

MEDICINE OF BORDERLINE CONDITIONS AS AN INNOVATIVE DIRECTION FOR THE DEVELOPMENT OF PREVENTIVE MEDICINE (REVIEW)

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Abstract

Reformation of domestic health care must take place not only on the basis of introduction of world experience but also taking into account the own experience received during realization of innovative developments in medical science. Medicine of the borderline conditions belongs to similar innovative developments that received priority financing of Ministry of Health of Ukraine, appreciation by the customers of the applied researches and support of European medical community. Medicine of the borderline conditions is scientifically justified direction of realization of primary purpose of health care, namely prevention of diseases, which is widely approved in practical activity. Thus, prevention of diseases takes place on the basis of determination of risks of development of certain diseases on individual and population levels, with establishment of orientation of this action on the certain systems and organs and body on the whole, that creates founding for directed correction of the educed pre-nosological states, averting their possible transformation into abnormal states. Acceptance of conception of medicine of the borderline conditions by a medical association can influence the revision of today's paradigm of health care, associated with definition of primary prophylaxis, as dominant direction in maintenance of individual health and health of population. Identification of a causal relationship between the action of unfavorable factors of various origins (professionally determined, educational process, environmental, etc.) with the definition of the acting force (substance, energy, information) and the likelihood of damage to the body of the corresponding etiology, is a prerequisite for the planned correction of the functional state of a person.

Keywords: *medicine of the borderline conditions, preventive medicine, occupational medicine, pre-nosological diagnosis, new paradigm of health care.*

Today, the reform of domestic health care sector is one of the most acute problems of our time. This is due to the complexity of the reform process, when the implementation of the “Western” model of health care must also take into account domestic achievements in medical science and practice [1, 2]. First of all, it concerns the generalization and comprehension of medical experience in the field of preventive medicine in order to introduce effective innovative measures to preserve health of the population, ensure adequate conditions for human growth, maturity and life expectancy. At the same time, occupational medicine is a

separate branch, which takes care of the safety of the most problematic period of human life [3, 4]. Occupational medicine specifically combines two mandatory components of medical science and practice – preventive and clinical directions.

In recent years, developed states have begun to recognize the intersectoral nature of public health. The current health care paradigm, as well as the factors and conditions that led to its crisis, were formed within the framework of these strategies [5].

The results of many years of research conducted at Kharkiv National Medical University, as well as representatives of other universities that took their origin from Kharkiv school of hygiene, including department of hygienic and clinical specialties, gave a new understanding of the patterns of pathogenesis. They allowed to see health and disease as critical manifestation of on process – sanogenesis,

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between which lies a wide range of pre-nosological conditions and processes that have a borderline nature [6].

The ancient Roman physician Claudius Galen knew about borderline conditions, but systematic research on this problem was conducted by representatives of Kharkiv Scientific Medical School only in our time. According to the results of this study in the context of solving the problem of preserving health of young students working in hazardous conditions, as well as the population living in adverse environmental conditions, *medicine of borderline conditions*, a fundamentally new scientific direction, found theoretical justification and practical confirmation and awareness of its methodology resulted in a revision of the existing health care paradigm [7, 8]. In addition, medicine of borderline conditions, as an innovative direction in health care, is a concept whose methodology is based on the millennia-tested axiom of Hippocrates, who defined that “the disease is easier to prevent than to cure”, which has nowadays acquired not only personal, but also socio-economic sense [9, 10].

Medicine of borderline conditions is a field of medical science dealing with general patterns of formation of pre-nosological conditions and the transient processes of their transformations. The purpose of medicine of borderline conditions is to prevent somatic and mental diseases of different origin, by diagnosing their primary signs and risks of development with subsequent adjustment of the functional state of the body.

The author's logos regarding the definition of borderline conditions and medicine of borderline conditions are shown in Figures 1 and 2, respectively.



Fig. 1. Logo “Borderline conditions”.



