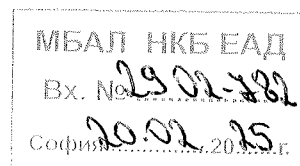


REVIEW



By Assoc. Prof. Dr. Petar Atanasov Shivachev MD.

University Hospital "St. Marina" EAD-Varna, member of the scientific jury, appointed by order No. 447/30.10.2024 of Dr. Krasimir Dzinsov, executive director of University Hospital "NCB" EAD-Sofia, in a competition for the academic position of "associate professor", in the scientific specialty "Pediatric Cardiology", for the needs of the Clinic of Pediatric Cardiology, at University Hospital "NCB" EAD-Sofia, announced in the State Gazette No. 91/29.10.2024.

The current review has been prepared following the Law on the Development of the Academic Staff of the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of the Law on the Development of the Academic Staff (PPZRAS) and the Regulations on the Conditions and Procedure for Acquiring Scientific Degrees and Titles and Holding Academic Positions at the National Cardiac Hospital "NCB" EAD-Sofia.

The competition and the procedure for its conduct follow Law on the Competition and the Competition of the Republic of Bulgaria, the Law on the Competition and the Competition of the Republic of Bulgaria and the Regulations on the terms and conditions for acquiring scientific degrees and titles and holding academic positions at the National Cardiac Hospital EAD-Sofia. I have no conflict of interest caused by my participation in the current scientific jury.

In the competition, regular documents were submitted to a single candidate, Dr Zornitsa Nikolova Vasileva-Enikova, MD.

Professional Development

Dr Zornitsa Vasileva was born on 17.12.1980. She completed her secondary education at the American College of Sofia. She graduated from the Faculty of Medicine of the Medical University of Sofia in 2005 with honours (diploma No. 018713/15.11.2005). During 2006-2011, she specialized in Paediatrics at the Department of Paediatrics, Sofia. Under the supervision of Assoc. Prof. Snezhinka Tomova is also trained in paediatric echocardiography and fetal echocardiography. In 2007, after successfully passing a competition, Dr. Vasileva was appointed as an assistant professor in Paediatrics at the Faculty of Medicine of the Medical University of Sofia. She specialized in Paediatrics in 2011 (diploma No. 016035/17.06.2011). In the same year, she was enrolled in a specialization in Paediatric Cardiology at the Paediatric Cardiology Clinic of the National Cardiology Hospital - Sofia, after successfully passing an exam. She obtained a speciality in Paediatric Cardiology in 2017 (diploma No.

015614/02.02.2017). During 2012-2018, he worked as a paediatrician in Belgium, and from May 2014 to April 2016, she specialized in Paediatric Cardiology at the University Hospital of Ghent, Belgium. In August 2016, she acquired the European Certificate "Echocardiography in Congenital Heart Disease" (European Association of Cardiovascular Imaging certification in Congenital Heart Disease Echocardiography), and in March 2018, the certificate "Advanced fetal echocardiography" from the University of Barcelona, Spain. In 2015-2018, she was a consultant physician in pediatric cardiology at the Specialized Children's Hospital "Queen Paula" in Antwerp, Belgium and the Clinic of Pediatrics of the University Hospital of Ghent, Belgium.

Since February 2019, Dr Vasileva has been working as a paediatric cardiologist at the Paediatric Cardiology Clinic of the National Cardiac Hospital, Sofia, and a little later, she was appointed as a part-time lecturer at the Medical University - Sofia. In March 2019, she obtained a certificate in "Echocardiography in childhood, fundamental level, transthoracic echocardiography (1R EchoCG, 2R EchoCG), pulse, continuous and colour Doppler", and in December 2021 - a certificate in "Fetal Echocardiography" from the Medical University, Sofia. In February 2022, she received a certificate of professional qualification in Health Management from the Academy of Economics, Svishtov (reg. No. 2022001/10.02.2022). In June 2024, she specialized in fetal echocardiography at the Center for Prenatal Diagnostics in Warsaw, Poland.

