

## **REVIEW**

**By Prof. Dr. Ivan Tomov Gruev, PhD.**

**Deputy Director of Medical Activities, NMTH "Tsar Boris III"**

**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**

In connection with the work submitted to me for opinion, I declare that I have no conflict of interest. No plagiarism detected from the submitted reference Metadata StrikePlagiarism.com.

Dr Bojadgieva completed the individual doctoral plan and successfully passed the doctoral minimum exam. The dissertation thesis was discussed and proposed for public defense by the extended Scientific Collegium of the Angiology Clinic at Acibadem City Clinic UMHAT Tokuda. At a meeting of the Scientific Council (Protocol 49/01.11.2023), she was dismissed with the right of defense. By order No. 15-01-516#1/24.11.2023 of the Executive Director and Procurator of the hospital, I am appointed as an external member of the Scientific Jury. I am determined to submit a Review.

D-r Desislava Bojidarova Bojadgieva-Marincheva graduated in medicine at the Medical University, Pleven in 2011. She has worked at UMHAT "D-r Georgi Stranski" – Pleven as assistant in cardiology (01.12.2005 – 31.12.2015), at DCC -1 Pleven

(01.01.2012-23.12.2014), at SHATK Pleven (01.01.2015-01.05.2017), at Heart and Brain Hospital in Pleven (01.05.2017-15.08.2020), at DCC-Avis Medica Pleven (16.08.2020 – 19.06.2023) and Medical Center CITYMED Pleven (19.06.2023 to present) as a cardiologist and angiologist. She acquired specialty in "Cardiology" in 2012 from MU Pleven and a specialty in "Angiology" in 2020 from MU Sofia.

## **2. Relevance of the topic**

Degenerative aortic stenosis (DAS) is the most common valvular disease in adults in industrialized countries, and atherosclerosis is the most common vascular disease. Both are socially significant diseases and lead to high healthcare costs. Atherosclerosis and AS have similar histological signs and risk factors for their appearance, but different mechanisms for the progression of the pathological process. Risk factors for atherosclerosis are better defined than those for the development of AS, and prevention focuses specifically on reducing their impact on the individual. However, knowledge of the pathogenesis of the both conditions, has not led to a complete prevention of the development of these diseases. Dr. Marincheva's dissertation work aims to contribute solving the unclear and controversial questions that concern the similarities and differences between atherosclerosis and DAS.

## **3. Characterization and evaluation of the dissertation work and contributions**

The dissertation is presented on 113 pages, contains 21 figures and 59 tables. The bibliography includes 182 literary sources: 3 by Bulgarian authors and 179 by foreign authors.

**The *literature review*** shows a good knowledge of the problem under consideration in its various aspects.

**The *aim*** of the dissertation work is clear and specific: to assess the presence and severity of atherosclerosis of carotid, coronary and peripheral arteries in patients with degenerative aortic stenosis in order to build a behavior algorithm for prevention and improvement the prognosis of patients with DAS.

There are 6 ***tasks***, well formulated and accurately reflecting the purpose of the study:

1. To determine which localization of atherosclerosis is more often associated with degenerative aortic stenosis.
2. To establish what is the relative weight of RF for atherosclerosis for the development of DAS.
3. How the presence of AS affects mortality.
4. To establish whether there is a relationship between the severity of the atherosclerotic process and the degree of AS.
5. To answer the question, do all patients with AS need to be actively investigated for the presence of peripheral, coronary and carotid atherosclerosis
6. To compile an algorithm for behavior in patients with DAS in order to provide a better prevention and improvement of the prognosis.

**Material and methods.** In the present prospective study, patients with degenerative aortic stenosis (men and women) treated in the Clinic of Cardiology and Clinic of Vascular Surgery of the "Heart and Brain" Medical Center Pleven in the period September 2018 - September 2019 are included. They were compared with a control group - patients with risk factors and clinical manifestations of atherosclerosis, without aortic stenosis, similar in age and sex, who are the main RF opacifiers.

In addition to a detailed medical history, status and laboratory assessment, the patients also underwent a precise ultrasound diagnosis of the heart and vessels.

The statistical methods are modern and adequate to the set goals and tasks.

The **results** present in detail the risk factors for atherosclerosis and AS, the involvement of different vascular territories by the atherosclerotic process, and the determinants of mortality in the study population.

**The conclusions** are well-founded and correspond to the tasks set and the results obtained.

1 The most common clinical manifestations of atherosclerosis have the patients with mild aortic stenosis.

2. Patients with a more severe form of aortic stenosis have a smaller number of arterial basins affected by atherosclerosis compared to patients with low grade aortic stenosis.

3. In patients with mild aortic stenosis, we find more severe coronary pathology and fewer realized myocardial infarctions, and in those with high-grade aortic stenosis, milder coronary pathology with more realized coronary incidents.

4. No statistically significant relationship was found between the presence of a specific risk factor and aortic stenosis.

5. Risk factors for atherosclerosis are similar to those for aortic stenosis, but are unrelated to disease progression and degree of valve stenosis.

6. The number of risk factors in patients with aortic stenosis did not change the mean number of arterial basins affected by atherosclerosis.

7. High-grade AS is protective with regard to brain vessel disease – the presence of severe AS reduces the risk of brain vessel disease development by 2.9 times.

8. Patients with AS are similar to patients with atherosclerotic disease in the involvement of the abdominal aorta.

9. Despite the same conditions and risk factors for occurrence, we have two different paths of development of the pathological condition: to AS or to atherosclerotic vascular disease.

#### ***Original contributions of a scientific and applied nature***

1. For the first time in Bulgaria, a detailed assessment of the relationship between aortic stenosis and atherosclerosis was made.

2. An algorithm for behavior in patients affected by atherosclerosis and aortic stenosis was developed.

3. A telephone interview was used to check the current status of patients, which is a convenient and safe method in pandemic conditions.

4. The results of the present work clarify that, although not completely mutually exclusive, degenerative aortic stenosis and atherosclerosis of the coronary and carotid arteries are largely opposite conditions. Ultrasound evaluation of the vessels should not be used as a screening method for aortic stenosis.

5. With known atherosclerotic disease of the aorta, it is appropriate to look for aortic valve stenosis, and also vice versa: with known aortic stenosis, the condition of the aorta should also be checked.

6. In compiling this paper, a large amount of data has been collected and processed that can serve as a starting point for further research on the problem.

In connection with her PhD thesis, the PhD student presented two publications and 6 participations in congresses.

*I especially appreciate the created practical model for behavior in patients with AS.*

4. The **abstract** meets the requirements and fully reflects the results presented in the dissertation thesis.

#### **5. Assessment of the publications and personal contribution of the doctoral student**

In connection with the doctoral thesis, the doctoral student presents two publications and 7 participations in national and international congresses, of which 2 abstracts were published in a journal with IF. They exceed the national minimum requirements for the educational and scientific degree "PhD".

### **CONCLUSION:**

The dissertation thesis of dr. Desislava Bojidarova Bojadgieva-Marincheva is a thorough study of aortic stenosis and atherosclerosis in different vascular territories. In the course of the presentation, the PhD student shows a thorough knowledge of the scientific literature, as well as excellent abilities to collect, analyze and summarize the obtained results. It meets 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 for awarding the educational and scientific degree "PhD".

Therefore, I recommend the distinguished members of the scientific jury to vote positively for the award 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" to the Dissertation of dr Desislava Bojidarova Bojadgieva-Marincheva.**

19.12.2023

Sofia

Prepared the review

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