was detected in 88-92% of patients.

The socio-epidemiological significance of BA in combi-

Table II. Indicators of specific quality of life in patients with bronchial asthma with different levels of disease control by questionnaire AQLQ ($M \pm m$)

Scale	Group	
	Main group (uncontrolled BA, n=78)	Group of comparison (controlled BA, n=64)
Activity	3.9±0.2*	5.9±0.5
Symptoms	3.4±0.2*	6.1±0.8
Emotions	3.6±0.3*	5.3±0.2
Surrounding	3.3±0.1*	5.4±0.6
General quality of life	3.6±0.2	5.8±0.3

Note: * - changes are probable compared to those in patients with CBA ($p < 0.05$)

**Fig. 2.** Indicators of cognitive function in patients with bronchial asthma with different levels of disease's control

nation with comorbidity is not limited to adverse effects. Equally important is the decrease in QOL, an integral indicator of the degree of adaptation to the disease, the ability to perform the usual functions at work and at home.

The results of asthma patients QOL study with varying degrees of control are presented in Table 1. According to its data, the averaged profiles of the patients under study QOL demonstrated the negative impact of asthma, especially of its uncontrolled form. There are statistically significant differences in the quality of life in patients with UCBA according to the five criteria of the questionnaire MOSSF-36 in comparison with CBA group (physical functioning; role function, caused by physical condition, general health, social functioning, viability). Thus, the index of physical functioning (PF) in patients with CBA amounted to 65.7 ± 3.2 points, whereas in patients with UCBA it was 1.8 times lower - 36.4 ± 2.8 points. The daily

viability (RP) also suffered in both groups of the patients under examination and was reduced to 22.8 ± 4.1 points in the main group and to 47.2 ± 4.3 in the comparison group. The most significant decline in the daily viability was observed in patients with UCBA.

Pain is not a hallmark of asthma, so the frequency of "pain intensity" (BP) was almost the same in the range (66.6 ± 5.6) in patients in the main group and (72.9 ± 6.4) in patients in the group comparison ($p > 0.05$).

The uncontrolled course of BA imposes a significant limitation on the viability (VT) of patients, which is manifested by a substantial decrease in this index in patients in the main group (32.1 ± 3.4 points) compared with the group of CBA patients (46.4 ± 2.2) ($p < 0.05$). Loss of viability should be considered as a risk factor for the development of various depressive states associated with asthma, especially in an uncontrolled course.