In 2020, she was enrolled as a doctoral student in independent training at the Clinic of Pediatric Cardiology with scientific supervisor Prof. Anna Kaneva, successfully defending her doctoral thesis on the topic "Preoperative echocardiographic diagnosis of complete atrioventricular septal defect" in February 2023 (diploma No. 20/14.02.2023). Since the same year, she has been a chief assistant at the clinic and participates in the training of medical students, and residents in paediatrics and paediatric cardiology. She is a lecturer in an ultrasound training course for neonatologists and residents in cardiology. She is a scientific supervisor of two residents in pediatric cardiology.

Dr Vasileva has a total of 88 full-text publications, most of which she is the first author. Of these, 25 are in publications indexed and referenced in world databases (8 with IF); 21 are in publications from the National Reference List and 42 – in other publications. 5 abstracts have been published in publications with IF and 2 abstracts in publications indexed and referenced in world databases. She has participated in several training courses and congresses in pediatric cardiology and lectured at 20 national congresses in paediatric diseases, cardiology, cardiac surgery, neonatology, obstetrics and gynaecology. From 2010 to 2023, Dr. Vasileva is an editor in the specialized medical publications MD and CardioD.

Dr Zornitsa Vasileva is fluent in English and Dutch – written and spoken, and has basic knowledge of French, German and Russian. She has computer skills in Microsoft Office, Internet and medical databases.

Dr Vasileva is a consultant to the Bulgarian Christmas and a reviewer for the journals Hippokratia BMC and Paediatrics. She also participates in seminars of the Children's Heart Association.

She participates actively as a researcher in two scientific projects: MEDLEY - clinical study (2019 – 2023). A Phase 2/3 Randomized, Double-blind, Palivizumab-controlled Study to Evaluate the Safety of MEDI8897, a Monoclonal Antibody With an Extended Half-life Against Respiratory Syncytial Virus, in High-risk Children and NPCarriage Study - clinical study (2016-2019). Streptococcus pneumoniae serotypes carried by young children and their association with Acute Otitis Media during the period 2016 – 2019.

Dr Vasileva was awarded by the Society of Cardiologists in Bulgaria for the publication "Echocardiographic parameters for differentiating balanced from unbalanced forms of complete atrioventricular septal defect" Z. Vasileva, A. Kaneva.

Member of the Bulgarian Medical Association (BMA), the Bulgarian Pediatric Association (BPA), the Society of Cardiologists in Bulgaria, the European Association of Pediatric Cardiology (AEPC), the European Association of Cardiovascular Imaging (EACVI), the European Society of Cardiology (ESC), the Fetal Heart Society and the Orde der Geneesheren – Flemish Medical Association, Belgium.

Teaching and learning activities

Dr Vasileva actively participates in the teaching and learning activities of students, interns and residents in paediatrics and pediatric cardiology. In 2007, after successfully passing a competition, she was appointed as an assistant in Pediatrics at the Faculty of Medicine of the Medical University of Sofia and conducts practical and thematic classes for medical students (Bulgarian and English-speaking). Since February 2019, Dr Vasileva has been working as a pediatric cardiologist at the Pediatric Cardiology Clinic of the National Cardiology Hospital - Sofia and soon after was appointed as a part-time lecturer at the Medical University - Sofia. Since September 2023, she has been a chief assistant at the clinic and participates in the training of medical students (Bulgarian and English-speaking), and residents in paediatrics and paediatric cardiology. She is a lecturer in an ultrasound training course for neonatologists - "Echocardiography in Neonatology", as well as for residents in cardiology. She is a scientific supervisor of two residents in pediatric cardiology.

Research activity

For the competition, Dr Vasileva presented a dissertation on the topic "Preoperative echocardiographic diagnosis of complete atrioventricular septal defect" and a monograph - "Atrioventricular septal defect - embryology, prenatal diagnosis, hemodynamics, anatomical characteristics, natural and postoperative evolution, echocardiographic evaluation". She has a total of 88 full-text

publications, in most of which she is the first author, distributed as follows: 25 are in publications indexed and referenced in world databases (8 with impact factor); 21 are in publications from the National Reference List and 42 – in other publications. 5 abstracts have been published in publications with impact factor and 2 abstracts in publications indexed and referenced in world databases. She has participated in numerous training courses and congresses in paediatric cardiology – mostly international ones and has lectured at 20 national congresses in paediatric diseases, cardiology, cardiac surgery, neonatology, obstetrics and gynaecology.

