

Research Article

Psychological aspects of adaptation in patients with age-androgen deficiency

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ABSTRACT

The evaluation of the patient’s psychological state and mood is of great importance, because mood and emotions are able to have a positive or negative impact on the course of any disease and the treatment measures efficacy. The evaluation of the initial psychological state is especially important in the case of age-related androgen deficiency (VAD) - a pathology closely related to such a concept as the quality of life. The results of the psychoemotional status study of patients (VAD), assessment of personal and situational anxiety indicators, and their relationship with physical and social adaptation had been

presented. The interrelations between the level of the body functional reserves preservation and the state of mental health had been revealed. The indicators of personal and situational anxiety is correlated with the psychological health indicators (MH) and social functioning (SF).

Keywords: Age androgen deficiency, Erectile dysfunction, Psychological health, Personal and situational anxiety, Quality of life, Functional reserves of the body, Rehabilitation potential, Adaptation

Background

Evaluation of the human body adaptive capacity includes both an assessment of the physiological mechanisms state and reactions from the central nervous system, as well as the social conditions in which the patient exists. The psychological state of patients is a subject for serious scientific research and is completely justified as an important component of any systematic scientific research. Depression is a very common emotional disorder and can accompany existing physical disorders or become their cause. A correction of emotional disorders, as a rule, has a beneficial effect on the course of the disease.

Both age androgen deficiency and accompanying erectile dysfunction are being a common cause of depressive and neurosis-like conditions in patients, leading to a deterioration

in the quality of life and a decrease in the ability to work. Undoubtedly, in humans, as a social being, all biological reactions to various factors of the external environment are being realized through social factors. It is quite natural that the “social” and “biological” in a person is inextricably linked, and that social life is reflected in the biological properties of a person, and the state of his health influences the social sphere of human activity. At the beginning of the 21st century, the concept of “quality of life” turned into a subject of scientific research and became more accurate - “health related quality of life, HRQL” [1,2].

Evaluation of the body adaptive capacity serves as the basis for the rehabilitation prognosis, but the technology of this assessment today is quite a complicated problem. Representatives of preventive medical-biological and alternative medicine offer each of their evaluation criteria, mainly adapted to distinguish

between illness and health conditions or determine the health level [3,4]. At the same time, other criteria are being required for clinical practice. In clinical studies and therapy of diseases, the appropriate methods for diagnosing adaptive disorders that would allow assessing the biological resources of a sick organism against the background of chronic pathology, determining the extent of the permissible therapeutic impact and evaluating the medical influences efficacy are needed. These targets set our attention to the notion of rehabilitation potential [5-7].

Rehabilitation potential is not only a complex of biological and psycho-physiological characteristics of a person, but it also includes a number of social and environmental factors that allow to more or less realize its potential. The concept of rehabilitation potential is somewhat wider than the reserves of adaptation, because it considers the personality characteristics and their implementation in the society, and not only physiological possibilities.

In the structure of the rehabilitation potential, three components are clearly visible: biological, psychological and social [7]. The psychological component is very important in determining the rehabilitation capabilities of the patient and is closely related to such a concept as the quality of life (QOL).

The main tool for the study of QOLs are profiles (assessment of each component of QOL separately) and questionnaires (for integrated assessment). They do not show the clinical severity of the disease but reflect how the patient tolerates his illness.

In the clinical picture of androgen deficiency, the following items can be identified: changes in the neuro-emotional status, manifested by increased irritability, decreased concentration of attention, cognitive functions, creative productivity, memory, depression and somatic disorders (decrease in muscle mass and strength, increase in fat tissue, osteoporosis, changes in lipid and carbohydrate metabolism, cardiovascular diseases). Erectile dysfunction (ED), both associated with testosterone deficiency, and/or other causes, is a condition in which the psychoemotional component of the rehabilitation potential is of particular importance. It is in the correction of psychoemotional status in individuals with age-related androgen deficiency that we see additional reserves for use in treatment other than replacement therapy.

Purpose of study: to study the psychoemotional status of patients with age-related androgen deficiency, the relationship with personality characteristics and social adaptation.