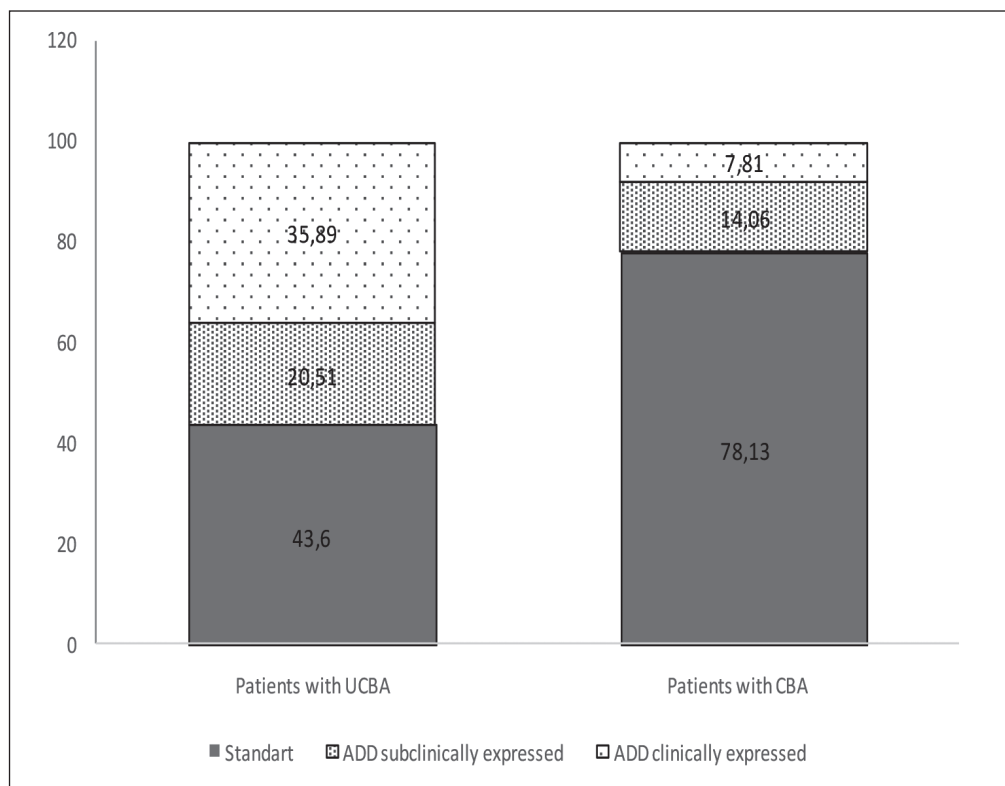


Fig. 3. Anxiety-depressive disorders in patients with bronchial asthma of different levels of disease control according to HADS questionnaire.

In both experimental groups there is a decrease in social activity of patients (SF), which indicates that patients are unable to fully socialize in accordance with age, social status and needs. However, the most pronounced decrease in this indicator was observed in patients with UCBA.

Patients in the main group are also found to be lower than those in the comparison group. Subjective perceptions of BA patients generalized state of health (GH), was lower in main group - 1.5 ± 3.3 and 56.3 ± 2.9 points ($p < 0.05$) respectively. Mental status (MH) was lowered in patients of both groups: in the main group to (39.1 ± 3.1) points, in the comparison group to (46.8 ± 4.2) points ($p > 0,05$). The decrease of this indicator was due to emotional problems, as in the main group and in the comparison group $(37,2 \pm 6,2)$ and $(8,3 \pm 16,7)$ points respectively ($p > 0,05$).

The integral indices of PCS and MCS were statistically significantly different in the groups of patients under study the worst state of the physical and mental health component of the main UCBA group (Fig. 1).

Correlation analysis between the values of the parameters of QOL and the level of control of asthma showed the presence of clinically and statistically significant relationship between them. The most strong connections with the level of control over BA are defined in the parameters of "viability" ($r = 0.63$, $p < 0.0001$) and "physical activity" ($r = 0.61$, $p < 0.001$). Other parameters of QOL have less binding power with the level of asthma control, but also are influential: the role of physical problems in limiting life - ($r = 0.46$, $p < 0.001$); emotional problems in limiting life - ($r = 0.42$, $p < 0.001$), general health - ($r = 0.39$,

$p < 0.0001$), mental health - ($r = 0.36$ $p < 0.0001$) and social activity - ($r = 0.32$, $p < 0.001$).

A comparison of the specific QOL index with the help of the AQLQ questionnaire revealed a significant negative impact of the uncontrolled course of the illness on the QOL of patients (Table 2). Uncontrolled asthma patients activity was touched to a lesser extent, Thus, the indicator of activity limitation in the main group equals (3.9 ± 0.2) points in comparison with the same indicator of patients in the comparison group (5.9 ± 0.5) points ($p < 0.05$). Indicators of symptoms, emotions, environments, and general QOL in UCBA group were significantly lower than in CBA group ($p < 0.05$; $p < 0.05$; $p < 0.05$; $p < 0.05$).

The correlation analysis of the relationship between the course of asthma and the parameters of specific QOL indicates a close correlation between asthma's control level and the overall assessment of specific QOL ($r = 0.62$; $p < 0.001$).

Thus, the dependences obtained have determined the possibility of some QOL parameters searching, that have independent predictive value and are informative factors of the prognosis of asthma control level.

