

## REVIEW

of the dissertation for awarding the educational and scientific degree "**doctor**" of **Dr. Dimitrinka Rosenova Dimitrova**, full-time doctoral student, by MU-Varna Rectors's Order № P-109-46/30.01.2020 in field of higher education 7. Healthcare and sports, professional direction 7.1 "Medicine", scientific specialty: "Occupational diseases", on the topic "**Occupational risk factors in the epidemiology of stroke**" with scientific supervisor **Prof. Veselinka Dimitrova Nestorova, MD**

### Reviewer:

**Prof. Silva Peteva Andonova - Atanasova, PhD, DSc**

Internal member of the Academic jury

Executive Director of University Hospital "St. Marina" - Varna,  
Head of Department of Neurology and Neuroscience, Faculty of Medicine,  
Medical University "Prof. Paraskev Stoyanov" – Varna

This review was prepared in accordance with MU-Varna Rector's Order № P-109-35/07.02.2024 and it is compliant with all requirements of the Act for the Development of the Academic staff in the Republic of Bulgaria, the Regulations for the Application of the ADASRB and the Regulations for the Development of the Academic Staff at MU-Varna.

Dr. Rosenova has presented all necessary documents as required by the RDAS at MU-Varna.

### **Brief biography:**

Dr. DIMITRINKA ROSENOVA DIMITROVA was born in 1989 in General Toshevo. She completed her secondary education in 2008. In 2015, she graduated "Medicine" MA programme at Medical University - Varna. In 2021 she earned a specialty in "Neurology". Dr. Rosenova started her career as a resident physician in the Emergency Department of the "St. Anna" Hospital -Varna, where she has been working since November 2015 until 31.07.2016. In August 2016 she began her post-graduate studies at Second Neurological Clinic at University Hospital "St. Marina"- Varna. She began her academic career in 2020, when, after winning a competition, she became a full-time doctoral student in the doctoral program "Occupational Diseases" at the Department of Occupational Diseases, Department of Optometry and Occupational Diseases - MU- Varna, in the professional field 7.1 Medicine.

Dr. Dimitrinka Rosenova teaches "Occupational Diseases" to Bulgarian- and English-speaking medical students at Medical University of Varna, as well as "Neurological Diseases" to students studying Kinesitherapy and Speech Therapy.

She has participated in a number of thematic qualification post-graduate courses: Pedagogical competence, Legal framework regulating the education of doctoral students; Research methodology; Research ethics; Statistical methods for data processing and presentation; Communication techniques and presentation skills, etc.

Her main professional and academic interests are in the fields cerebrovascular diseases, inflammatory diseases of the nervous system, occupational neurological complications. She has good teamwork, communication and organisation skills.

Dr. Dimitrinka Rosenova Dimitrova is fluent in written and spoken English.

She is a member of the Bulgarian medical association and the Bulgarian Society of Neurology.

Dr. Rosenova ended her postgraduate studies as per MU-Varna Rector's Order № P-109-35/07.02.2024 as recommended in report protocol № 102-287 /23.01 .2024 by prof. Zornitsa Ivanova Zlatarova-Angelova, MD, PhD – head of the Department of Optometry and Occupational diseases, with Faculty Council decision № 218/01.02.2024 and report protocol № 104-133/05.02.2024 by Prof. Antoniya Slavcheva Dimova-Yordanova, PhD – dean of the Faculty of Public Health at the Medical University “Prof. Paraskev Stoyanov” – Varna.

### **Importance of the topic:**

Dr. Dimitrinka Rosenova's dissertation is devoted to quite a relevant topic. Cerebrovascular diseases are among the most important health care problems in developed countries. Stroke is the second leading cause of death and permanent disability worldwide. The general rules for the diagnosis and treatment of cerebrovascular diseases are presented in the "Algorithms for the diagnosis and treatment of cerebrovascular diseases", 2012 and the National consensus on the prevention, diagnosis and treatment of cerebrovascular diseases, 2013, 2018 and 2020. ; 2014 Nervous Diseases Medical Standard; "Project for the development of interventional neurology in the Republic of Bulgaria, 2016; "National consensus on ultrasound diagnosis and management of extracranial carotid pathology", 2011 and 2020, as well as the European and American consensus in this direction. They are guideline-based and based on multicenter randomized clinical trials or meta-analyses. At present, there is sufficient data and studies related to the importance of standard risk factors for stroke. Occupational risk factors in the epidemiology of stroke remain poorly studied worldwide, as well as in Bulgaria. Given that the stroke has been defined by the World Stroke Organization as the "epidemic of the 21st century", the dissertation, which examines occupational factors and their harmful impact and severity in the etiopathogenesis of cerebrovascular diseases, is particularly relevant.

