

To the Scientific Jury
Determined by the Rector
of MU "Prof. Dr. Paraskev Stoyanov" Varna
By order No. R-109-169/22.05.2024

OPINION

By Assoc. Prof. Teodora Nedeva, MD, PhD
RU "Angel Kanchev", FOPHHC, Department of "Medical, Clinical and Diagnostic Activities",
Deputy Head; COC - Ruse, AICU - anesthesiologist

Subject: Doctoral thesis on " **CHANGES IN WATER-ELECTROLYTE BALANCE IN ORGAN DONORS WITH BRAIN DEATH AND THEIR CORRECTION IN THE INTENSIVE CARE UNIT**",

in the scientific specialty "Anesthesiology and intensive care", professional field 7.1 Medicine.

Author of Dissertation: Boryana Ivanova Georgieva, MD

Dear Colleagues,

I received a set of paper and electronic documents which contained: orders, declarations, CV, abstract of the dissertation, list of publications and dissertation of Boryana Ivanova Georgieva, MD. Their type and volume completely fulfill the requirements for the development of academic staff of MU Varna, for awarding the ESD "Doctor". According to the order of the Rector of MU "Prof. Dr. Paraskev Stoyanov" Varna, with No. R-109-169/22.05.2024, I am included in the Scientific Jury and after a decision from its first meeting, I am appointed to present an opinion on the dissertation work (report No. 1/03.06.2024).

1. Brief biography of the researcher: Dr. Boryana Ivanova Georgieva was born in 1993 in the town of Chirpan. She graduated her secondary education in the language school "Romen Rolan" in Stara Zagora, and her higher education of Medicine and Health management in Varna. In 2018, she started working as a medical doctor at Emergency Department – Valchi dol; from 01.02.2019 she works and specializes in AICU in UMHAT "St. Marina" Varna. From 2019 to the present, she also works in the DCC "St. Marina", in an office for the treatment of acute and chronic pain. Since 14.10.2020, she teaches Bulgarian students of AICM. From 10 – 12. 2020, she was teacher of Hygiene in the Department of "Hygiene and epidemiology: in MU Varna. She is a member of BDS and Society of Anesthesiologists in Bulgaria. There are publications in Bulgarian bulletins. Participates in national and international scientific forums.
2. **Annotation of the problem:** Brain death is a state of complete and irreversible cessation of all brain functions, including the brain stem, while maintaining circulation in the rest of the body. Causes can include traumatic brain injuries, cerebrovascular incidents, anoxia, infectious or neoplastic processes. The percentage of patients with severe primary or secondary brain damage developing brain death ranges between 50% and 65%, according to different authors. They represent a major potential source of organs from cadaveric donors. Against the backdrop of an ever-increasing need for organ donors, Bulgaria ranks last among European Union countries in the number of transplants per million population. Alongside

refusals of donation by patients or their relatives, the reasons for this statistic include unidentified and unreported potential donors. This necessitates good theoretical and practical training for specialists from various units, easy communication between them, quick assessment of the patient's condition, and an appropriate approach to relatives.

Early recognition and confirmation of brain death are crucial for the success of the donor process. Diagnosing patients includes a clinical examination followed by several instrumental investigations to confirm the results already obtained. After the diagnosis is made, a policy of aggressive donor management is initiated. Organ-protective therapy aims to ensure optimal organ perfusion and preserve them in the best possible condition until explantation.

3. **Analysis and evaluation of the dissertation work:** I approach my colleague's work with the clear awareness that dissertations are unique works of authorship. Despite the guidelines taught in doctoral schools, there are no strictly fixed frameworks for writing a doctoral thesis, but nevertheless exemplary models confirmed over time by the scientific community are followed.

3.1. **Overall Volume and Structure:** This dissertation contains 131 standard pages. The author's research and literature data are presented in 10 sections, the second, fourth and fifth of which also have subsections. It is illustrated with 52 tables and 45 figures.

The distribution of information is as follows: Abbreviations used in the text - 1 page, Introduction - 1 pages, Literature review - 34 pages, Aim and objectives - 1 page, Objects and methods of clinical research - 7 pages, Results and Discussion - 57 pages, Conclusions and Contributions - 1 page, Bibliography - 22 pages, Bibliography – 8,5 pages, Аппликации – 9 pages and List of publications on the topic – 0,5 page.

- 3.2. **Format and content of sections:** In my assessment, the paper is written clearly, with good expression and style. The "Contents" tab lists does not point out the number of pages of the different sections. This makes difficult their quick and easy finding in the exhibition. The layout and formatting of the pages is good and makes the information easy to read. But, in my judgment, there are some unnecessarily detailed and in some places clumsy-sounding passages, especially in the descriptions of Literature review and the Results, which for me personally was associated with difficulties in maintaining sufficient concentration to read, understand and evaluate the information that the author offers. All tables and figures are clearly explained, which greatly contributes to the understanding of the obtained results. There are some minor discrepancies in the citation of results in tables and the corresponding figure, as well as single spelling errors. The different sections are titled and follow generally accepted models in the presentation of a doctoral thesis. The critical assessment of the situation in our country makes a very good impression on me. *Section "Introduction":* the main characteristics of the research problem, historical data and the position of the author regarding her choice to study this particular topic are presented.

