

OPINION

by Prof. Dr. Gospodinka Radeva Prakova-Vasileva, PhD - Head of the "First Department of Internal Medicine and General Medicine" at the Medical Faculty of Trakia University - Stara Zagora

of a dissertation for the award of an educational and scientific degree

"Doctor", in the field of higher education 7. Health care and sports, professional direction 7.1. Medicine, Doctoral Program "Occupational Diseases"

Pursuant to the Order of the Rector of Medical University-Varna No. P-109-35/07. 02. 2024

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Dissertation topic: "Occupational risk factors in the epidemiology of cerebral strokes".

1. General presentation of the procedure and the doctoral student

The presented set of materials on an electronic medium is in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Rules for its Application at the University of Varna for the acquisition of the educational and scientific degree "Doctor", and includes all the necessary documents.

Dr. Dimitrinka Rosenova Dimitrova obtained a master's degree in medicine in 2015 from MU-Varna and began working as a resident physician in the Emergency Department of the Multidisciplinary Hospital for Active Treatment "St. Anna" - Varna. From 2016 to 2020, he was a specialist in Nervous Diseases at the II Neurological Clinic of UMBAL "St. Marina" - Varna, where he currently works. Since 2021, he is a specialist in Nervous Diseases, and since 2019, he is an assistant at the Department of Physiotherapy, Rehabilitation, Sea Therapy and Occupational Diseases, Board of Occupational Diseases at the Faculty of Public Health of MU-Varna. By Order of the Rector of MU-Varna dated 31.01.2020, Dr. D. Dimitrova was enrolled as a full-time doctoral student in the doctoral program "Occupational diseases" with the topic of the dissertation: "Occupational risk factors in the epidemiology of strokes". Dr. D. Dimitrova's scientific interests are mainly in the field of neurological diseases and risk factors in the working environment, as the cause of their occurrence. She has completed a number of qualifying thematic courses for postgraduate studies: Pedagogical competence, Methodology of research work, Ethics of scientific research, Statistical methods for data processing and presentation, Communication techniques and presentation skills, etc. He has a certificate of mastery of highly specialized activity in Clinical Electromyography.

Dr. Dimitrinka Rosenova Dimitrova speaks English, certified on the Blackboard platform with level B1 (CEFR). He is a member of the Bulgarian Medical Union and the Bulgarian Society of Neurology.

2. Actuality of the dissertation work

Cerebrovascular diseases are one of the most common reasons for the deterioration of the quality of life, they increase their share in the structure of general diseases, especially in countries with a high standard, and can be the cause of the occurrence of permanent complications and disability of patients. In recent years, there has been a trend for cerebrovascular injuries to appear at an increasingly younger age, which affects the working population and determines the socio-economic significance of this pathology. Risk factors related to lifestyle as a cause of the appearance of these diseases have been studied in detail. The absence of studies aimed at researching the factors of the work environment and the work process as a cause of cerebrovascular disorders determine the innovative approach and the relevance of the current dissertation work. The latter is aimed at the characterization and analysis of occupational risk factors in the epidemiology of cerebral strokes, which will serve for early diagnosis and successful prevention of acute cerebrovascular accidents.

3. Structure of the dissertation work

The dissertation contains all the main sections. It is presented in a volume of 87 standard pages, contains 17 figures, 17 tables and 3 appendices, including: introduction, literature review, aim and tasks, working hypotheses, material and methods, own results, discussion and conclusions. The bibliography contains 156 sources, of which 2 are in Cyrillic and 154 are in Latin, and 60% of the cited sources are from the last 10 years.

➤ *Literature review*

The literature review, presented in 28 pages, is logically structured and shows sufficient knowledge of the problem from available scientific sources. Epidemiological data on the prevalence of brain accidents were analyzed, noting an increase in frequency and a significant "rejuvenation" of the pathology. The modern classification of cerebrovascular injuries and the socioeconomic consequences are presented. Risk factors in the etiology of cerebral strokes are characterized, defined as modifiable and behavioral (arterial hypertension, diabetes mellitus, hypercholesterolemia, carotid artery stenosis, atrial fibrillation, persistent foramen ovale, sleep disorders, non-physiological diet, alcohol abuse and smoking) . A separate section presents the occupational risk factors associated with an increased risk of cerebrovascular diseases (workplace stress, heavy metals, the nature of work and work posture, changed work mode, production dust). Particularly valuable is the detailed description of the effect on brain structures of persistent organic pollutants, related to their exposure-induced dyslipidemias, atherosclerotic changes with different localization and, as a consequence, heart attacks and strokes. The literature review ends with conclusions that determine the main goal of the dissertation aimed at studying the role of occupational risk factors in the epidemiology of brain strokes in patients of working age.