Methods

Design

The study was conducted on the Scientific center of urology (Almaty), the National medical research center for rehabilitation and balneology (Moscow) and the medical center of RUDN University (Moscow) from 2011 to 2015. The survey included 211 patients aged 40 to 60 years, first applied on an outpatient basis in connection with sexual and reproductive dysfunction, who agreed to participate in the study through the signing of informed consent. The diagnosis of age-related androgen deficiency established in accordance with the recommendations

of ISSAM [8]. From 138 patients was diagnosed primary androgen deficiency (observation group), in 73 - the level of testosterone in the blood was normal (comparison group).

Ethical Consideration

The study was conducted in compliance with the principles of medical ethics. The conformity to standards of biomedical ethics was confirmed by the conclusion of the Ethics Committee of the National medical research center for rehabilitation and balneology (Protocol №22 of October 28, 2013). Participants were fully acquainted with the objectives of the study, its importance, and method of selecting participants, the right to refuse to participate at any time, the benefits and risks of the study.

Instruments and Data Collection Procedure

Diagnosis of erectile dysfunction was carried out in addition to examining patients' complaints, collecting anamnestic data, the results of objective research (examination and manual examination of external genital organs, neurological examination of genital reflexes), laboratory data using the assessment of the erection adequacy for a pharmacological test and Rijiskan monitoring. Sexual activity was assessed using the IIEF questionnaire [9,10]. The IIEF-5 score is the sum of the ordinal responses to the 5 items. 22-25: No erectile dysfunction; 17-21: Mild erectile dysfunction; 12-16: Mild to moderate erectile dysfunction; 8-11: Moderate erectile dysfunction; 5-7: Severe erectile dysfunction.

Quality of life was assessed by the questionnaire "SF-36 Health Status Survey". The psychological status was studied with a Short instruction to application of the reactive and personal anxiety scale of C.D. Spielberger - State-Trait Anxiety Inventory (STAI). We assessed reactive (RA) and personal (PA) anxiety on a scale of 20 to 80 points. Indicative criteria up to 30 points – low anxiety, 31 - 44 points - moderate; 45 and more - high.

Criterion for the distribution of patients in groups was the preservation of the functional reserves of the body according to the level of the indicator of adaptive compliance (IAC). IAC was developed a formula for calculating indicator of adaptive compliance (IAC) using the method of computer simulation method of segmentation of images with a given confidence level (OR) 99,8% (patent RU 2342900 C1) by means of an automated assessment (certificate of official registration No. 2007614560).

$IAC = 0.011 (P-P^*) + 0.014 (S-S^*) + 0.008 (D-D^*) + 0.009 (W-W^*)$, where:

P - actual heart rate (beats / min);

P* - the pulse rate is ideal within the limits of the age norm (beats / min.), which is determined from the table; S - systolic blood pressure actual on average per day (mm Hg);

S* - systolic blood pressure is ideal (mm Hg), which is determined from the table;

D - the diastolic blood pressure actual on the average for a day (mm of a mercury column);

D * - diastolic blood pressure is ideal (mm Hg), which is determined from the table;

W - actual body weight at the time of examination (kg);

W * - ideal body weight (kg), which is determined by the formula.

IAC from 0 to 0,3 - functioning of the body compensated by their functional resources or medical correction; IAC is bigger than 0,3 - functioning of the body are disrupted, own resources of the organism are exhausted, and medications are not fully compensating the existing violations. The problem of mathematical calculations was solved through the development of computer program «Software determine the level of functional state and compensatory abilities of the body» (official registration Certificate № 2007614560 from 30.10.07г.).

Data Analysis Procedures

Processing of received data - Program STATISTIC 10,0 (Matemtica®, Matlab®, Harvard Graphics®) Stat Soft). Descriptive statistical measures including frequency and percentages were used to describe.

Results

At the beginning of the study, 100% of patients complained about a decrease in sexual activity, the overall index on the IIEF scale was 5.6 ± 1.2 points. In both groups, urogenital disorders predominated, noted in almost 100% of the examined, psychoemotional and somatic disorders were encountered with high frequency. Very often, somatogenic manifestations of androgen deficiency, the patient himself and his environment, including the doctor, were regarded as signs of a somatic disease. In such patients, we conducted a comprehensive examination with the advice of a specialized specialist (cardiologist, endocrinologist, etc.).