"Literature review" section: Positions of various authors are presented in details regarding: definition, etiology, pathophysiology and pathomorphology of brain death; the methods for making this diagnosis, the changes that occur in the water-electrolyte balance and the techniques for their correction are described in detail. I lack a generalized analysis of the literary data (of course, it is not a mandatory element), from which to naturally and logically formulate the main goal and the tasks that the dissertation student sets for himself. It is accepted that the literature review should be about 30% of the total volume of work. In the present one, this is observed.

"Aims and Objectives" Section: The main aim of the study and the five objectives associated with it are clearly and concisely stated and I fully accept them as such.

Section "Materials and methods": The design of the work is a retrospective, observational, monocentric study. It covers a 6-year period (01.01.2014 – 31.12.2020). It was carried out by a team from the Clinic of Anesthesiology and Intensive Care at "Sveta Marina" UMBAL EAD, Varna, with the main researcher - the dissertation student. It was held in the structures of UMBAL "Sveta Marina" EAD, Varna. On the basis of inclusive criteria, 73 patients over the age of 18 with proven "brain death" were selected. The study was approved by KENIMUV.

Subjects of research are patients in brain death, conditioned as potential organ donors. They are presented in 1 group, described by gender, age, cause of brain death. The subject of study are deviations in the water-electrolyte balance that occurred in each of these cases and the ways of their correction in the intensive care unit. Data on the patients and the various violations that occurred are described in detail in graphical and tabular form, for which the definitions used by the author's team are proposed and used.

"Methodology of the clinical study": presents in details the methods of evaluation and follow-up of the included patients: documentary, clinical, imaging, laboratory, therapeutic methods (mechanical ventilation, application of gastroprotector, Minirin, sympathomimetics, Insulin, potassium preparations and VER), methods for monitoring a potential organ donor and statistical methods. Statistical data processing is with up-to-date software products including classic data analyses.

"Results and discussion" section: in great detail, on 57 pages, the data obtained by the author are described in tabular, graphic and narrative form. She compares her own with results of other researchers of the problem. The solution of the set tasks is presented in fulfillment of the main objective of the research. I believe that the obtained results are important and very useful for clinical practice. Having in mind the rarity of this condition and the associated hesitations and concerns experienced by teams involved in donor management, I believe it is appropriate for the dissertation student to present/publish the information to a wider audience to be useful for the day-to-day work of the anesthesia teams involved in managing a donor situation. I appreciate the fact that the author writes self-critical notes about the limitations and shortcomings of a retrospective study. Admirations also for the concluding part, which presents an abbreviated version of the obtained results and is a natural transition to the Algorithm for the correction of changes in water-electrolyte balance and behavior in a brain-dead potential donor.

"Conclusions" section: 6 conclusions are clearly formulated. I accept them in the way they are presented.

Section "Contributions": they are summarized in 4 scientific - practical and scientific - theoretical. They are clearly described and I accept each of them.

The author presents all the applications and forms he used for his research.

Bibliography section: 124 literary sources are included, which are sufficient for a detailed study of the experience of various researchers. They are arranged alphabetically, starting with those in Cyrillic. There are very few Bulgarian publications, only 5, which is a rather unrealistically low number. In my opinion, on the one hand, this is a confirmation of the uniqueness of the chosen topic, but on the other hand, it shows that either few Bulgarian anesthesiologists are involved in finding, proving and implementing organ donors or they simply do not publish and share their experience or the author has not found more publications (eg Vilian Platikanov, Organ donation - Essence, detection, realization; Varna 2012, ISBN 978-954-9685-68-8). Whatever the real reason may be, it is currently of no essential importance and does not change the good qualities of the work. My recommendation to the author is to promote her research to the anesthesiology

community, present to us the data she has collected and summarized, and above all the Algorithm for management of potential organ donor with brain death

The main share in the bibliography is occupied by works published in the last decade, and 26 were published in the last 5 years. They are arranged in alphabetical order and are cited in the text.

The author presents only 2 scientific publications on the topic of the dissertation and 10 out of it, which according to the requirements of the Varna University of Medical Sciences is sufficient activity to acquire the ESD "Doctor".

4. **Abstract:** it is printed on 67 pages, presenting information about the content of the dissertation in a compressed version. This is appropriate because it allows the reader to get acquainted with the main ideas of the scientific research and to quickly and easily find the obtained results and conclusions.

Conclusion: based on the aforementioned, I think that the presented dissertation work is valuable in practical and scientific terms.

I am thus certain in granting POSITIVE assessment of the scientific thesis and vote "YES", to award the ESD "Doctor" to Boryana Ivanova Georgieva, MD

Заличено на основание чл. 5,
§1, б. „В“ от Регламент (ЕС)
2016/679

04.07.2024

Prepared the opinion:.....
/ Assoc. Prof. Teodora Nedeva, MD, PhD/