To fulfill the set goal, 6 tasks were defined and three scientific hypotheses were formulated for the existing positive correlation between the length of work experience, physical work and harmful habits (smoking and alcohol consumption) on the one hand and the risk of stroke on the other.

➤ *Research methodology*

The object of the study are 351 patients hospitalized in the Second Neurological Clinic of UMBAL "St. Marina" - Varna, in the period November 2021-January 2023. Inclusion and exclusion criteria are correctly specified. For the purpose of the study, a questionnaire was developed and presented in a separate appendix. The clinical examination includes neurological status, laboratory and imaging studies, the National Institute of Health Stroke Scale (NIHSS) and clinical outcome assessment, as well as the Glasgow-Liege Coma Scale (GLCS) with very good prognostic value. For the statistical processing of the data, a specialized software product SPSS v. 26.0, and the obtained results are presented in tables and figures.

➤ *Results and Discussion*

The results of the own studies are in a volume of 27 pages, of which 7 pages are a summary, 17 tables and 17 figures. The analysis of socio-demographic characteristics showed a higher frequency of stroke among men and in the age range of 52 to 64 years. A tendency towards a decrease in hemorrhagic brain incidents with age and an increase in ischemic ones was established. The relative share of patients with an average level of education is the highest. Of the studied modifiable factors affecting the risk of stroke, the most important are alcohol consumption, smoking, dyslipidemia. Regarding comorbidity, the high frequency of arterial hypertension (93%) and diabetes mellitus (27%) was confirmed in stroke patients. The analysis of the factors related to the profession of the patients showed a positive correlation between the total work experience over 30 years, physical work, work in closed rooms, dynamic work posture, uniform movements and the risk of stroke. No statistically significant correlations were found between the length of the working day, the level of stress, the mode of work and the frequency of stroke among the respondents. The relative share of patients exposed to physical hazards is significantly higher, followed by chemical and biological factors, without a statistically significant correlation between occupational hazards and the diagnosis of stroke. Analysis of NIHSS data at admission and at discharge showed a downward trend that corresponded with a better prognosis and potential for long-term recovery. In this section, there are no data on the scale used to assess the level of consciousness (Glasgow-Liege Coma Scale-GLCS) with a prognostic value (described in the research methods) and the results obtained from its application. A significant part of the tables and figures that contain the same information could be combined and the data presented only in tabular or graphical form.

In the discussion of the dissertation, presented in a separate section, Dr. D. Dimitrova compares her own results with those in other scientific publications, highlighting the confirmatory data and analyzing the differences obtained in the group she studied and those reported by authors in other countries of Europe and the world. The dissertation ends with six conclusions, which follow the set tasks and scientific hypotheses.

The original contribution of the dissertation work of Dr. D. Dimitrova consists in the study conducted for the first time in our country, the purpose of which is to evaluate the influence of various occupational risk factors in the epidemiology of cerebral strokes in patients of working age and to analyze the degree of recovery of the functional deficit after a stroke upon discharge from the hospital. Some of the contributions have a confirmatory nature and support the conclusions of other similar studies about the role of the vascular risk factor, dyslipidemia and some demographic indicators (age and gender) in the increased incidence of strokes. With his

results, Dr. D. Dimitrova confirms the positive relationship between stroke on the one hand and work experience, dynamic work posture, physical work and uniform work movements. The bibliography contains 156 literary sources (2 in Cyrillic and 154 in Latin), most of which are from the last 10 years.

4. Assessment of the publications and personal contribution of the doctoral student

Dr. D. Dimitrova has presented 3 scientific publications, one of which she is the first author of. He has participated in six scientific conferences with reports and posters.

5. Abstract

The abstract is structured in accordance with the requirements, contains 50 pages and corresponds to the content of the dissertation work. Illustrated with 17 tables and 17 figures.

CONCLUSION

The materials submitted for opinion give me reason to believe that Dr. D. Dimitrova has made a major contribution to the development of this dissertation, possesses theoretical knowledge and professional skills in the scientific specialty "Occupational diseases". Despite the remarks, comments and recommendations made, I believe that the dissertation meets the requirements of the Reason for the Development of the Academic Composition in the Republic of Bulgaria and the Regulations for its Application at the Medical University-Varna. This is the reason for my positive assessment of the awarding of the Educational and Scientific Degree "Doctor" to Dr. Dimitrinka Rosenova Dimitrova in the scientific specialty "Occupational diseases", in professional direction 7.1. Medicine, from the field of higher education 7. Health care and sports.

03/05/2024

Stara Zagora

Prepared the opinion:

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