Neuropsychological examinations showed that there were no cognitive impairments in CBA patients: the total score on the MMSE scale was 28 (27-29), on the MoCA scale it equaled 26 (26; 26) (Fig. 2). The results of neuropsychological examinations in UCBA patients showed the presence of slight predementia cognitive impairments. The overall score on the MMSE scale was significantly different from the calculated norm (28-30 points) - 26 (25; 27) points ($p < 0.001$) due to the subtests "attention and

count” and “memory” ($p < 0.05$). The difference between the scores was statistically significant on MoCA scale, too: 24 (24; 25) points ($p < 0.05$) (Figure 2). The formation of moderate cognitive impairments in UCBA patients may be due to frequent hypoxia and with a more common prevalence of comorbidity among these patients.

The psychological testing with the use of the questionnaire “Hospital scale of anxiety and depression” in the general population of asthma examined patients revealed anxiety and depression in 40.84% of cases.

UCBA patients demonstrated a higher level of anxiety (11.5 ± 1.2 versus 6.9 ± 1.4 , $p < 0.05$), depression (8.3 ± 2.3 versus 5.6 ± 3.9) on HADS scale compared with CBA patients.

Manifestations of anxiety-depressive disorders (ADD) were detected in 44 (56.41%) patients of the main group, while in the comparison group, the symptoms of ADD were observed in 14 (21.88%) cases.

At the same time, clinically expressed ADD according to the scale HADS in the main group were observed in 35.89% of patients, subclinically expressed – in 20.51% (mean score 21.7 ± 1.4 and 9.4 ± 1.2 , respectively), whereas in the second group, the symptoms of clinical ADD occurred only in 7.81% of cases, subclinical – in 14.06% of patients (mean score 16.1 ± 1.1 and 8.2 ± 1.3 , respectively) (Fig. 3).

The average inverse correlation between depression severity and the integral index of QOL ($r = -0.67$, $p < 0.001$), as well as between the severity of depression and the patients’ assessment of asthma control in asthma control test have been established, i. e. the more pronounced is depression, the worse is self - esteem of BA control level ($r = -0.49$, $p < 0.001$).

Thus, the identified psycho-emotional features in patients with UCBA can determine the prognosis of the course of the disease and justify the expediency of additional diagnostic and psychotherapeutic measures.

CONCLUSIONS

1. The influence of clinical manifestations on the subjective reflection of health in patients with asthma uncontrolled course was reflected by changes in the physical and mental component by the questionnaire MOS SF-36. It is the reduction of viability, physical and social functioning is to be considered as a risk factor for the development of various depressive states associated with asthma and is an informative factor for predicting the level of disease control ($r = 0.63$, $p < 0.001$, $r = 0.61$, $p < 0.001$; $r = 0.32$, $p < 0.001$).
2. In patients with bronchial asthma, an increase in the severity and frequency of anxiety and depressive disorders was found, depending on the level of disease control. The average force inverse correlation between the degree of depression and the integral index of QOL ($r = -0.67$, $p < 0.001$) is established.
3. The average force inverse correlation between the degree of depression and the patient’s assessment of the level of asthma control was found: the more severe is depression,

the lower is the self-esteem of the control level of the disease ($r = -0.49$, $p < 0.001$), which in its turn reduces asthma’s treatment perception and quality due to the fact that the patient does not adhere to the regime of taking medications, etc.

4. In the program for the management of BA patients it is necessary to include in the diagnostic test the detection of anxiety and depression and to assess the quality of life. In the case of violations detected, the inclusion of psychotherapeutics counselings in order to appoint psychopharmaceutical means is necessary.