It was found that 67 (82.7%) patients had manifestations of age-related androgen deficiency in patients in the age group of 40–60 years with a low rehabilitation potential ($IAC \geq 0.3$). In patients with satisfactory RP ($0 \geq IAC < 0.3$) in 29.6% (16 people), with a high RP ($-0.3 \geq IAC < 0$) in 35.5% (27 people) of the cohort being under the observation (Figure 1). The obtained data confirm that for the male organism showing the androgen deficiency affects the indicators, which characterize the overall level of the organism biological resources and can influence both the course of various diseases and their treatment and rehabilitation efficacy.

Clinical manifestations of androgen deficiency had significant differences in various groups of patients (Figure 2). In patients with a low level of rehabilitation opportunities, vegetovascular and psychoemotional disorders were more frequent ($p < 0.001$).

In the quality of life assessment (SF-36) surveyed, a decrease in the level of physical functioning (PF), role (RD) and emotional (RE), especially in the group of patients with a low level of rehabilitation opportunities, was noted. In patients

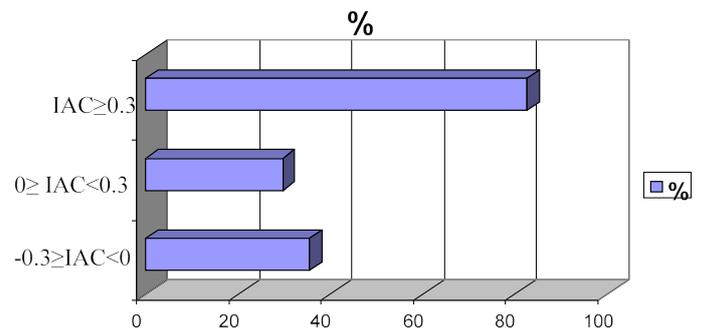


Figure 1. The frequency of the androgen deficiency occurrence, depending on the preservation of the body functional reserves

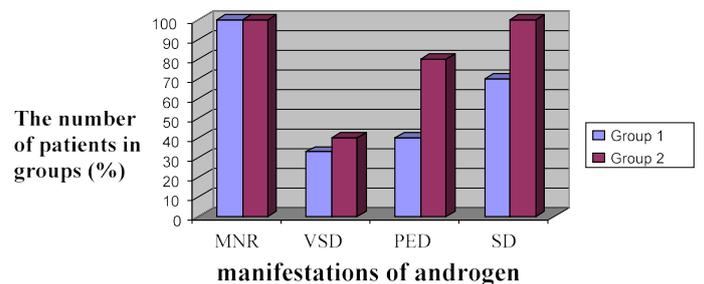


Figure 2. Clinical manifestations of androgen deficiency depending on the safety of functional reserves.

MNR - genitourinary disorders; VSD - vegetovascular dysfunction; PED - psychoemotional disorders; SR - somatic disorders.

of this group, physical activity, social functioning were almost two times lower, they had more pronounced manifestations of somatic disorders and painful sensations. Thus, the level of psychological health also declined. In patients with age-related androgen deficiency and a sufficient level of preservation of functional reserves, there was also a decrease in social activity, role functioning and psychological discomfort, but the level of this decrease was less pronounced than in patients with $IAC \geq 0.3$ (Table 1).

The reliability of the differences was highly accurate in almost all indicators.

In patients with age-related androgen deficiency, the level of situational anxiety as a whole in the group ($SA = 48 \pm 4.6$ points) was quite high, regardless of functional reserves status, which indicated the presence of psychological stress in the majority of patients with age-related androgen deficiency. However, we can not ignore the motivations of the SA, especially if we consider that these were patients who actively sought help. The index of personal anxiety in patients with a low level of functional reserves was high (49 ± 3.1), in comparison with the index of patients of the other group (44 ± 4.4), which showed moderate anxiety. The indicators of situational (SA) and personal anxiety (PA) correlated closely with the indicators of psychological health (MH) and social functioning (SF).

The reactive anxiety index of the TC had a negative correlation with psychological health, and personal anxiety turned out to be directly dependent on the pain manifestations (P) $r = 0.32$ and in inverse relationship to social functioning ($r = -0.48$) and psychological health ($r = -0.34$) (Table 2).

