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Individual Health: In Search of Essence and Measurement Criteria

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ABSTRACT

The Purpose of the Study: *Consider a second laws of thermodynamics to assessing the body's resistance to adverse influences. Substantiation of health entity and its operational definition. Creating a simple diagnostic assessment system health level.*

Material and Methods: *In the multi - year studies defined the relationship of the health of the clinical - physiological indicators of thousands of healthy and sick people, the manifestation and the prevalence of risk factors of noninfection diseases.*

Results of the Study: *Methodology and simple diagnostic method of somatic health based on the indirect determination of the maximum capacity of aerobic. Proven correlation with the level of health risk factors for noninfection diseases and their prevalence. Describes the phenomena of "safe level" of health and self - development "pathological process when an individual from the" safe zone "of health.*

Keywords: *individual health, individual health Diagnostics, essence of health, definition of health*

INTRODUCTION

In medicine there is a paradox that nobody notices: putting the aim the achievement of health, she engages in illness. But a health is not absence of illness. A health and illness are the states, in basis of that different mechanisms and different methods of gaining end. Id est: treatment and making healthy are quite different technological processes. But conformity to law must be one: more health - less illness, and vice versa. If we could measure a health, then would get the powerful prognostic factor of predisposition to illness.

A BIT HISTORY

The problem of individual health medicine investigates more than two thousand years. The result of these researches represented R. Doll [1]: «Were many attempts to build the scale of positive health, but until now measuring of health remains the same illusion, as measuring of happiness, beauty and love». And it is logical, because «well-being» (a keyword is in definition of health of WHO) the same abstractly-logical category, as happiness and beauty, and them it is impossible to describe quantitative criteria. For the decision of problem it is necessary to step back from the criterion offered to WHO, and offer new - real is a criterion of health. Thus for those, who investigated a problem deeply, obviously, that the great number of aspects of health dictates the necessity of narrowing of this category to the limits, giving an opportunity to give operational definition of health. Operational determination - the necessary condition of translation of general abstract judgement is scientific in the exactly delimited realities that can be reproduced identified. Such determination must contain rules describing a method, what the state of object it is necessary that to manage (2) can be standard described.

The first step on this way was done by a prominent soviet pharmacologist-toxicologist N. Lazarev (1895-1974). In 50th of XX of century, when he managed the department of pharmacology of the Naval medical academy (where the author of the article studied then), under his guidance scientific direction that went out outside the generally accepted ideas about a health was born.

From times of Galen's three ground-states of man - health, illness and transitional state were distinguished. N. Lazarev and his students proved existence yet and of the fourth state -

State of hetero specific Enhance able Resistibility (SHER), at that a man not simply feels healthy, but disposes the yet and certain "margin of safety", that provides to him the best terms for a survival (3). Attaining this state maybe by means of different common healthy influences, among that the special role is played by natural facilities that N. Lazarev named “adaptogens”. N.Lazarev and his school showed that SHER was characterized by two basic system reactions of functions of organism - expansion of functional reserve and economisation of functions. And these reactions show up on a background the increase of power of intracellulare generation of energy due to perfection of vehicle of mitochondries.

It is today possible to assert that exactly N. Lazarev foundation was prepared in order that his student I. Brehman grounded the necessity of selection of individual health for the independent article of research (4). At the same time, not belittling the merits of I. Brehman, we will specify that examining the problem of individual health, he in the researches spared basic attention to development of practical aspects of the use of adapto gens, influence of them on the state of functions of healthy people, but not phenomenology of health.

We took part in researches that today can not be repeated on considerations bioethics(terms of offensive of hypoxic coma for divers at breathing by hypoxic mixture, physical capacity to- and after massive loss of blood, loud speaker of professional capacity of operators in the conditions of multimonthly influence of complex of unfavorable factors of environment of and other). The analysis of results of these researches showed that a general sign of stability of organism of man is to unfavorable influences is energy potential of the biosystem (that answers the second law of thermodynamics). And than more formation of energy on unit of mass of organism, the more effective the biological function of survival comes true. At organism level energy potential of the bio system can be described by - maximal consumption of oxygen (MCO; ml\of kg of mass\of min) that reflects the state of function of mitochondries, and his increase is accompanied by the system reactions of organism - expansion of functional reserve and economisation of functions, i.e. by the same signs of SHER, that is described by school of N. Lazarev

THEORETICAL AND METHODICAL BASES

A health in a great deal yet is an abstractly-logical category, and the theoretical analysis of her essence is possible only by means of models. Functional approach in accordance with that the health of man it is necessary to estimate through his ability to carry out natural vital functions - biological and social is perspective in this plan. Perfection of these functions for a man can be described - including in number - by backlogs of, plastic and regulator their power providing. Taking into account the higher levels of organization of man the displays of health are formed. Exactly on these principles definition of somatic health is built. A somatic health is this dynamic state of man, that is determined by backlogs of mechanisms of self organisation (by stability to influence of pathogenic factors and ability to compensate a pathological process), characterized by the power, plastic and informative (by a regulator) providing of processes of self organisation and also is basis of display of biological (survivability is maintenance of individual, reproduction is maintenance of kind) and social functions.

Major difference of this determination from the great number of other definitions of health - it him, id est presence of the fully identified criteria - mechanisms of self organisation of the bio system (adaptation, homoeostasis, reactivity etc.); power, plastic and informative backlogs of their providing; displays of health, on the basis of that the scale of health can be built. For today there are not other determinations of individual health, possessing the signs of operationality.

