Институт по биология и имунология на размножаването - БАН
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OPINION STATEMENT

by Professor, Dr. Mihail Angelov Boyanov, Doctor of Medical Sciences, Department of Internal Medicine, Faculty of Medicine, Medical University – Sofia

Member of the Scientific Jury member of the Scientific Jury for conducting the procedure for awarding the educational and scientific degree "Doctor" at the Institute of Biology and Immunology of Reproduction "Acad. K. Bratanov" – BAS

to **Georgi Vladimirov Lazarov, MD**

Theme of the dissertation: "Etiopathogenesis of hypogonadism in young men", Professional field: 4.3 Biological Sciences; Specialty: "Animal and Human Physiology"

Scientific consultants: Prof. Dr. Filip Kumanov, MD; Prof. Dr. Stefan Lolov, MD

1. General presentation of the procedure and the doctoral student

Dr. Georgi Vladimirov Lazarov has presented a set of materials on an electronic medium, which is in accordance with the requirements of the Act on the Development of Academic Staff in the Republic of Bulgaria and the relevant Regulations for its implementation. The set includes an abstract, dissertation, CV, publications and scientific participations - lists.

I have no remarks or comments on the documents.

2. Relevance of the topic and appropriateness of the set goals and objectives

The topic of the dissertation is dedicated to changes in the levels of sex hormones, prostate volume, erectile function and miction disorders in relatively young men (before the expected onset of age-related decline, andropause). The relevance of this topic is undeniable for 2 reasons. First, the sedentary lifestyle and high level of daily stress, together with overweight and poor physical shape, are a clear reason for the increase in the frequency of such cases. On the other hand, expectations for a high quality of life, regardless of age and lifestyle, are causing more and more men to seek specialized medical care. Therefore, the detection of initial changes at a younger age is becoming more frequent. At present, these changes have not been fully studied, and data on the Bulgarian male population are scarce to non-existent. All of the above increase the relevance of the doctoral student's work, with potential scientific and practical contributions to clinical practice.

3. Knowledge of the problem

The literature review on the topic under consideration covers 24 pages of the dissertation work (approx. 20%). The various factors related to androgen deficiency, micturition and metabolic disorders, prostatic hyperplasia and erectile function are sequentially examined. The presentation is clear, sufficiently in-depth and explains the choice of topic and methodology of the present work.

The literature review includes 249 literary sources, of which 10 - by Bulgarian authors. There are almost no titles from before 2000. The reference base presented in this way is contemporary, accurately reflects the state of knowledge to date and is a solid basis for substantiating the dissertation work. In addition, the in-depth literature review shows the good knowledge of the topic, as well as the accumulated practical experience of the doctoral student, which have allowed a creative assessment of the state of the problem. The review ends with substantiated conclusions that presuppose the need for the scientific studies carried out.

4. Research methodology

Based on the literature review and the summary, Dr. Lazarov formulated as the goal of his research "to investigate the relationship between the combination of specific symptoms originating from the genitourinary system, suspicious of androgen deficiency, and the level of testosterone in men aged 35 to 45, in an attempt to determine a clear discriminatory threshold below which they become clinically significant". Four tasks were formulated that logically follow from this goal: to analyze the lifestyle and harmful habits of the participants, the level of testosterone in view of metabolic indicators, and of other hormones from the sex hormone axis in relation to seminological indicators, prostate volume, the amount of residual urine, the size of the testicles (from ultrasound examination) and the parameters of the urination sample.

The methods of the study are described on eight pages. The chosen research methodology is a cross-sectional, observational study, conducted on a sample of several thousand screened men over several years, with a final group of 73 men aged 35-45 years who met the criteria, as well as 20 corresponding healthy controls. An original questionnaire was used, modern laboratory methods - both for hormonal and seminological diagnostics, modern ultrasound and Doppler-based methodology. A modern uroflowmeter was also used. Statistical processing includes parametric and non-parametric methods that allow reliable calculations and mathematically based conclusions from the collected data. The scientific

study also complied with the ethical criteria and standards for this type of research. In conclusion, the chosen methodology is appropriate for the set goals and objectives and supports the validity of the obtained results.

5. Characteristics and evaluation of the dissertation work

The results are presented in 36 pages, and the Discussion – in 18 pages. The results are reliable and are the product of the personal activities of the doctoral student. The results of the applied questionnaire, the metabolic and anthropometric assessment, the hormonal profile (testosterone, SHBG, free testosterone, estradiol, E/T ratio, gonadotropic hormones), the microbiological and seminological assessment, the ultrasound examination of the testicles and the Doppler sonography of the penile arteries of the participants are shown very clearly, consistently and in a clear manner. The interrelationships between the individual parameters of the study are shown. The text is illustrated with 12 tables and 21 figures.

The discussion logically follows the structure of the results. Sufficient comparisons with the literary sources are cited. In summary, the author concludes that unhealthy lifestyle and obesity are the cause of erectile dysfunction, accompanied and partially caused by mild androgen deficiency with mixed genesis (pituitary and testicular). Against this background, cases of increased prostate volume, micturition disorders and increased resistance in the arteries supplying the gonads with blood are more common. All these changes are often accompanied by metabolic abnormalities (dysglycemia / dyslipidemia).

The dissertation ends with a visual diagram of the described disorders, as well as an appeal to the specialists for a holistic approach to individuals with similar complaints.

6. Contributions and significance of the work for science and practice

The dissertation contains several scientific and applied achievements. The main advantage of the present work is the complex assessment of the participants. The main contribution of the doctoral student lies in the integral, wide-ranging and in-depth clinical-laboratory-instrumental approach. Until now, such a complex and long-term assessment of a relatively young age group of men has not been done in our country. Even internationally, such studies with multiple aspects are very rare. This is the main original contribution of the dissertation. The in-depth assessment of the information provided by the estradiol/testosterone ratio in men is also a contribution. I hereby accept the contributions of the work listed by the doctoral student.

7. Assessment of the publications on the dissertation

The doctoral student has submitted 3 (three) publications in English - all three are in journals reflected in the international databases SCOPUS, Web of Science, and one of them also has an impact factor. The full-text publications fully reflect the various aspects of the dissertation, with 2 of them being oriented more towards hormonal assessment and erectile dysfunction (Acta Medica, Folia Medica), and the third - towards the relationship with prostate volume (Comptes Rendues de l'Academie Bulgare). 3 participations in scientific forums in our country have also been submitted. This meets the requirements of the Act on Academic Positions and Degrees.

8. Personal participation of the doctoral student

The presented dissertation work was created with the personal participation of the doctoral student, and the results and contributions are entirely a consequence of his personal work.

9. Abstract

The abstract covers 46 pages and in content and quality meets the requirements of the relevant regulations. It reflects the main results, listed in the dissertation, in a synthesized but sufficiently detailed manner.

CONCLUSION

The proposed dissertation work by Dr. Georgi Lazarov treats an important problem for younger men in a thorough and multidisciplinary manner. Reliable, important and relevant scientific and applied results have been obtained. The dissertation and the short abstract meet the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB) and the Regulations for the Implementation of the ADSRB.

Taking into account the work done and the results achieved, I give my positive assessment of the above-reviewed dissertation, abstract, results and contributions, and I propose to the esteemed scientific jury to award the educational and scientific degree of 'doctor' to Dr. Georgi Vladimirov Lazarov in the doctoral program in Animal and Human Physiology.

27 November 2025 Prof. Mihail Boyanov