Fig. 2. Logo “Medicine of borderline conditions”.

Medicine of borderline conditions is an integral part of such an innovative direction of world science as *limitantology* (from the Latin *limitans*, *-antis* - borderline, boundary), the science of borderline (limitary) conditions and the processes of their transition [11]. In addition to the medical field aimed at studying pre-nosological conditions, limitantology involves implementation of the following scientific areas: solid state physics (competitive behavior of crystals); thorns and other common features of animate and inanimate nature; water and its intermediate states; transitional life forms (viruses, prions); psychology (marginality, as a borderline form of existence of an individual); sociology (revolution and thermidor); chronobiology (transitional days of the year); age physiology (adolescence); evolution (transitional life forms), etc. [12 - 14]. Medicine of borderline states is based on methodological principles, which have found practical confirmation in the study of the health of different age, sex, place of residence and occupation of the population [15, 16].

The *first principle* is **health centrism**. It prioritizes health over all other components of a person's existence (educational, environmental, economic, legal, etc.). All these factors are considered only as separate health-forming components, each contributing to a certain aspect of health formation. Therefore, maintaining good health is an integral part of human life.

The health of different populations is directly affected by lifestyle, environmental living conditions, quality of care, and hereditary factors. In this case, the whole set of vital factors is divided by their direction into two

antagonistic groups: risk factors (which become the subject of elimination) and health factors (which become the subject of use).

For example, the most significant risk factors for different populations of young students include excessive information and emotional stress associated with unhygienic features of cognitive activity. Conversely, physiological capabilities of the nature of learning, which contributes to the emergence of work stress, is an indisputable health factor in the living conditions of young people [17, 18].

The second principle is dialectic of transient processes. It is based on the assertion that human life is built on objective laws inherent in transient processes, which combine a certain sequence of borderline conditions on the way to achieving a stable state of the body (adaptation).

1. General patterns of the adaptation process: staging, the presence of adaptive reactions (evolutionary and individual experience), limitation of adaptation capabilities and their compensation, dynamism and hierarchy of adaptation systems, the principle of achieving a new quality state, the phenomenon of self-regulation and “adaptation price”.

2. The law of adaptive transition: transition of the body to a state of adaptability is due to energy and plastic resources accumulated in past adaptive experience, through the destruction of former useful links in the leading biological system, which previously provided a stable state, by forming a new dominant system [19].

3. The phenomenon of complementarity (mutual complementation): achievement of the desired result (education while maintaining health) is achieved under the categorical condition of compliance with the nature of the functional (adaptive) capabilities of the body, and the relationship between the subject of cognitive activity and its factors are complementary [20].

The third principle is methodological sequence. It determines that the procedure for the practical implementation of the principles of medicine of borderline conditions, aimed at maintaining the mental health of young students, includes hygienic pre-nosological psychodiagnosis, correction of functional and mental state of the body and evaluation of the effectiveness of these actions [21].

Stages of the program implementation:

Stage I – determination of the level of health of the studied contingent with emphasis on the prevalence of certain diseases, probably related to the impairment of systems and organs that belong to the “targets” of adverse environmental factors or heredity; **Stage II** – identification of environmental factors that belong to the risk factors in relation to deterioration of health of the studied contingent due to the general and targeted pathogenic effects on the body and individual systems and organs; **Stage III** – determination of indicators of the functional state of the body, which belong to the criteria of the pre-nosological state, on the basis of measuring the level of realization and stability of psychophysiological and physiological functions, paraclinical indicators of homeostasis; **Stage IV** – determination of psychodiagnostic indicators, which belong to the signs of conditions and periods of increased risk of mental health disorders; **Stage V** – elaboration and implementation of preventive measures, including individual and group measures of psychohygienic, adaptogenic, sanogenic and regime-organizational nature, aimed at disease prevention on the basis of hygienic pre-nosological diagnosis data; **Stage VI** – assessment of the effectiveness of the implemented measures based on the analysis of the time course of health and functional status of the subjects according to the criteria of pre-nosological diagnosis (feedback principle) [22].