Dr Vasileva's scientific interests are in various areas, mainly in pediatric cardiology: congenital heart malformations (CHM) - anatomical characteristics and hemodynamics, echocardiographic diagnosis; fetal cardiology; cardiac involvement in the context of COVID-19 in children; infectious endocarditis in childhood; pediatric cardiac surgery and intensive care medicine. Scientific interests also extend to other areas of medicine - rare clinical cases, general paediatrics, cardiology, endocrinology.

The main scientific interests can be divided into the following areas:

- **Congenital heart malformations.** A major point in Dr Vasileva's scientific works is occupied by congenital heart malformations (CHM), with *atrioventricular septal defects (AVSD)* being an area of particular interest. Various aspects of AVSD have been reviewed in several scientific publications, both individually and in a collective (№10, 24, 42, 43, 44, aД1-Д3). Two of the papers were presented as posters at the annual meetings of the European Society of Pediatric Cardiology (AEPC), respectively in 2021 in Gothenburg, Sweden and 2023 in Dublin, Ireland. The author's dissertation work "Echocardiographic preoperative evaluation of patients with complete atrioventricular septal defect", as well as the subsequent habilitation monograph - Atrioventricular septal defect - embryology, prenatal diagnosis, hemodynamics, anatomical characteristics, natural and postoperative evolution, echocardiographic evaluation. "Arbilis" Ltd., Sofia, Bulgaria, 2024. ISBN: 978-619-7063-77-6 (Print), 978-619-7063-78-3 (e-Book), are also dedicated to the ABCD. The mentioned scientific works are distinguished by a number of scientific and theoretical contributions: For the first time in Bulgaria, a systematic analysis of patients with AVSD was carried out; the embryology, genetics, anatomical features, clinical manifestations and evolutionary complications of these defects were examined; criteria for prenatal diagnosis of AVSD were presented; detailed echocardiographic measurements of a number of parameters were performed in order to distinguish balanced from unbalanced forms; preoperative and postoperative echocardiographic evaluation of patients with AVSD was performed; the correlation between the echocardiographically determined form of the defect, the intraoperative finding, the surgical strategy used and the clinical outcome for the patient was analyzed; a comprehensive therapeutic approach for patients with AVSD was presented, including drug treatment and various types of palliative and corrective surgeries;

recommendations for behavior in adults with AVSD, as well as during pregnancy, were given. The scientific and practical contributions are: the author's own experience with patients with AVSD and the main echocardiographic features of the malformation are presented, with her images, before and after surgical intervention; it is confirmed that the correct determination of the shape of the defect (balanced or unbalanced) is of important importance for the selection of an appropriate therapeutic strategy; the created scoring system for determining the shape of the defect, based on four echocardiographic parameters, is of original character and its sensitivity and specificity have been analyzed.

In many publications, Dr Vasileva presents the anatomical characteristics, hemodynamics and diagnostic approach in various **other CHDs**: tetralogy of Fallot (No. 36, 56); most common cardiopathies in trisomy 21 (No. 39); indications for intracardiac examination in children with CHD (No. 59); indications for performing nuclear magnetic resonance (No. 79); principles of segmental analysis in echocardiography (No. 40); differential diagnostic approach in newborns with cyanosis (No. 20). These publications can be used as a practical guide by general practitioners, neonatologists, paediatricians, paediatric cardiologists and adult cardiologists involved in echocardiography. Congenital heart malformations in adults are another area of interest of the author, and several publications are devoted to them (No. 31, 41, 69), which summarize the guidelines of the European Society of Cardiology for the behaviour of adults with different types of CHD.

