Psychological Features of the Emotional State of Old-Age Patients with Ischemic Heart Disease at the Ambulatory Stage

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Abstract.

After 60 years' age, men and women have an equalization of the risk of developing ischemic artery disease. At the same time, psychosocial factors in the development of ischemic heart disease differ between men and women. Many authors show that there is a direct influence of a person's emotional state on the electromagnetic signal produced by the heart. This discovery helps to understand better the mechanisms of the pathogenic influence of negative feelings on the functional state of the heart. The purpose of the work is to determine the main negative changes in the indicators of the psychological states of the elderly, ischemic heart disease at the ambulatory stage. And also to determine the presence of gender characteristics, to improve the quality of further psychocorrection. A psychological examination was carried out on 135 elderly respondents. Their psychoemotional states were tested (alexithymia, anxiety, asthenia, neuropsychic stress, various types of aggressiveness, negativism, irritation, suspicion, resentment, guilt, neuroticism, depression, irritability, sociability, poise, shyness, openness, extraversion-introversion, emotional lability, masculinism-feminism). A set of classes was conducted with the old-age people, the main goal of which was to rethink the attitude to their life strategies, identification and understanding of their own emotional states. The retesting results showed a positive impact of the conducted sessions on the psychoemotional state of patients, as well as the fact that between different groups there is a number of significant differences associated both with the health status of the respondents and their gender. Timely and qualitative assessment of the emotional state of patients by clinical and psychological methods can be successfully used for the prevention of disorders or if they are detected for psychocorrection.

Keywords: psychological assistance, ischemic heart disease, ischemia, coronary heart disease, psycho-emotional states

1. Introduction

Despite the epidemiological background of the global space associated with the COVID-19 pandemic, one of the most common threats to human health in the 21st century remains issues of prevention and treatment of various pathologies that are associated with the cardiac activity of the human body, including among them and ischemic heart disease/coronary heart disease (IHD/CHD).

Ischemic heart disease is a serious public health problem due to its high prevalence and mortality (Buttar, H. S. et al., 2005).

Note that the dependence of a person's physical health on his psyche was studied by many scientists, including K. Anokhin, B. Bekhterev, L. Vygotsky, S. Rubinstein, I. Pavlov, I. Sechenov. An important aspect of their work was the consideration of somatic illness in the context of a process caused by psychological factors, as well as the study of the influence of the patient himself on his own physical condition.

The understanding of the disease-causing processes caused by the psychoemotional state of a person helps to understand better the mechanisms of the pathogenic influence of negative feelings on the functional state of the heart, to determine the main negative changes in the indicators of psychological states of the old age people. As it is noted by B. Oniskovets, the characteristics of the influence of emotionally stressful experiences and the formation of cardiovascular diseases are found in the studies of M. Vatsek, E. Gavrilova, Yu. Zimina, O. Chomskaya, M. Shantruchek, and others (Oniskovets, 2020).

A group of authors including employees of Laboratory of Genetics, Department of Biotechnology, School of Food, Biotechnology and Development, Agricultural University of Athens, Athens, Greece, employees of Division of Endocrinology and Metabolism, Center of Clinical, Experimental Surgery and Translational Research, Biomedical Research Foundation of the Academy of Athens, Athens, Greece and other organizations are sure that strong emotions, especially negative emotions, such as hostility, anger, depression and anxiety, precipitate coronary heart disease. On the one hand, coronary heart disease patients have difficulty in coping with stress and depression and experience negative emotions, like anger or frustration. On the other hand, positive emotions, especially hope, contribute to health benefits and lead to lower levels of coronary heart disease and other diseases) (Barna & Grebenik, 2002).

The analysis of scientific studies of the causes of coronary heart disease, conducted by V. Netyazhenko and O. Barna, showed that women under the age of 60 years have a significantly lower risk of developing coronary heart disease than men of the same age group, and myocardial infarction occurs on average by 10 years later. After the age of 60 years, men and women have an equalization of the risk of developing coronary artery disease. At the same time, psychosocial factors in the development of ischemic heart disease differ between men and women (Chrisanthy et al., 2018).

A number of clinical and experimental studies show that there is a direct influence of a person's emotional state on the electromagnetic signal produced by the heart. Thus, when conducting psychophysiological studies of the heart, employees of the Institute of Mathematics of the Heart (USA) have found that depending on what emotions a person experiences, the degree of coherence of the electromagnetic signal produced by the heart changes. In a negative emotional state (for example, irritation or anger), the electromagnetic field of the heart has a non-uniform spectrum of different frequencies, which compete with each other and, when registered, create a pattern that looks uneven and irregular. When people experience positive emotions, such as love, care or sincere gratitude, the electromagnetic signal of the heart has a

homogeneous spectrum, where instead of competing frequencies, there are ordered and synchronous frequencies that are in harmony (Gerber, 2001).

