

REVIEW

By Prof. Krasimira Kissova, MD, DSc, Medical University "Prof. Dr. P. Stoyanov" – Varna

Subject: Procedure for holding the academic position of Associate Professor in Healthcare and sports – higher education area, professional field – Medicine, opened for Pavlina Angelova Peneva, MD, PhD, in Pneumology and Phthisiology Specialty

Pavlina Peneva, MD, was born on June 8, 1973, in Silistra. In 2001, she acquired a Master's degree in medicine, and in 2019 – a PhD degree in medicine. Starting in 2020, she is currently accomplishing her master's degree in Healthcare Management at the Medical University of Varna. In 2008, Pavlina Peneva specialized in the Clinic of Nephrology, Dialysis and Transplantation, in Bari, Italy, under the Erasmus Program. In 2010, she acquired her first CCST in internal medicine, followed by another CCST in 2014 – in pneumology and phthisiology. In the period of 1996 to 2009, Pavlina Peneva worked as a physician at a Medical Centre, where she acquired knowledge and practice in outpatient care. From 2009 to the present day, she has worked at St. Marina University Hospital – Varna. Since 2016, she has been a full-time assistant professor at the First Department of Internal Diseases at MU-Varna. In 2017, she became a doctoral student in the same department. In 2020, Pavlina Peneva was appointed as Chief Assistant Professor at ES Pulmonary Diseases and Allergology.

Thesis title: Prognostic markers for clinical and laboratory sepsis patient evaluation.

Monographs: 3 monographs with a total of 441 pages.

Research papers: 20 papers with a total of 142 pages.

Scientific reports: 3 reports.

Pavlina Peneva **conducts practical training** classes in pneumology and phthisiology for Bulgarian and international students in English language. She carries out a lecture course on lung diseases and supervises the practical summer internships for 4th-year students.

Teaching activity: Pavlina Peneva's teaching activity spans over 5 years, during which her teaching workload varies between 174 and 244 hours (below the required 220 hours). However, her professional employment in the Invasive treatment and NIV department grants her knowledge and practical techniques valuable to the young doctors who face acute conditions daily (keeping in mind the current situation in hospitals today).

Citations: 6 citations

The research papers and publications submitted for participation in the procedure reflect Pavlina Peneva's research activity in the period 2007 – 2021.

[Research papers by type:

Habilitation publication – 1

Thesis – 1

Book chapter (published abroad) – 0

Monographs, textbooks, manuals – 2

Publications in journals and collective scientific volumes – 19

Research papers by the language of publication:

Publications in Bulgarian – 16

Publications in a foreign language (English) – 3

Research papers by authorship:

Single-authored papers – 7

Co-authored papers – 12, of which as: as 1st author – 11 publications; 2nd author – 0; 3rd author – 1 publication; 4th and next author – 1 publication.

Research papers by scientific fields:

1. Public health

2. Medicine

The main research areas of Pavlina Peneva's academic papers are related to the early diagnosis of lung infections, the development of septic conditions, their timely treatment and prevention; guidelines for diagnosis and treatment of non-infectious lung diseases; some issues in the diagnosis of chronic kidney disease (CKD), diet therapy in kidney patients, and research related to infectious diseases and their impact on public health.

RESEARCH AREA 1

Early diagnosis and treatment of lung infections – bacterial contamination and viral transmission, septic conditions and timely diagnosis, guidelines and timely treatment and prevention

The selected publications reflect the author's contribution in the field of early diagnosis of lung infections, and her contribution in cases of medical emergencies, namely the development of sepsis: its early detection and initiation of treatment, complications during treatment related to the infection itself or the stay in hospital facilities.

- Pavlina Peneva's research starts with identifying the main problems of severe lung infections developed as complications after the 2009/2010 influenza pandemic with H1N1,

continues with important sepsis-related issues to the diagnosis and treatment of this otherwise life-threatening condition, and investigates the causes of sepsis transfer beyond the lungs. The issues of late diagnosis, imperceptibility of the condition, late treatment and high mortality have been researched and highlighted, especially for low- and middle-income countries, including Bulgaria. This can be recognized as a contribution to raising the awareness of medical professionals on the subject and, partially, of non-medical circles.

- The thesis "Prognostic markers for clinical and laboratory sepsis patient evaluation" addresses critical issues related to the diagnosis of sepsis and explores new approaches to early diagnosis with statistical credibility, according to the latest guidelines of the task force on sepsis – SEPSIS-3 (2016).

Delta neutrophil index (DN) has been studied for the first time in Bulgaria. In her studies, she applied the latest recommendations, developing an algorithm for detecting septic patients. The algorithm is applicable to the Bulgarian organization of medical care and can be considered one of the author's main contributions.

DNI was used as a marker for sepsis and septic shock for the first time. The correlation between DNI, IL 8 and protein C as markers for sepsis and septic shock and prognosis for mortality was investigated.

The proposed algorithm in Peneva's research on the behaviour of suspected sepsis patients addresses the attention of specialists on this serious medical condition. Her contribution in the field is not only to raising awareness but also to early diagnosis. By addressing the issue, Peneva makes us part of the WHO campaign for a "world free of sepsis".