The fourth principle is evidence. It is claimed that the implementation of the program of medicine of borderline conditions in health care involves the inclusion of standardized methods for measuring indicators of mental and functional states and objective criteria for their evaluation.

Hygienic pre-nosological psychodiagnosis involves the use of generally accepted and widely tested research methods. Assessment of living conditions of student youth implies identification of risk factors based on the measurement of sanitary indicators comparing them with existing state hygiene regulations, as well as the use of standardized questionnaires. Determination of the etiological relationship between risk factors and the consequences of their effects on the population of young students and specific individuals involves the use

of an epidemiological method to study the disease. Prospective analysis of the time course of mental and functional state is given on the basis of a comprehensive research program, which includes the most common and proven research methods [23].

Common, interrelated criteria for the risk of adverse health effects in the “human being-environment” system are: 1) quantitative deviation of the environment and functional status from the norm (sanitary and physiological, respectively); 2) qualitative deviation of the state of the environment and the functional state of the body, which is manifested in the nature of external influence (separate, combined, complex, simultaneous action) and the corresponding reaction of the body, which is manifested in the formation of pathogenesis.

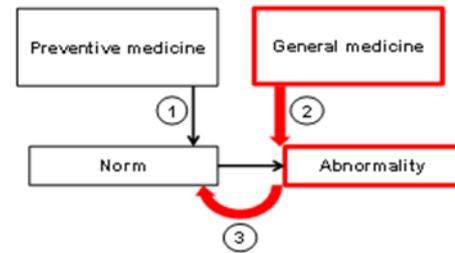
Standardized and evidence-based methods for quantitative assessment of pre-nosological states are based on the theoretical foundations of the adaptation theory, through the introduction of the most informative indicators of pre-nosological states and scientifically justified criteria for their qualitative and quantitative assessment, which include: 1) achieving a certain level of realization of psychophysiological functions (primarily those that determine productive cognitive and professional activity); 2) the ability of the body to maintain the achieved level of realization of psychophysiological functions during the generally defined educational cycle (daily, weekly, annual); 3) achieving a stable psycho-emotional state during the daily, weekly and annual training cycles.

The *fifth principle* is a **change in the paradigm of health care**. The prospect of implementing the principles of borderline medicine involves a revision of the set of values, methods, approaches, technical skills and tools adopted in the medical community within the existing scientific tradition.

The traditional model of health care is based on a clear non-alternative understanding of the categories of “health” and “disease”, as if the transition between these conditions is abrupt, without any previous qualitative and quantitative changes in the body (Fig. 3). But any doctor knows that this is not the case. Even the severity of the injury, and its very occurrence, is largely determined by the previous state of the body.

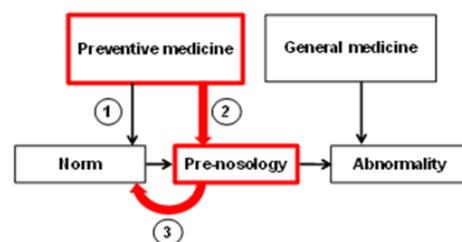
The new paradigm of health care, based on the theory of medicine of borderline conditions, states that the development of clinical forms of somatic and mental diseases is

preceded by certain dysfunctional disorders of pre-nosological nature (Fig. 4). These deviations can be measured, estimated and systematized.



- 1 - identification and elimination of risk factors
- 2 - clinical diagnosis, treatment, rehabilitation
- 3 - restoration of health of patients

Fig. 3. The existing healthcare paradigm



- 1 - identification and elimination of risk factors
- 2 - pre-nosological diagnosis and correction of the functional state
- 3 - prevention of the disease in healthy people

Fig. 4. A new paradigm of health care

Moreover, timely detection of these borderline conditions, detection and elimination of risk factors for their occurrence and their medical correction contribute to the preservation and promotion of health. And the cost of pre-nosological diagnosis is significantly lower than the whole range of medical-diagnostic and rehabilitation measures in case of a disease.

