

Review

of the dissertation: "Assessment of oxidative stress and early vascular damage in children and young adults with Beta-thalassemia major", presented for public defense in front of a scientific jury for awarding the educational and scientific degree "Doctor of Medicine", professional direction 7.1 Medicine, scientific specialty "Pediatrics"

Author of the dissertation: Dr. Kristina Ivaylova Petrova, assistant in the Department of Pediatrics at the Medical University of Varna; PhD candidate in the Pediatrics program.

**Reviewer: Prof. Dr. Zhaneta Georgieva Tyaneva, PhD, MU Varna member of the Scientific Jury, approved by order of the Rector of Medical University of Varna,
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Biographical data:

Dr. Petrova was born on March 7, 1988. In 2013 she graduated from Medical university of Varna. In 2019, she acquired a specialty in Pediatric Clinical Hematology and Oncology. Since 2019, she has been an assistant at the Department of Pediatrics at Medical university of Varna. In 2020 she was enrolled in the doctoral program "Pediatrics".

Dissertation: "Assessment of oxidative stress and early vascular damage in children and young adults with Beta-thalassemia major"

The purpose of the dissertation is precisely formulated. The PhD student aims to assess and identify the presence of early vascular damage by studying arterial stiffness of peripheral vessels and to investigate its correlations with some markers of oxidative stress, lipid profile markers and lipid indices in children and young adults with beta-thalassemia major (BTM). The monitoring of vascular health, the clinical manifestations of early vascular changes and the prediction of their

therapeutic impact in BTM are the main aims of this study and they have been clearly formulated and strictly performed.

The dissertation has a standard structure of 137 pages and is illustrated with 36 tables and 21 figures. The bibliographic reference contains 358 titles, 21 of which are in Cyrillic and 337 are in Latin.

The literature review is written in depth and shows a detailed knowledge of the literary sources and a competent attitude to the data published so far on the problem.

The results are convincing and precise. They have a scientific value and a contributing character. In the presented dissertation, patients with BTM show significant differences in lipid profile markers and significantly higher values of atherogenic lipid indices. Regarding the echo-tracking parameters, patients with BTM have significantly higher values of arterial compliance and reliable positive correlation of serum ferritin levels with some of the lipid profile markers. The significant positive correlation of hemoglobin values with lipid profile markers is impressive, as well as the significant correlation between some echo-tracking (ET) parameters for arterial stiffness of the two carotid arteries with age, gender, lipid profile markers and atherogenic lipid indices.

I agree with the conclusions drawn and the reference for the dissertation's contributions. For the first time in Bulgaria, a PhD student studies the control of vascular health in patients with BTM. The study of the vascular status in BTM enables comparative analyzes and detection of early vascular changes, as well as the definition of possibilities for therapeutic influence. The dissertation is the first one to evaluate the lipid profile markers and lipid indices in patients with BTM and their relationship with parameters of iron overload, oxidative stress and arterial stiffness. The evaluation of arterial stiffness of carotid arteries using echo-tracking methodology in BTM patients is done for the first time in Bulgaria.

I accept the contributions of the author as original. The calculation of lipid indices is considered as a possible tool for cardiovascular risk assessment in patients with BTM, as well as the sonographical determination of carotid artery stiffness as an affordable, non-invasive method to assess vascular health. I support the PhD

student's proposal to include these methods in the follow-up algorithm for BTM patients, as well as recording subclinical vascular damage as a potential approach for screening and prevention of cardiovascular complications in BTM patients.

Contributions of a scientific and practical nature, as well as those of a confirmatory nature, are of essential importance for the dissertation work. In children and young adults with BTM, the changes in the lipid profile and lipid indices observed by the author are characteristic. The registered positive correlation between lipid indices and arterial stiffness indicators is significant, as is the correlation of splenectomy in those patients with more severe dyslipidemia and arterial stiffness.

The improved disease control and increased life expectancy in patients with BTM undoubtedly affects the progressive increase in the risk of atherosclerosis and cardiovascular diseases. Based on this issue, Dr. Petrova's dissertation work is up-to-date and provides an opportunity to monitor vascular health, the clinical manifestations of early vascular changes and their therapeutic impact.

The comparative analyzes of patients with BTM provide an opportunity to refine the vascular damage and predict the risk. Lipid profiles, resp. indices, and changes in carotid artery elasticity and stiffness have proven to be effective approaches for cardiovascular risk stratification. The established correlations are a potential substrate for risk-based algorithms for follow-up and selection of drug preventions. Dr. Petrova has 3 full-text publications on the dissertation work and 2 participations in scientific forums.

Conclusion:

The presented dissertation of Dr. Petrova is a confirmation of her creative and research potential. It covers all scientometric criteria for awarding the scientific and educational degree "Doctor" according to the Medical University of Varna and the Regulations of the Medical University of Varna. The dissertation is contemporary. I believe that she would make original and confirmatory contributions. I give a positive vote for awarding the scientific degree "doctor" of Dr. Kristina Ivaylova Petrova.

29.05.2024
Varna

Reiviewer:
Prof. Dr. Zhaneta Georgieva Ivanova

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