**OPINION**

**By Prof. Dr. Dobrin Iotkov Vassilev, PhD**

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**Medical Director of CHATC "Medica Kor", Ruse**

Regarding a dissertation thesis for the acquisition of the educational and scientific degree "PhD" in the field of higher education 7. Health care and sports, professional direction 7.1. Medicine, PhD program "Angiology".

Topic: „ATHEROSCLEROSIS OF CAROTID, CORONARY AND PERIPHERAL ARTERIES IN PATIENTS WITH DEGENERATIVE AORTIC STENOSIS"

Author: Dr. Desislava Bojidarova Bojadgieva-Marincheva

Form of doctoral studies: Independent preparation

Scientific unit: Clinic of angiology

Research supervisor: Prof. Dr. Milena Staneva Staneva, PhD.

Prof. Dr. Sotir Todorov Marchev, DSc

## 1. General presentation of the procedure and the doctoral student

When writing the dissertation, requirements for the procedure in terms of dissertation ability, choice of topic, internal defense, and selection of a Scientific Jury were observed. The dissertation paper was discussed and proposed for defense by an extended Scientific Collegium of Angiology Clinic at Acibadem City Clinic UMHAT Tokuda. At a meeting of the Scientific Council of "Acibadem City Clinic UMHAT Tokuda" EAD (Protocol № 49/01.11.2023 г.) and by order № 15-01-516/24.11.2023 of the Executive Director and the Procurator of the hospital, I am appointed as an external member of The scientific jury in connection with the dissertation paper of Dr. Desislava Bojadgieva. I am determined to submit an Opinion.

No plagiarism was detected from the submitted reference Metadata StrikePlagiarism.com.

I declare that I have no conflict of interest with the author of the dissertation.

Dr. Desislava Bojagieva was born on 03.09.1978 in Pleven. In 1997 she graduated the Foreign Languages High School in Pleven. In 2003 she graduated in medicine at

the University of Medical Sciences in Pleven. From 2008 to 2012 she was a specialist and assistant professor in Cardiology at the University Hospital "Dr. Georgi Stranski" in Pleven. In 2012 she acquired a specialty in Cardiology. From 2017 to 2020 she specializes Angiology at Acibadem City Clinic MHAT Tokuda, Sofia and in December 2020 she acquired a specialty in Angiology. In 2019 she obtained a certificate for HSW "Ultrasound Vascular Diagnostics" from MU - Sofia. From 2017 to 2020 she worked at the Heart and Brain Hospital in Pleven as an angiologist and cardiologist at the Vascular Surgery Clinic. From 2020 to the present, she has worked in an ambulatory practice.

She is a member of the Bulgarian Society of Angiology and the Society of cardiologists in Bulgaria

**2. Topical relevance**

Degenerative aortic stenosis is the most common valvular disease in adults in industrialized countries, and atherosclerosis is the most common vascular disease. Both diseases have a high incidence of morbidity and mortality and lead to high healthcare costs. Many researchers are looking for similarities between the two diseases and the mechanisms that cause them, with the aim of improving their prevention and treatment. The present dissertation attempts to answer some unresolved and controversial questions about the relationship between aortic stenosis and atherosclerosis and this makes it extremely relevant.

**3. Knowledge of the problem**

The PhD student knows the state of the problem and evaluates the literature creatively.

**4. Methodology of the study**

The chosen research methodology allows achieving the set goal and obtaining an adequate answer to the problems solved in the dissertation.

**5. Characteristics and evaluation of the thesis and contributions**

The dissertation of Dr. Bojadgieva is written in 117 pages, illustrated with 20 figures and 59 tables. It is properly structured and includes 9 sections:

Abbreviations and symbols used - 1 page;

1. Introduction - 1 page;
2. Literature review - 26 pages;
3. Aim and objectives - 1 page;
4. Material and Methods - 11 pages;
5. Own results - 41 pages;
6. Discussion - 11 pages;
7. Conclusion - 1 page
8. Inferences - 1 page;
9. Bibliography - 19 pages; The bibliography contains 182 references, of which 3 in Cyrillic and 179 in Latin.

**In the introduction** the problem is well formulated and the aim of the thesis is justified.

The **literature review** is competently written and demonstrates a good knowledge of the problem at hand in its various aspects. The underlying mechanisms and risk factors for degenerative aortic stenosis are well reviewed, as are its similarities with atherosclerosis of different localization.