- **Fetal cardiology.** Fetal cardiology and prenatal diagnosis of congenital heart malformations are covered in several articles (No. 8, 13, 37, 45, 88). Her work analyzing the percentage of prenatally diagnosed cases in urgently hospitalized newborns with critical CHD was presented at the Annual Meeting of the European Society of Pediatric Cardiology (AEPC) in 2022 in Geneva. The theoretical-methodological and scientific-practical contributions are related to: the presentation of recommendations for conducting fetal echocardiography (indications, possibilities and limitations) and the benefits of the study; for the first time in Bulgaria, data on 194 urgently hospitalized newborns with critical cardiopathies were processed, which show a suboptimal frequency of prenatal diagnosis in Bulgaria (below 20%), compared to an average of 60% for developed countries, with no increase in the number of cases over 5 years. It is pointed out that one of the main problems with prenatal diagnosis is the limited access to qualified specialists, concentrated mainly in Sofia, and the need to cover a larger number of pregnant women through fetal echocardiography.

- **Cardiological involvement in children with COVID-19.** A series of articles are dedicated to the cardiac involvement within the framework of COVID-19 and the multisystem inflammatory syndrome in children – MIS-C (№14, 16, 30, 34, 46). The scientific and theoretical contributions include the presentation of the world experience and definitions for MIS-C, the pathophysiological mechanisms, the cardiac involvement, the clinical picture, the

diagnostic approach and recommendations for treatment and follow-up. The scientific and practical contributions are the publication of our own experience in a group of patients with MIS-C, analyzing demographic indicators (gender, age), clinical symptoms, laboratory constellations, ECG abnormalities and imaging results. The rapid clinical improvement after immunomodulatory therapy with intravenous immunoglobulins and the need for long-term follow-up of patients with MRI are emphasized.

- **Infective endocarditis (IE) in childhood.** Infective endocarditis (IE) is a rare disease, which is, however, associated with significant morbidity and mortality. The majority of affected patients have underlying CHD (corrected or native). In a retrospective study (№21), for the first time in Bulgaria, the data of 20 patients with infective endocarditis were analyzed and the factors that influence the outcome of surgical treatment in these patients were assessed. The analysis of gender distribution, the most common CHD complicated by IE, the most common causes, the leading clinical symptoms and laboratory markers of inflammatory activity is of scientific and practical interest. In 40% of cases, a late diagnosis was established (>30 days after the onset of symptoms), with 60% of these patients receiving prior antibiotic therapy. In 60% of cases, surgical treatment was required and in 58%, valve prosthesis was required. Fatal outcome occurred in 15% of children, all of whom received empirical antibiotic therapy. The authors concluded that the main factors adversely affecting clinical outcomes were delayed diagnosis and delayed surgical treatment.

- **Pediatric cardiac surgery and intensive care in CHD.** Several publications are in the field of paediatric cardiac surgery and the follow-up of children before and after cardiac surgeries (No. 7, 22, 23, 48). The presentation of several risk assessment systems in children with CHD undergoing cardiac surgeries is of a scientific-theoretical nature, with a detailed discussion of the RACHS-1 (Risk Adjustment in Congenital Heart Surgery) system, which divides patients into groups from 1 to 6, proportional to the risk. A scientific-practical contribution is the retrospective analysis of 973 children undergoing cardiac surgeries, classified according to the RACHS-1 system, in which it was established that the largest share of surgeries was low and medium risk (categories 1 and 2) – 63%. Early operative mortality increased statistically significantly to 10.8% ($p < 0.001$) with increasing risk category from 1 to 6 and was higher than that in European centres, where it reached 4-6.8%. The study concluded that the RACHS-1 system for risk assessment in cardiac surgery in children with SCI is easily applicable and highly effective.

- **Rare clinical cases.** The author has a series of publications on rare clinical cases (No. 1, 2, 3, 4, 7, 8, 11, 45) with scientific and practical contributions. One of the cases - abstract No. 2 of the reports with impact factor, was presented at the Annual Meeting of the European Society of Pediatric Cardiology (AEPC) in 2022 in Geneva. A rare case of intrauterine constriction of the ductus arteriosus due to the intake of serotonin reuptake inhibitors is presented, which necessitated