There are several differences between women and men in the presentation, pathophysiology, and clinical course of ischemic heart disease. For women, Ischemic heart disease becomes clinically manifest later in life than men, and is associated with less narrowing of the coronary arteries related to atherosclerotic plaque. Despite this apparent protection from atherosclerotic plaque, women have a similar or worse morbidity and mortality for ischemic heart disease than men (Vaccarino et al., 2013). This may be related to gender differences in pathophysiology.

According to the suggestion of V. Vaccarino, и J. Douglas Bremner stress plays a fundamental role in conferring vulnerability to IHD in women and placing women on a trajectory for increased risk for IHD that may not manifest until later in life. To date, considerable research has focused on IHD in women at the age around or after menopause. However, we advocate a paradigm shift toward the idea that pathophysiological processes, such as those secondary to stressful exposures, beginning before menopause lead to IHD later in life in many women. Processes that begin in the premenopausal years, a time when women are typically considered “low risk”, may be key elements, albeit neglected, of a cumulative increase in IHD risk as women age (Vaccarino & Bremner., 2016).

The above-mentioned group of researchers, referring to a number of works of medical practitioners, scientists, researchers (Musselman et al., 1998; Reichenberg et al., 2001; Panagiotakos et al., 2002; Rugulies, 2002; Van der Kooy et al., 2007; Goldston et al., 2008; Rozanski et al., 2017), argues that in addition to anxiety disorders, numerous studies confirm the well-known symptoms of depression and major depression in patients with coronary heart disease. There was a strong hypothesis for a dose-response relationship between depression and coronary artery disease. Depression meeting diagnostic criteria was associated with a higher risk of coronary heart disease compared with depressive symptoms. For both sexes, somatic symptoms of depression, such as fatigue, may be related more closely to the clinical manifestations of coronary heart disease. These somatic symptoms can be a marker for early coronary artery disease, poor general health, and / or painful behavior associated with systemic inflammatory process.

Thus, it can be argued that a timely and high-quality assessment of the emotional state of patients by clinical and psychological methods plays an important role, which is important for the prevention of disorders or, if they are detected, for psychocorrection (Lytvynchuk, 2014).

2. Purpose

The purpose of our research is to determine the main negative changes in the indicators of psychological states of old-age patients with coronary heart disease at the stage of outpatient treatment. To determine the differences in the psychoemotional states of patients, depending on their gender, in order to improve the quality of further psychotherapy. And also to help patients in understanding and if it is possible in the normalization of their psycho-emotional state.

3. Methodology/Approach

The methodology for studying the psychological characteristics of the emotional state of elderly patients with ischemic heart disease at the outpatient stage is based on a practice-oriented research approach and obtaining real results through experimental measurements and calculations. Thus, a psychological examination was carried out on 135 elderly respondents.

Of these, 41 people were conditionally "healthy" (average age 69.73 years old), That is, a medical examination did not show the presence of pathologies, including IHD. Accordingly, 94 people were diagnosed with coronary artery disease, of which 52 women (55.32%) and 42 men (44.68%) aged from 65 to 75 years. The average age of the patients was 68.87 years old.

To ensure the completeness of the coverage of the clinical picture of the psychological states of patients with coronary artery disease, psychoemotional states were considered and the methods presented in Tab.1 were used.

Table 1: Scientific and methodological tools for determining psychological states

№	Psychoemotional States	Methodology
1	Alexithymia	Toronto Alexithymia Scale, TAS
2-3	Depression anxiety	Hamilton psychiatric rating scale: HAM-D, HAM-A
4	Asthenia	Scale of asthenic state by L. D. Malkova as adapted by T. G. Chertova based on MMPI
5	Neuropsychiatric stress	Questionnaire for neuropsychic stress by T.A. Nemchina
6-13	Physical aggression; verbal aggression; indirect aggression; negativism; irritation; suspicion; image ;feelings of guilt	Bass-Darki state of aggression questionnaire
14-25	Neuroticism; spontaneous aggressiveness; depression; irritability sociability poise; reactive aggressiveness; shyness; openness; extraversion-introversion emotional lability; masculinism-feminism	Questionnaire FRI-B