Table 1. Assessment of patients' quality of life by questionnaire SF-36

| Indicator | Group 1 (IAC<0,3) n = 43 | Group 2 (IAC≥0,3) n = 67 |
|--------------------------|-----------------------------|-----------------------------|
| Age (years) | 47,2±6,3 | 49,3±6,9 |
| BMI (kg/m ²) | 20,7±2,0 | 28,6±2,6 |
| PF | 44,6±11,1 | 25,5±5,8** |
| RD | 21,2±8,5 | 14,0±8,4** |
| P | 18,9±9,8 | 30,8±7,2** |
| GH | 43,5±7,5 | 27,4±9,3** |
| VT | 48,5±8,1 | 35,0±12,5* |
| SF | 42,3±7,9 | 26,7±8,3* |
| RE | 41,0±13,7 | 34,8±11,3* |
| MH | 49,0±8,4 | 31,7±9,5** |

BMI - body mass index; PF - physical functioning; RD - role functioning; P - pain; GH - general health; VT is the viability; SF - social functioning; RE - role-emotional functioning; MH - mental health.

* - P < 0.01 ** - P < 0.001

Table 2. The relationship between the main indicators of quality of life (SF-36), the level of anxiety (Spielberger Scale)

| Indicator | PF | RD | P | GH | VT | SF | RE | MH |
|-----------|--------|--------|-------------|--------|--------|---------------|--------|---------------|
| RA r | - 0,25 | - 0,06 | 0,26 | - 0,02 | - 0,09 | - 0,16 | - 0,24 | - 0,44 |
| P | 0,11 | 0,70 | 0,10 | 0,91 | 0,56 | 0,30 | 0,14 | - 0,004 |
| PA r | - 0,15 | 0,19 | 0,32 | - 0,14 | 0,12 | - 0,48 | - 0,16 | - 0,34 |
| P | 0,35 | 0,23 | 0,04 | 0,39 | 0,45 | 0,001 | 0,33 | 0,03 |

RA - reactive anxiety; PA - personal anxiety. anxiety and personal (PA)

Discussion

The onset of such a disease as androgen deficiency is always accompanied by emotional reactions including shock, fear, anxiety, protest. The patient is changing self-esteem, there is a sense of inferiority, dependence on medications, fear of possible complications. According to psychologists, the formation of attitudes toward the disease passes through five successive stages: denial, protest, trade, introspection, acceptance. To a certain extent, the choice of therapeutic tactics and the effectiveness of medical rehabilitation are determined by which of these five stages the patient falls under our supervision.

A rational tactic in the denial phase is to enable the patient to express his experiences, provide explanations regarding his condition, if any, to express support. During this period, all medical events are held with the minimum necessary comments, long-term forecasts are not discussed in detail. The stage of protest is accompanied by an aggressive attitude of the patient and negativism in relation to any recommendations related to the disease. At the stage of "trading" the patient begins to realize the changed life situation but tries to "concede" the disease as little as possible. Most of the patients included into our study came to us precisely at these three stages, which was reflected in the results of the psychological state assessment.

The psychological and social components of the rehabilitation potential are an important factor in the overall assessment of the body state and should be considered in conjunction with the assessment of the biological (basic) component. It is necessary to carefully evaluate the psychological state of the patient, be able to recognize the degree of taking the disease, which can help doctors who treat patients with diabetes to avoid many mistakes, to choose the best tactics in accordance with the position of the patient.

Conclusion

The appropriate patients' with age-related androgen deficiency psychological status definition and correction are of great importance. While assessing the quality of life (SF-36), the level of physical functioning (PF), role (RD) and emotional (RE) decreased, especially in the group of patients with a low level of rehabilitation possibilities (up to 0) were mentioned. The level of social functioning and psychological health also declined.

Medical care for patients at any stage (hospital, outpatient, rehabilitative) is aimed at preserving the body's resources, maximizing the restoration of impaired functions and ability to provide vital activity when combined with favorable socio-environmental factors. The questions of rendering medical aid are directly related to the assessment of the prospects and the therapeutic effects results forecasting, taking into account the patient's body capabilities.

Authors' Contributions

Irina Kurnikova was a major contributor in writing the manuscript and analyzed and interpreted the data of patients. Yerzhan Sulemenov, Valery Sergeyev and Pavel Popov participated in the examination of patients and collection of material. Tatyana Kochemasova contributed to manuscript preparation. All authors read and approved the final manuscript.

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