

To the chairman

of the Scientific Jury

МЕДИЦИНСКИ УНИВЕРСИТЕТ

ПЛОВДИВ

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REVIEW

by Prof. Dr. Adelaida Lazarova Ruseva, MD

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External member of the scientific jury for the defense of the dissertation work for the acquisition of the Doctorate in the scientific specialty "Clinical Laboratory" on the basis of order No. P-141 dated 11.01.2024 of the Rector of the Medical University of Plovdiv.

Topic: "Study of thyroid function in healthy pregnant women from the Plovdiv region and development of population-specific reference limits of thyroid-stimulating hormone for each trimester of pregnancy"

Author: Dr. Boyan Nikolaev Delev, doctoral student of self-study in the field of higher education 7. Health care and sports, by professional direction 7.1. Medicine, in the Department of "Clinical Laboratory" FM, MU Plovdiv, Scientific supervisors: Prof. Dr. Tanya Deneva, MD, Assoc.Prof. Dr. Boyan Nonchev, MD

Brief Introduction of the candidate:

Dr. Boyan Delev graduated in 1992 from the Polytechnic High School in Yambol. During the period 1996-2002, he received his higher education at the Medical University of Plovdiv. He began his work experience in 2004 as a doctor in the clinical laboratory of UMBAL "St. Georgi" Plovdiv. In 2007, Dr. Delev obtained a specialty in clinical

laboratory. Since May 2016, he has been elected as an assistant in the Department of Clinical Laboratory at MU Plovdiv. He participated in 1 intra-university research project. In connection with the dissertation work, the doctoral student has 3 journal publications, one of which is in a Scopus-referenced journal.

Relevance of the topic of the dissertation:

There is much scientific evidence that thyroid function undergoes significant changes during pregnancy. These processes are dynamic and not infrequently associated with pronounced fluctuations in the values of thyroid hormones and TSH. This increases the likelihood of misinterpretation of laboratory results and the risk of overdiagnosis of thyroid dysfunction. On the other hand, thyroid dysfunction is associated with significant risks to pregnancy and the fetus. Therefore, the correct assessment of hypo- or hyperthyroidism is essential to prevent pregnancy complications. This motivated efforts to define pregnancy-specific reference ranges for TSH for each trimester of pregnancy. In our country, there are data from individual studies, but for the Plovdiv region there are no such data. These facts are an important prerequisite for the results of this dissertation to find their important scientific and practical application.

Structure and content of the dissertation:

The dissertation is presented on 114 pages with an optimal ratio between the individual parts: introduction, literature review, aim and objectives, material and methods, results, discussion, conclusions and contributions. The results are presented in 13 tables, 11 histograms and 4 figures. The bibliography includes 263 titles, of which 5 are in Cyrillic.

The literature review is detailed and comprehensive, structured well and presented in a volume of 32 pages. The physiological processes determining the dynamics of TSH and thyroid hormones during pregnancy, the possibility of specific complications, and the problem of

overdiagnosis are presented in depth and in a logical sequence. Emphasis is placed on the need for laboratory evaluation of thyroid function to be performed on the basis of population-based trimester-specific reference limits as the optimal approach, citing the considerable amount of scientific research.

The purpose of the dissertation is clearly formulated on the basis of the detailed review of the literature on the problem and the logical conclusions derived from the literature review, namely: "To study the functional, morphological and immunological characteristics of the thyroid gland in healthy pregnant women and to develop a population-specific reference intervals of TSH and FT4 for the different stages of pregnancy". 4 tasks have been formulated, necessary and sufficient for the implementation of the set goal.

In the "**Materials and methods**" section, data on: the design of the scientific study, criteria for selecting the group of healthy individuals, the criteria for inclusion and exclusion of the target group are presented with extreme precision; requirements for the biological material, a sufficiently detailed description of the laboratory research methods. The software products "IBM SPSS 26" and "REFVAL Program" were used for statistical processing of the obtained results.

In connection with the realization of the set goal, the doctoral student presents the **results** of his work in 4 sections, referring to the solution of the set 4 tasks.

The results of the dissertation work are **discussed** in detail on the basis of existing data indicated in the literature review. Comparable with other studies, the results of the dissertation work were obtained in terms of the frequency of spontaneous pregnancy loss, of difficulty in conceiving, of familiarity with regard to thyroid pathology, of the percentage of

pregnant women who were active smokers, which in this study was 22.38 %.

The analysis of the measured concentrations of TSH in the monitored group of pregnant women shows that in the first trimester in some of them, the value is below the lower reference limit, with a reference interval of 0.34 - 5.6 mIU/l used so far for the entire period of pregnancy. The differences in fT4 results from this study also strongly suggest the need to define population reference limits. Regarding the thyroid volumes, there was no excess of the accepted norms in any trimester, but there was a slight increase in all observed parameters in the second and third trimesters compared to the first.

As a result of the research and analysis, 6 important **conclusions** of great practical value were made. Of particular importance are two of them concerning newly established reference intervals for fT4 and TSH in pregnant women for the first three trimesters of pregnancy.

Based on the conclusions of the dissertation, the doctoral student formulated 6 **contributions**, mainly of a practical and applied nature. Overall, the study provides valuable data on the physiological changes in the thyroid gland during pregnancy in women from the study population. Evaluation of parameters of thyroid function, morphology and autoimmunity provides important information for the diagnosis of functional thyroid disorders and the need for therapy and follow-up of affected women. The establishment of population trimester-specific reference limits lowers the possibility of misinterpretation of laboratory results associated with significant risks to the pregnancy and the fetus.

The presented **abstract** is written on 48 pages, prepared according to generally accepted rules. It contains identical figures,

histograms and tables and reflects the results, conclusions and contributions presented in the dissertation.

In connection with the dissertation work, the doctoral student presents 3 publications in scientific journals: 1 in „General Medicine“ and 2 in „Knowledge – International Journal“. He is the first author in all three publications. 2 participations in scientific forums in 2021 and 2022 are also indicated.

In conclusion:

I firmly believe that with this work, Dr. Boyan Nikolov Delev proves that he possesses the necessary qualities to acquire the educational and scientific degree "doctor". The dissertation in terms of volume, content and relevance meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria.

This gives me the reason to give a POSITIVE REVIEW for the dissertation on the topic: "Study of thyroid function in healthy pregnant women from the Plovdiv region and development of population-specific reference limits of thyroid-stimulating hormone for each trimester of pregnancy" for the award of an educational and scientific degree "Doctor" in the scientific specialty "Clinical Laboratory".

February 01, 2024

Prof. Dr. A. Rusev



Заличено на основание
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