### **Structure of the dissertation:**

The thesis is well-structured. Contains 87 pages in total, 17 figures, 17 tables and 3 appendices. The bibliography covers 156 literary sources in total, 2 of which in Cyrillic and 154 Latin script, with 60% of the citations being from sources published within the last 10 years.

**In the introduction**, the doctoral student substantiates the significant medico-social aspect of the problem of stroke and occupational risk factors.

**The literature review** includes data on the epidemiology of stroke, its classification. The main modifiable risk factors, as well as occupational factors determining the risk of MSDs, are examined in detail. At the end of the literature review, conclusions were drawn about the existence of single studies on the influence of occupational risk factors in the epidemiology of cerebral strokes both in the world literature and in Bulgaria. Special attention is paid to the risk to public health from the adverse impact of production factors, environmental pollution, workplace stress, inappropriate work and rest regimes among the working population.

**The main aim** of the dissertation is to study the role of occupational risk factors in the epidemiology of strokes in patients of working age. Using an appropriate survey with a

questionnaire developed by the researcher, conducting clinical, laboratory and neuroimaging tests - CT and/or MRI of the head, to test the working hypothesis:

- ✓ There is dependence in patients with a total work experience of more than 30 years and a risk of stroke;
- ✓ There is an increased risk of stroke in those who work primarily a manual labour;
- ✓ There is an increased risk of stroke in patients who have harmful habits /smoking and alcohol consumption/.

The **six tasks** set by the dissertation are clearly formulated, specific and directly related to the set goal.

**The object of the study** is a total of 351 patients, all with a realized acute cerebral stroke, of working age and hospitalized in the Second Neurological Clinic of University Hospital "St. Marina" - Varna in the period November 2021 - January 2023. A clinical examination was conducted on the participants, the presence of risk factors was specified, and a detailed professional history was taken. For the purposes of the study, assessment scales were used to find disturbances in the level of consciousness and the severity of the stroke.

**Results and discussion:** Dr. Rosenova's dissertation work is distinguished by detailed analysis of the obtained results and a clear presentation of the conclusions arising from them. The average age of the patients was  $55.8 \pm 7.09$  years. There is an increased occurrence of stroke in patients in working age. The study found a higher risk of stroke among current and former smokers. Of the analysed modifiable vascular risk factors, only dyslipidemia showed a statistically significant correlation dependence. Analysis of the data showed that occupation was also related to the probability of having a stroke, with the relationship being directly proportional. Risk is highest for those who work primarily in manual labour. **A significant finding** is that longer work experience (>30 years) and work involving predominantly physical labour correlates with a higher occurrence of stroke in the study population. A statistically significant relationship is also present between the stroke and "working indoors", the dynamic work posture, monotonous movements and the lack of performance based objective. The frequency of stroke increases statistically significantly among men and with increasing age of patients. The average age of the patients in the study population was approximately 56. Ischemic stroke increases with age while hemorrhagic stroke decreases. No statistically significant correlation was found between the length of the working day, the level of stress, the mode of work and the frequency of stroke among patients. Analysis of the NIHSS Focal Neurological Deficit Severity Scale data at admission and at discharge showed a downward trend, which corresponded to a better prognosis and potential for long-term recovery.

### **Contributions:**

In the final section, five conclusions are made, which are a logical conclusion of the exposition, incl. the conducted statistical analyzes and conclusions. Three of the contributions are of an original nature:

1. For the first time in our country, a study was conducted on the influence of occupational risk factors in the epidemiology of brain strokes in patients of working age;
2. The relationship between levels of occupational stress and stroke in patients of working age was analyzed;
3. A comparative analysis of the degree of recovery of the functional deficit from the stroke during hospitalization and dehospitalization in patients of working age was carried out.

## Conclusion

Dr. Dimitrinka Rosenova Dimitrova's dissertation is compliant with all requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria and Regulations at MU-Varna for awarding the educational and scientific degree "Doctor" of Medicine.

I recommend to the honourable Academic Jury to vote in favour for awarding the educational and scientific degree "Doctor" in Medicine, in the field of higher education: 7. "Health and Sports", professional direction: 7.1 "Medicine", scientific specialty: "Professional diseases" by Dr. Dimitrinka Rosenova Dimitrova.

Varna

07.03.2024

Reviewer:

(Prof. Silva Peteva Andonova - Atanasova, PhD, DSc)

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