emergency delivery with subsequent transient pulmonary hypertension in the newborn (No. 8). An unusual case of transient 2:1 AV block during fetal life is described of unspecified aetiology, with the child having stable sinus rhythm at birth and up to 6 months of age (No. 45). A case of candidal endocarditis requiring mitral valve replacement in a child weighing 3.9 kg, with the smallest possible mitral valve prosthesis successfully placed – 16 mm (No. 7). A case of cerebral venous thrombosis in a child after otitis media (No. 11), overcome with oral anticoagulant treatment, is presented. A case of transient complete AV block in a child with multisystem inflammatory syndrome requiring emergency temporary pacemaker placement is described. A case of retroperitoneal aortofemoral bypass in a patient with a horseshoe kidney and aortoiliac occlusive disease with stent thrombosis in the iliac artery is published (No. 1). A patient with infrarenal aortic dissection with lower limb ischemia is presented (No. 2). Several cases of carotid artery pathology, including elongation and kinking, and a migrated stent, have been described (No. 3, 4, 5).

- **Scientific contributions in other areas of pediatric cardiology.** The author has broad scientific interests in many areas of paediatric cardiology, including cardiomyopathies, thrombosis in childhood and patent ductus arteriosus in premature newborns. A classification of cardiomyopathies in childhood is presented, as well as an algorithm for predicting the risk of sudden cardiac death in children with hypertrophic cardiomyopathy (No. 29, 35). Contemporary recommendations for the treatment of venous thrombosis in children are summarized (No. 32), and the available studies on the use of new oral anticoagulants in childhood are described (No. 32). The contemporary diagnostic and therapeutic approach to patent ductus arteriosus in premature newborns is presented (No. 24, 49).

- **Scientific contributions in other fields of medicine.** Dr Vasileva has several publications in the field of cardiology (No. 12, 17, 18, 19, 47, 50, 51, 52, 53, 54, 57, 62, 64, 68, 71, 73, 74, 82, 83), paediatrics (No. 6, 9, 26, 27, 28, 33, 38, 58, 65), endocrinology (No. 55, 60, 66, 67, 70, 72, 75, 77, 78, 84, 85, 86, 87). The cardiovascular complications of Kawasaki disease in adulthood are described (No. 52). Systems for assessing cardiac risk in non-cardiac surgeries are presented (No. 73). The European guidelines for the management of acute coronary syndrome and heart failure are summarized (No. 82, 83). The mechanisms, electrocardiographic findings and therapeutic approach to the different arrhythmias in childhood are presented (No. 17, 18, 19). New European recommendations for the treatment of arrhythmias in children are summarized (No. 74). A differential diagnostic and therapeutic approach to syncope is presented (No. 50). Guidelines for behaviour in asymptomatic WPW syndrome are summarized (No. 64). Novelties in the diagnosis of Kawasaki disease in childhood are presented (No. 9). The most common congenital vascular anomalies in children are described (No. 38). Novelties in the therapy of heart failure in diabetes are presented (No. 86, 87). Guidelines for therapeutic

behaviour in type 1 diabetes in different age groups are summarized, including a strategy in children with diabetic ketoacidosis (No. 66, 72, 77).

Scientific activity

Dr. Vasileva has participated in numerous training courses and congresses in pediatric cardiology - mostly international. She has lectured at 20 national congresses in pediatric diseases, cardiology, cardiac surgery, neonatology, obstetrics and gynaecology.

In total, for all indicators of scientific activity, Dr. Vasileva has 1076.89 points. According to a reference from the Central Medical Library at MU-Sofia, by request No. RT 635/28.10.2024, Dr Vasileva has publications in medical journals with a total impact factor of 8.051. The citation reference presented by the Central Medical Library at MU-Sofia noted 8 citations in Bulgarian sources from the library fund of the CMB, 3 citations in foreign sources in Scopus (Elsevier) and 9 in Web of Science (Clarivate), as well as 4 in other foreign freely available sources online.

In conclusion, Dr Vasileva is a leading specialist in paediatric cardiology and fetal and postnatal echocardiography in Bulgaria. She has broad and in-depth scientific interests, teaching and organizational experience. All this gives me reason to vote categorically positive for awarding the academic position of "associate professor".

Varna, 29.02.2024

Assoc. Prof. Petar Shiyachev, MD