This is a new paradigm of medicine, which involves shifting the emphasis from the concepts of norm and abnormality to the concept of pre-nosology.

In addition, and perhaps most importantly, the proposed new health care paradigm focuses not on the patient but on the healthy person, and therefore fills the term “health care” with real meaning.

Thus, medicine of borderline conditions is scientifically justified, and widely tested in practice, the direction of the main goal of health care is disease prevention. The prevention of diseases is based on determining the risks of specific diseases at the individual and population levels with the establishment of the direction of this action on specific systems and

organs and the body as a whole, which creates a basis for targeted action to correct identified pre-nosological conditions, preventing their likely transformation in pathological conditions. The adoption of the concept of borderline medicine by the medical community can influence the revision of today's health care paradigm, which is associated with the definition of primary prevention as the dominant direction in maintaining the individual and population health of the population. Identification of the causal relationship between the action of adverse factors of various origins (professionally determined, educational process, environmental, etc.) with the definition of force (substance, energy, information) and the likelihood of damage to the body of appropriate etiology, is a prerequisite for planned correction of functional status.

Borderline medicine is one of the widely tested innovative branches of academic entrepreneurship on the basis of self-supporting activities. The commercial component of medicine of borderline conditions in recent years has been widely tested on the basis of current applied research in the field of occupational medicine in three interrelated areas: 1) hygienic studies of risk factors for occupational diseases; 2) occupational pathology studies on pre-nosological and clinical diagnosis of occupational diseases; 3) psychophysiological and psychodiagnostic studies to determine personal risk factors for health and life.

Perspective directions of development of preventive medicine on the basis of realization of innovative principles of medicine of border states include: 1) in the field of **public health** – revision of the current paradigm of health care on the basis of introduction of measures for definition of risk factors for human health (society) and correction of pre-nosological conditions; 2) in the field of **educational medicine** – hygienic pre-nosological diagnosis and correction of probable health disorders of students of different ages and educational groups; 3) in the field of **medical rehabilitation** – hygienic optimization of living conditions and disease prevention among children and adolescents suffering from congenital and acquired defects of vision, hearing, intellectual development, deviant behaviors.

Conclusions

1. Borderline medicine is scientifically justified, and widely tested in practice, especially

in occupational medicine, the direction of the main goal of health care is prevention of diseases, including diseases of occupational origin. The prevention of diseases is based on determining the risks of specific diseases at the individual and population levels with the establishment of the direction of this action on specific systems and organs and the body as a whole, which creates a basis for targeted action to correct identified pre-nosological conditions, preventing their likely transformation into abnormal conditions.

2. Adoption of the concept of borderline medicine by the medical community, can influence the revision of the current paradigm of health care, associated with the definition of primary prevention as the dominant direction in maintaining individual and population health. Identification of the causal relationship between the action of adverse factors of various origins (professionally determined, educational process, environmental, etc.) with the definition of force (substance, energy, information) and the likelihood of damage to the body of appropriate etiology, is a prerequisite for planned correction of functional status.

3. Promising areas of implementation of the principles of borderline medicine are the fields of occupational medicine, public health, rehabilitation, school medicine, etc. Different areas of implementation of the proposed concept are combined on the basis of general patterns of formation of the adaptation process outside the type of external influence on the body. However, taking into account the peculiarities of the nature of the impact on certain functional systems of the body form a specific, complex of individual, group and population preventive measures, aimed at correcting a certain range of pre-nosological functional disorders, to correct the adaptation process.

Declarations

Statement of Ethics

The author has no ethical conflicts to disclose.

Consent for publication

The author gives her consent to publication

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