The **aim** of the thesis is well formulated in line with the thesis topic and the literature review presented. The aim of this work is to evaluate the presence and severity of atherosclerosis of carotid, coronary and peripheral arteries in patients with degenerative aortic stenosis in order to develop an algorithm for management for prevention and improved prognosis.

The set **tasks**, 6 in total, are quite sufficient and are fully realized in the dissertation.

In the section **"Materials and methods"** are described in detail the 132 patients, men and women, aged from 48 to 92 years, studied in the period 2018 - 2019. The studied patients are divided into two main groups: Group I - Patients with aortic stenosis - 91 (average age 73 years), divided into 3 subgroups: 1. High grade AS - 46 patients 2.Mid-stage AS- 16 patients 3. Low-grade AC - 29 patients; Group II - control - 41 patients (mean age 72 years) - patients with risk factors and clinical manifestation of atherosclerosis but without congenital or acquired aortic malformation. The study was prospective for the period indicated, and an analysis of mortality among the patients studied was performed after the second year of its completion.

For the statistical processing of the data appropriate methods and specialized statistical package SPSS (Statistical Package for the Social Sciences) version 16.0 were used, which guarantees the reliability of the results obtained.

**Results and Discussion:** The results presented are convincing and clear, the data are analysed and compared, where possible, with other publications on the subject.

**Conclusions and contributions:** based on the results obtained, Dr. Bojadgieva logically draws 9 conclusions, which correspond to the set tasks. 1. The most common clinical manifestation of atherosclerosis is in patients with mild aortic stenosis. 2. Patients with a more severe form of aortic stenosis have a smaller number of arterial pools affected by atherosclerosis compared with patients with mild aortic stenosis. 3. Patients with mild aortic stenosis were found to have more severe coronary pathology and fewer realized myocardial infarctions, and those with high-grade aortic stenosis, milder coronary pathology with more realized coronary events. 4. There was no statistically significant association between the presence of a specific risk factor and aortic stenosis. 5. Risk factors for atherosclerosis are similar to those for aortic stenosis, but have no relationship to disease progression and the degree of valvular stenosis. 7. High-grade AS is protective for MSDs - the presence of severe AS reduces the risk of developing MSDs by 2.9 times.8. Patients with AS resemble patients with atherosclerotic disease in their involvement of the abdominal aorta. 9. Despite identical

conditions and risk factors for the occurrence, we have two different pathways of development of the pathological condition: to AS or to atherosclerotic vascular disease

The contributions are 6 original, scientifically applied.

**6.The abstract** reflects what is written in the thesis. In accordance with the academic requirements, the contributions are presented and a list of publications related to the dissertation is attached.

**7. Assessment of publications and personal contribution of the PhD student**

The PhD student presented two publications and 7 participations in national and international congresses related to the dissertation, with 2 abstracts published in IF journals. This activity meets the national minimum requirements for the educational and scientific degree "PhD".

**CONCLUSION**

The dissertation contains scientific-theoretical and applied results that represent an original contribution to science, expanding our knowledge in the field of multifocal atherosclerosis, cardiology and angiology. It is written in a strictly scientific style. It complies with all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of LDASRB and the Regulations of "Acibadem City Clinic UMHAT Tokuda" EAD. The submitted materials and dissertation results fully comply with the specific requirements adopted in connection with the Regulations of "Acibadem City Clinic UMHAT Tokuda" EAD for the implementation of the LDASRB

Dr. Desislava Bojadgieva is a specialist in cardiology with 11 years of experience and in angiology with 3 years of experience. The PhD student demonstrates the qualities and skills to conduct scientific research independently.

**Due to the above, I give my positive assessment and strongly recommend to the members of the Scientific Jury to *positively* evaluate the dissertation work "Atherosclerosis of carotid, coronary and peripheral vessels in patients with degenerative aortic stenosis" and to award Dr. Desislava Bojidarova Bojadgieva - Marincheva Scientific and educational degree "PhD" in the field of Higher Education 7. Health care and sports, professional direction 7.1. Medicine, doctoral program "Angiology".**

07.01.2024

City of Sofia

Prepared the opinion:

Prof. Dr Dobrin Vasilev, PhD