Early treatment serves as a prevention of death and reduces the risk of long-term consequences. The use of DNI, the calculation of the criteria for SIRS, qSOFA and SOFA in the proposed behaviour algorithm in Peneva's research contributes to the actual early detection of septic patients and early treatment initiation and are in alliance with the International Guidelines for Management of Sepsis and Septic Shock: 2018.

- "Which rating system is better - qSOFA or SIRS?" paper questions the effectiveness of the sepsis detection system and is one of the first to compare the two scores after the adoption of the new sepsis criteria in 2016. For Bulgaria, no other investigation on the matter has been made to the present day.

- A logical continuation of the research in Peneva's thesis is a more extensive and expanded summary of the issues of sepsis in her monograph "Sepsis – known and dangerously unknown." In the last 20 years in our country, there has been limited research on sepsis, and after the adoption of new criteria, i.e. after 2016, there have been only a few investigations in the field. The monograph considers the latest definition, diagnosis and treatment of sepsis and septic shock. The location and indications of artificial lung ventilation and haemodialysis have been discussed in detail, basic recommendations for patients' nutrition are specified. There is limited information on resuscitation, post-resuscitation and post-sepsis syndrome in the research literature, although they are realities, not just casuistry. The monograph summarizes the current knowledge of the

severe clinical syndrome called "sepsis" and can be considered a guide for all clinical specialists – physicians, post-graduate residents, interns, and students.

RESEARCH AREA 2

Guidelines for the diagnosis and treatment of non-infectious lung diseases

The main focus in this research area is on important non-infectious lung diseases, such as bronchial asthma, chronic obstructive pulmonary disease and systemic diseases involving the lungs. Peneva's research interest is challenged by the sometimes difficult diagnosis, ineffective treatment in certain patients, the discovery of new pathogenetic mechanisms and related therapy guidelines. International recommendations/guidelines are published annually. The novelties in these guidelines reach a wider range of specialists through explanations and publications of individual authors. Thus, through the various readings, we emphasize and accentuate the details in order to be prepared for adequate and timely treatment.

RESEARCH AREA 3

Problems in patients with chronic kidney disease and diet therapy in kidney patients

A significant part of Peneva's research papers is dedicated to patients with kidney problems.

- The paper "Oxidative stress – a trigger and regulatory mechanism in the pathogenesis of glomerulonephritis" discusses important pathogenetic mechanisms in glomerulonephritis, one of the conditions in renal pathology which are extremely difficult to treat and often even to diagnose.

- Peneva's interest in kidney problems is shown in the collective monograph "Nutrition of patients with the most common kidney diseases – modern strategies", published in 2020. This is a long-time accumulated collective work, complementing the literature in the field of modern nutrition with the scientific contribution of nephrologists and nutritionists in the field of diet therapy.

RESEARCH AREA 4

Other areas related to the general health of the individual and important issues related to public health

- The emphasis is on nutrition and supplementation of various elements and vitamins related to human health and some health issues associated with their deficiency.

- Pavlina Peneva focuses on public health and the health of the human population in the conditions of COVID-19 pandemic. Peneva has published two papers dealing with the problems of diagnosis and treatment of COVID-19 patients, and at the same time, addresses critical issues related to the concomitant diseases of these patients. She makes an essential emphasis on cancer patients who have been delayed in their treatment for various reasons during the pandemic.

I cannot refrain from some remarks: the number of published papers is limited, although in 18 of them (more than 95%), Pavlina Peneva is a single or 1st author. I accept the revisions in the Rules and regulations of MU-Varna (scoring), qualifying to supersede the number of articles, thus enabling Pavlina Peneva, MD, to meet the minimum criteria for the academic position of Associate Professor.

For me, summarizing my impressions on the work of Pavlina Peneva, MD, PhD, her significant contributions are: modern ideas (inclusive of her research) concerning non-bacterial (including viruses) such as Covid, Influenza – A1H1, HIV – the scourge of our times; sepsis as the most severe form, including multiorgan failure; delta neutrophil factor and IL8 as prognostic and predictive markers for the development of sepsis. The second important focus in the work of Pavlina Peneva, MD, PhD, is renal pathology. Aspects, which have been little explored previously, such as the importance of nutrition, vitamin K intake (unsuspected), oxidative stress in triggering glomerulonephritis have been researched (in a team). Along with that, she provided systematic reviews on obstructive pulmonary diseases such as bronchial asthma, COPD and the impact of Covid on them.

I recommend the applicant to increase the publication activity.

CONCLUSION

I have known Pavlina Peneva, MD, for many years. For me, she is an intelligent specialist – and internist whose research interests go beyond lung pathology with severe infections and predictive markers (delta neutrophil index IL8) and obstructive pulmonary diseases. She also sheds light on little-developed problems in nephrology (nutrition, vitamin K, oxidative stress).

In light of the new interpretations of the Rules and Regulations of MU-Varna for academic staff development, Pavlina Peneva, MD, meets the legal requirements of the Development of the Academic Staff in the Republic of Bulgaria Act (DASRBA) and MU-Varna. Therefore, I put forth to the esteemed jury members my proposal to award Pavlina Peneva, MD, PhD, the academic position of Associate Professor.

Reviewer:

Prof. Krasimira Kissova MD, DSc