What from the operational criteria of health is it necessary to choose for the practical use? In theory it is possible to create a model, where will find the reflection all or part of signs, but quite obviously, that this will be a bulky and uncomfortable model. It is necessary to be stopped for one criterion, the phenomenon of life will disappear with disappearance of that. Such criterion is survivability, i.e. the viability (5), provided by the model specialized structures. But without energy - there is not life.

Position about sources and character of energy, providing functioning living systems, about applicability to them the second beginning of thermodynamics is outspoken by E. Bauer in 1935. He is set forth principle of "steady non-equilibrium"; exactly continuous is a cardinal difference living from lifeless. Coming from this parcel, E. Bauer set forth the basic law of biology : "All and only the living systems never

are in an equilibrium and carry out due to *the free energy* constantly work against the equilibrium required by the laws of physics and chemistry.". (6).

About applicability of the second beginning of thermodynamics to the living systems a prominent physicist E. Schredinger talked in the lectures read in 1943 in the Dublin university(7). Researches in that we took part talk about the same: than more reserve of energy on unit of mass of the living system, the she more tamperproof.

Thus, the problem of measuring of degree of viability that can characterize a somatic health level abuts against the problem of estimation of potential of aerobic energy, that, in turn, testifies to efficiency to activity of vehicle of mitochondries. From the physiological point of view this index integrally characterizes the state respiratory, sanguiferous and metabolic functions, with biological is a degree of stability (to viability) of the non-equilibrium system - living organism.

Taking into account that direct measuring of MCO difficult and labour intensive procedure, our methodical approaches of estimation of viability reflecting the basic function of health are survivability, based on the mentioned above system reactions, reflecting the state of aerobic energypotential. The simplest indexes of functions, characterizing functional reserve (power and respiratory indexes) and economisation of functions («double work» and time of renewal of heart rate after 20 s quat after 30 sec.), are used. A IBM- index is included in the diagnostic system. Indexes are ranged, the point is appropriated every grade, and the sum of points is characterize a health (of viability level) (8). It is set that the sum of points has a high coefficient of correlation with the maximal consumption of oxygen (about 0,8). 5 health levels are distinguished.

Results of Researches

Small labour intensiveness and cheapness of the use of the indicated diagnostic system, availability of her for qualification of middle medical staff allowed to undertake studies of many thousands practically of healthy and sick people 80 from 6 to that gave an opportunity to educe and describe the new phenomena of individual health (9, 10 and other) :

- having the opportunity to «measure» an individual health, it is possible to build the «scale of health»;
- what higher health level, the less probability of development of endogenous risk and demonstrated forms of ischemic heart trouble factors;
- *there*is*a «safe» health level*, neither endogenous risk factors nor demonstrated forms of diseases are higher than that determined; him quantitative description is given to (12MET for men and 10 MET for women);
- on leaving of individual from the «safe zone» of health*the phenomenon of «self devolopment» of pathological proces*is marked;
- there is reverse development of endogenous risk of ishemic heart disease (IHD) factors at the increase of possibilities of aerobic energy;
- having quantitative indexes, it is possible to manage(to form, save, restore) a health;
- return in the «safe zone» of health practically healthy people is the most effective way of primary prophylaxis of chronic uninfectious diseases(«preventive rehabilitation»).

Researches also showed high cross-correlation iesdeprhon, and also risk of IHD factors. Thus, it is possible to assert that a single leading risk of development of IHD (and, probably, and other noninfection disease) factor - insufficiency of functions of mitohondries, going beyond the limits determined by the laws of evolution (5, 11), is. All other endogenous risk factors- only investigation of it.

The analysis of literary and own data allowed to ground conclusion that direct reason of epidemic of noninfection disease, overcoming the world in the second half of XX-го of century and being principal reason of death rate in the modern world, is the mitochondrial insufficiency conditioned by the row of social, socially-hygienical and hygienical factors, including by the way of life of modern man and contamination of environment. It is set as a result of researches of many thousands of the Ukrainian population, that now only an about 1% population is in the «safe zone» of health, what is basis of depopulation and quick-ageing(25 back this index made 8%).

Discussion

It is the last years got convincing enough proofs of informing of indexes of specific MCO in relation to viability of individual and development of IHD. Group of the Norwegian researchers(12), inspecting more than 4600

practically healthy men and women, marked that with the index of MCO/of kg of mass/of mines below 35 mls in 5 times, and for men below 44 mls/of kg/of mines in 8 times more often meet risk of development of cardiovascular diseases (factors we will mark: our criteria of «safe health level» - 35 and 42 mls/of kg of mass/of mines accordingly). Thus every decline of specific MCO on 5 mls is accompanied by the increase of expressed and prevalence of risk of cardiovascular morbidity factors on 56%.

The discussed dependence finds the reflection and in a clinic. Keteyian and other (13) showed that every increase of specific MCO on a 1 ml was accompanied by the decline of risk of death and women with IHD on 15%. Myers of and other mark that increase of maximal aerobic ability on 1 MET accompanied by the increase of survivability of men with cardiovascular diseases on 12%.It is shown in other researches, that length of telomers, life-span follows with that, is straight proportional (r=0,78) to maximal aerobic possibilities of individual (15). In long-term researches of institute of gerontology Ukraine it is set that between functional age and MCO/of kg of mass of individual there is the close dependence described by the coefficient of correlation 0,840 for men and 0,813 for women (16).

In respect of our methodical approaches, then they were appraised in comparative research of the Russian scientists showing (17), that our methodology of estimation of health level possesses a higher informing value by comparison to other methods.

Consequently, MCO/of kg of mass/of mines really reflects a health level and can serve as the integral criterion of viability and biological age. The results of our researches demonstrate possibility of receipt of indirect information about this index with the use of simple methodical approaches, that approaches him to realization in the primary link of health protection.

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