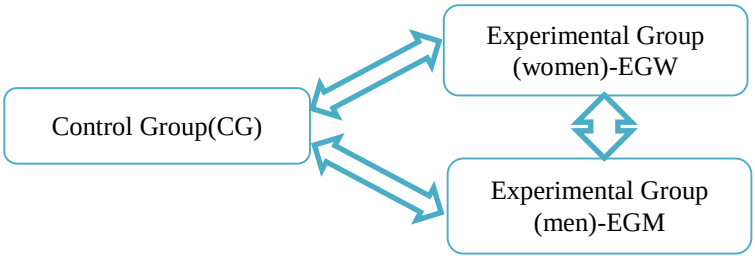
Source: formed by the authors

Collecting data from the participants of the study proved to be quite challenging. Some elderly patients refused to take part in the study, which required an individual approach to many of them. It was explained to old-age people that in addition to being able to improve their own condition, their participation can serve to improve the quality of care for others.

Another problem was that many people had their own subjective opinion about their health, psychoemotional state and the need for its correction, which significantly complicated the possibility of an objective assessment.

The third complicating factor was that elderly patients missed or even denied symptoms of anxiety and depression, but such symptoms could be identified verbally and at the level of empathy: patients lowered their voices, dismal mood manifested itself, and reluctance to make contact in some issues. The obtained results were combined in accordance with certain groups and compared with each other in pairs (Fig. 1)

Figure 1: Interaction between groups of elderly patients



Source: Source: (created by the authors)

Since the number of respondents in each of the groups did not exceed 60 people, the Mann-Whitney U_{emp} statistical test was used to determine that a certain psychological state of the experimental group of elderly women differs from a similar position in other groups (definitions, the existing differences are significant).

$$U_{emp} = (n_1 \cdot n_2) + \frac{n_k \cdot (n_k+1)}{2} + P_k \quad (1)$$

where n_k is the number of respondents in the k-th group; $k = (\overline{1,3})$;

P_k – large rank sum, n_k – the number of respondents in the group with a larger rank sum.

The results of the analysis showed that between different groups there are several significant differences related to both the health status of the respondents and their gender. Negative changes in the psychological states of elderly patients with coronary heart disease at the stage of outpatient treatment were found according to the following indicators:

- alexithymia – significantly higher than similar indicators of healthy people and of men;
- depression – significantly higher than similar indicators for the control group of conventionally healthy elderly people, but lower than of men - patients of the experimental group;
- anxiety – this component is significantly higher than that of elderly men from the experimental group;
- neuroticity – significantly higher than of healthy people and then of men;
- reduced sociability (lower than of healthy and lower than of men);
- low openness (both in comparison with men and with the control group);
- high emotional lability (in comparison with both EGM and CG).

Using all the above-mentioned methods, a set of classes was held with the elderly, the main goal of which was to rethink the attitude to their life strategies, identification and understanding of their own emotional states. All participants were provided with anonymity and comfortable conditions for conducting the survey.

The proposed set of measures was based on a three-tier basis, consisting of the following components:

1) methodological (the main goal, logic and goals of the set of measures): the main goal was to rethink patients' attitudes towards their life strategies, identification and understanding of their own emotional states through the use of socio-psychological training technologies and psychoprophylaxis strategies. The goals were determined to attract effectively the psychocorrection program developed by us, the formation of preventive compliance during the events, the prolongation of the positive effect;
2) methodical (forms and means): group and individual methods of work, the method of "cases", role-playing games, elements of psychocorrection;
3) systemic – the relationship between components and the elements that make them up.

The complex of psychoprophylaxis measures consisted of 3 blocks, had different goals and content:

- diagnostic (pedagogical, androgogical, gerontological) block (4 hours);
- correction of the psychoemotional personality characteristics (18 hours);
- improvement physical condition, increasing endurance and working capacity (6 hours).

1) Diagnostic block (pedagogical, androgogical, gerontological, psychological).
- mini-lecture in the mode of an open group discussion involving medical personnel; psychological counseling of patients concerning their requests, about the peculiarities of emotional states;
- discussion of problematic requests and, in general, trends in the treatment of older people with coronary artery disease. This includes the formation and consolidation of motivation to participate in events, the actualization of group dynamic processes and the creation of a group psychological space (mini-lecture, group discussion / discussion);

2) The block "Correction of the psychoemotional characteristics of a personality" consisted of a theoretical part (several mini-lectures 5-7 minutes long), which revealed the topic of the block, and practical exercises of the block (role-playing and business games, group discussion, group and individual consultation), which were aimed at preventing the identified negative emotional states by using group forms of psychological interventions. At the end of each lesson, a “feedback circle” or “sharing” was also conducted – the group expressed empathy for the participant (protagonist) in deep identifications which in particular gave him the opportunity to receive feedback and smoothly “return to reality” after exciting experiences. Supervision involved group work with a specific critical experience of one of the participants;

3) The block "Improving physical condition, increasing endurance and working capacity" contained such forms of group work as daily training in accessible forms, namely: exercise therapy, dosed walking, breathing exercises.