REFERENCES

1. Moroz S.M. Psykhopatolohiia i patopsykholohiia invalidnosti vnaslidok somatychnykh zakhvoriuvan (fenomenolohiia, mekhanizmy formuvannia, pryntsyipy psykhosotsialnoi reabilitatsii): avtoref. dys. dok. med.nauk. Kharkiv, 2010; p. 41. [Psychopathology and pathophysiology of disability due to somatic diseases (phenomenology, mechanisms of formation, principles of psychosocial rehabilitation): Synopsis for Doct. thesis (Med.). Kharkiv, 2010; p. 41] (In Ukrainian).
2. Medvedev V.E. Psychosomaticheskie zabelevania koncepciya i sovremennoe sostoyanie problem [Medvedev V.E. Psychosomatic diseases: concept and current state of the problem] Archiv vnutrenney medicini. 2013;6(14):37-40. (In Ukrainian).
3. Kharchenko D.M. Psykhosomatychni rozlady. Teorii, metody diahnostryky, rezultaty doslidzhen: navchalnyi posibnyk [Kharchenko DM Psychosomatic disorders. Theories, methods of diagnostics, research results: textbook] Kyiv. Vydavnychi Dim «Slovo», 2015, p. 280. (In Ukrainian).
4. Surmach M. Yu. Kachestvo zhizni, svyazannoe so zdorovem, kak predmet izucheniya sotsiologii meditsiny [Surmach, M. Yu. Quality of life related to health as a subject of study of the sociology of medicine] Sotsiologiya. 2011;2:100–104 (In Russian).
5. Vorob'ev A. A. Kachestvo zhyttya yak pokaznyka efektyvnosti derzhavnogo upravlinnya [The quality of life as an indicator of the Efficiency of public administration] Mezhdunarodnyy nauchno-issledovatel'skiy zhurnal. 2016;6(48):8-21. URL: <https://research-journal.org/economical/kachestvo-zhizni-kak-pokazatel-effektivnostigosudarstvennogo-upravleniya/> (In Ukrainian).
6. Mihaylov B. V., Vitenko I. S., Serdyuk O. I. ta in, Eksperimental'no-psihologichne doslidzhennya v zagalnyi praktitsi — simeyniy meditsini: navch. posibnik dlya likariv- interniv i likariv — sluhachiv zakladiv (fakultetiv) pislyadiplomnoyi osviti [Experimental-psychological research in general practice - family medicine: teaching. a manual for doctors ininterns and doctors - students of institutions (faculties) of postgraduate education] for community edit B.V. Mikhailova; Kh. KhMAPO, 2011, p. 136 (In Ukrainian).
7. Karavaeva T.A., Vasylyeva A.V., Myzynova E.B., i dr. Alhorytmy diahnostryky trevoznykh rozladiv nevrotichnoho rivnya: metodychni rekomendatsiyi [Algorithms for the diagnosis of anxiety disorders of the neurotic level: methodical recommendations] NMYTS PN ym. V.M. Bekhtereva; SPb, 2018, p. 40 (In Russian).
8. Antonovich Zh. V., Evchenko A.Yu., Tsyirulik A.A. Osnovnyie aspektyi kachestva zhizni patsientov s bronhialnoy astmoy i hronicheskoy obstruktivnoy boleznju legkih [The main aspects of quality of life with bronchial asthma and chronic obstructive pulmonary disease]. Meditsinskiy zhurnal. 2013;3:44–48. (In Russian).
9. Medvedev V.E. Diagnostika i lechenie trevoznykh rasstroystv [Diagnosis and treatment of anxiety disorders]. Voprosy vrachebnoy praktiki; 2011;2:52–55. (In Russian).

10. Brodskaya O.N. Komorbidnie zabolevaniya pri bronchialnoi astme [Comorbid diseases in bronchial asthma] Prakticheskaya pulmonologia; 2017;2:3-13. (In Russian).

Authors' contributions:

According to the order of the Authorship.

Conflict of interest:

The Authors declare no conflict of interest.

CORRESPONDING AUTHOR

Yana I. Bazhora

Odessa National Medical University

Uspenskaya street, 123, flat 3, 65007 Odessa, Ukraine

tel: +380674891155

e-mail: Yana19_91@ukr.net

Received: 07.02.2019

Accepted: 03.04.2019