STATEMENT

From

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Member of the Scientific Jury by Rector's Order № R-109-268/05.08.2024

Regarding: Procedure for obtaining the educational and scientific degree "Philosophy Doctor" in 7. Healthcare and Sports– higher education area, 7.1 Medicine – professional field, Medical Radiology and Roentgenology speciality (including the use of radioactive isotopes). Doctoral thesis on **CT ASSESSMENT OF ABDOMINAL ADIPOSE TISSUE, BONE DENSITY AND SARCOPENIA** with research supervisor Assoc. Prof. Chavdar Bachvarov, MD, PhD

Biographical data: Dimitrina Markova, MD, was born on July 11th, 1981. She graduated from the Technical School of Veterinary Medicine in Lovech in 2000. In 2003, she completed her studies at the Medical College in Pleven, with a degree in Rehabilitation. From 2005 to 2011, she was a student at the Medical University of Pleven, majoring in Medicine. In 2011, she graduated with honours and a Master's in medicine from the Medical University of Pleven. From November 2011 to May 2015, she worked as a resident physician at the Department of Diagnostic Imaging and the Emergency Department at Dr. Bratan Shukerov Hospital in Smolyan. From May 27th, 2015 to September 17th, 2018, she worked as a physician at the Clinic of Imaging Diagnostics, St Marina University Hospital in Varna. From September 17th, 2018 to the present, she has been an assistant physician at the Clinic of Imaging Diagnostics, St Marina University Hospital – Varna. In 2018 she acquired her Certificate of Completion of Special Training in Imaging Diagnostics. Since September 2018, she has been an assistant professor at the Department of Imaging Diagnostics, Interventional Radiology and Radiotherapy. On November 2nd, 2020 she became a full-time doctoral student in the department. Her research interests are focused on breast imaging, abdominal imaging, imaging of the female pelvis and paediatric imaging.

The thesis is properly structured and consists of 208 pages distributed in the following sections: Introduction – 2 pages, Literature Review – 72 pages, Aim, Tasks and Hypothesis – 1 page,

Materials and Methods – 9 pages, Results and Discussion – 64 pages, Findings – 2 pages, Conclusion – 2 pages, Contributions – 1 page, Participation in projects, thesis-related publications and participation in scientific forums – 1 page, and Bibliography – 41 pages.

The thesis is illustrated with 4 tables and 82 figures, and the bibliography includes 511 literary sources, of which one is in Cyrillic and 510 are in Latin. There are 3 publications related to the thesis.

The thesis summary by Dimitrina Markova, MD, is presented on 74 pages, standard size. Its structure mirrors the thesis structure – without the literature review. Its content perfectly embodies the concept of the thesis, presenting the primary and crucial aspects that highlight the essence of the problem. There are no technical or literary variations between the thesis summary and the thesis.

In the **literature review**, Dr. Markova comprehensively examines the available data in the literature. It is worth mentioning the limited number of Bulgarian sources on the subject. Significant focus is given to the assessment and correlation between imaging studies and the evaluation of abdominal adipose tissue, osteoporosis, and sarcopenia in patients with oncological diseases such as colorectal carcinoma, lung cancer, chronic pancreatitis patients, and a control group.

In the **materials and methods** chapter, 96 patients were assessed, and examined through low-dose abdominal CT. All the patients were examined at the Clinic of Imaging Diagnostics at St. Marina University Hospital – Varna. They were divided into four groups: patients with colorectal carcinoma – 22 individuals; patients with lung cancer – 18 individuals; patients with chronic pancreatitis – 20 individuals; and a control group – 36 patients. The control group included healthy volunteers.

The first three groups of patients were selected retrospectively and examined using Siemens Spirit, Somatom Definition, and Somatom Force CT scanners. The control group was examined prospectively using a Siemens Somatom Force CT scanner.

The methods are clearly outlined and described in detail, with IBM SPSS v.20 software used for statistical processing.

In the **Results** section, Dr. Markova describes in detail the data obtained for the six tasks that have been set. A significant difference and dependence were found between the volume and density of subcutaneous and visceral adipose tissue and the diseases in the examined group of patients. An inverse correlation was observed between the volume and density of subcutaneous and visceral adipose tissue, with increased volume leading to decreased density, which was more pronounced for the visceral adipose tissue. A significant difference and moderate correlation were found between HUAC values and the diseases in the studied groups of patients: the lowest values were in the colorectal carcinoma patients (40.5), and the highest value was in the control group (48.57). Female sex and advanced age were associated with a higher risk of developing sarcopenia. A moderate correlation was found between the female sex and the Psoas Index and an inverse moderate dependence between age and the Psoas Index in men. A correlation was found between bone density and sex ($r = -0.454$; $p < 0.001$), indicating that it decreased in females. A direct proportional moderate correlation was found between L3 bone density and age in both sexes. A statistically significant correlation was found between VAT, L3 bone density, SAT, and the inflammation markers and blood sugar levels: increased VAT volume was associated with elevated CRP values; decreased L3 bone density was associated with high ESR values, and the blood sugar levels correlated inversely with subcutaneous adipose tissue volume and directly with SAT density.

In the **Conclusions** chapter, 6 conclusions are presented, corresponding to the set goals and tasks.

The thesis **Contributions** are theoretical, applied, and original. The most significant contribution is that for the first time in Bulgaria, the correlation between the CT assessment measurements of abdominal adipose tissue, bone density and sarcopenia was described.

Conclusion

The thesis fully meets the requirements of the Academic Staff Development in the Republic of Bulgaria Act (DASRBA) for awarding the educational and scientific degree "Philosophy Doctor". I recommend to the esteemed jury to award the educational and scientific degree "Philosophy Doctor" to Dimitrina Nikolova Markova, MD.

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

24/09/2024

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3