Upon completion, a second survey took place.

The retesting results showed that as a result of targeted exposure, there were certain changes in the values of indicators of the psychological characteristics of elderly patients with coronary artery disease, as well as the fact that between different groups there are several significant differences associated with both the health status of the respondents and their gender. Statistical evaluation was carried out to determine the real changes. Since the most sensitive (powerful) analogue of the Student's t-test for dependent samples of small size is the nonparametric Wilcoxon signed-rank test, this test was applied.

To determine the degree of connection between indicators at the stages of the first and repeated testing, Spearman's rank correlation was used.

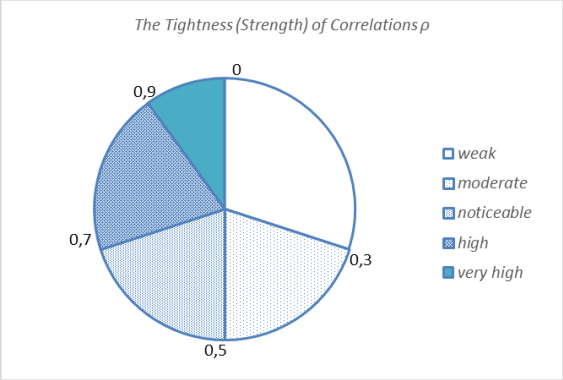
The correlation coefficient is calculated:

$$\rho = 1 - \frac{6\sum d_i^2}{n(n^2-1)}, \quad (2)$$

Where $d_i = x_i - y_i$ is the difference between the ranks of each observation.

To assess the tightness of communication, the Chaddock’s scale was used (Fig. 2).

Figure 2: Chaddock's Measurement



Source: (Mukaka, 2012): updated by the authors

4. Results

The results of a pairwise comparison of the obtained indicators of the psychoemotional state before and after the complex of psycho-prevention measures for significant changes are reflected in Tab.2.

Table 2: An integrative table of experimental results on improvement the psychoemotional state in elderly patients with coronary heart disease

№	Psycho-emotional Component	Dependence			ρ	Influence of Methodology
		before	**after**	**Δ**		
1.	Alexithymia	80,09	80,35	0,33%	Unreliable	
2.	Depressiveness	5,47	5,00	-9,41%	0,964	+
3.	Anxiety	21,91	20,26	-8,13%	0,981	+
4.	Neuroticism	10,03	9,35	-7,23%	0,986	+
5.	Friendliness	6,76	7,09	4,56%	Unreliable	
6.	Openness	6,09	6,53	6,76%	0,988	+
7.	Emotional Lability	10,06	9,44	-6,54%	0,987	+

Source: formed by the authors

Thus, the complex of psychoprophylaxis measures we carried out with elderly patients who have coronary heart disease confirmed its effectiveness in 5 cases out of 7. The result obtained is undoubtedly positive, but necessitates the improvement of the proposed methodology. We note apart that Spearman's correlation coefficient in all 5 positive cases showed a high degree of correspondence according to the Chaddock's scale.

5. Conclusion

Summing up the results of our study of the psychological characteristics of the emotional state of elderly patients with coronary heart disease at the outpatient stage, we come to the following conclusions:

1) Well-timed and qualitative assessment of the emotional state of patients by clinical and psychological methods can be successfully used for the prevention of cardiovascular diseases and disorders associated with them if they are detected, for psychocorrection.
2) It was determined that negative trends in changes in the psychological states of elderly patients with ischemic heart disease at the stage of outpatient treatment include such

indicators as: alexithymia, depression, anxiety, neuroticism, decreased sociability, low openness and high emotional lability.

3) It is proved that there are significant differences in the psychoemotional states of men and women, which should be taken into account in the process of psychocorrection.
4) The use of a complex of psychoprophylaxis measures has shown that the psychoemotional state of elderly patients can be significantly improved in a fairly short time. The results of retesting showed a positive effect of the conducted exercises on the psychoemotional state of patients.
5) It's a pity that some indicators (alexithymia, sociability) were not significantly influenced in our study. That is, there is a need for further research and development of methods of psychological assistance for elderly patients with coronary artery disease, which would take into account the gender and age characteristics of patients.

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