



Катедра Образна диагностика

4002 Пловдив, бул. В. Априлов 15А
тел.: 032 60 22 14
imaging.diagnostics@mf.mu-plovdiv.bg



Department of Diagnostic Imaging

15A V. Aprilov blvd, 4002 Plovdiv
phone: 00359 32 60 22 14
imaging.diagnostics@mf.mu-plovdiv.bg

To

The chairman of the scientific jury, determined by Order No. R-109-169 of 28.02.2023.
of the Rector of Medical University-Varna

STATEMENT

by Prof. Dr. Silvia Bogdanova Tsvetkova-Trichkova, MD,

MEDICAL UNIVERSITY - PLOVDIV

Head of the Department of Diagnostics Imaging

About:

Procedure for acquiring the educational and scientific degree "Doctor", scientific specialty: "Medical radiology and roentgenology / incl. use of radioactive isotopes/" Professional field 7.1 "Medicine" with candidate Dr. Svetomir Sevdalinov Chakarov, doctoral student in full-time study in the doctoral program "Medical radiology and roentgenology (incl. use of radioactive isotopes)", enrolled with order No. R -1-9-63/31.01.2020. Deduction order with right of public defense No. R - 109-169/28.02.2023

Dissertation topic: "Role of CT and MR enterocolonography for diagnosis and follow-up in Crohn's disease"

Scientific supervisor: Assoc.Prof. Dr. Radoslav Georgiev, MD

Basis: External member of a scientific jury appointed by Order No. P-109-169 of 28.02.2023 of the Rector of Medical University-Varna.

Brief biographical data: Dr. Svetomir Sevdalinov Chakarov graduated in medicine from Medical University - Varna in 2011. From October 2011 to September 2012, he worked in the Department of Diagnostic Imaging at the "Dr. Atanas Dafovski" Medical Center, Kardzhali, and

from October 2012 to the present, he worked at the Diagnostic Imaging Clinic of UMHAT "Sveta Marina", Varna. He acquired a specialty in Diagnostic Imaging in 2018. Since January 2020, he has been enrolled as a full-time doctoral student program at the Department of "Diagnostic Imaging, interventional radiology and radiation therapy" at Medical University Varna, and since September 2021, he has been an assistant in the "X-ray Laboratory Technician" department of MC, MU-Varna.

Dr. Chakarov is a member of: Bulgarian Association of Radiology (BAR), European Society of Radiology (ESR) and Bulgarian Medical Union (BMU)

Relevance of the topic and appropriateness of the set goals and objectives: Crohn's disease is a chronic-recurrent and destructive inflammatory bowel disease that mainly affects young patients between 20 and 40 years of age and can lead to temporary or permanent impairment of normal physical activity and work ability. Imaging has an extremely important role in establishing the diagnosis and monitoring the condition of the patients, with the methods of choice being computer tomography and magnetic resonance enterocolonography. The problems addressed in the dissertation correspond to the modern view of diagnosis and interpretation of findings. The presented topic corresponds to scientific interests. In accordance with the topic, a clearly formulated goal was identified: "To study CT and MR enterocolonography changes in Crohn's disease and to determine their role in the diagnosis and follow-up of the disease" and 6 tasks were set in connection with it. There is relevance of the problem developed in the dissertation in scientific and scientific-applied terms.

Knowledge of the problem: The literature review is extensive and thorough and shows an excellent knowledge of the problem discussed in the dissertation work. The dissertation provides a comprehensive review of modern imaging methods for diagnosing Crohn's disease and their correlation with laboratory tests, indicators of disease activity and quality of life in histologically verified patients.

Research methods: The doctoral student has chosen appropriate modern methods that allow achieving the set goal and obtaining an adequate answer to the tasks solved in the dissertation work.

Characterization and evaluation of the dissertation: The dissertation is written on 141 pages, divided into the following sections: introduction, literature review, aims and objectives of the dissertation, research methodology and organization, results and discussion, closing remarks, conclusions, contributions and references. The work includes 9 tables and 49 figures. 190 literary sources were discussed, of which 4 in Cyrillic and 186 in Latin.

The presented dissertation complies with the requirements for structuring and voluminous content.

The introduction is clearly formulated and reflects the directions of the problem under consideration and the need for its development.

The **literature review** is written on 47 pages and is comprehensive, up-to-date and refers to the goals and objectives of the dissertation work.

The **purpose** of the dissertation work is clearly formulated, the tasks set are in accordance with it.

The **Materials and Methods** section describes in details the methods used and is presented sequentially. Duration of the study - 5 years, from 2017 to 2022. Total number of examined patients - 194. Only patients hospitalized in UMHAT "St. Marina" with histologically proven Crohn's disease are included in the study. Only CT and MR images performed according to CT enterocolonography and MR enterocolonography protocol are considered. During this period, patients have a different number of hospitalizations and, accordingly, examinations, which are distributed by visits. The number of visits is six. The total number of imaging tests performed is 446 - 386 CTE and 60 MRE. In addition to imaging studies, laboratory and clinical indicators that are available for the relevant hospitalization are considered, namely - C-reactive protein, fecal calprotectin (FCP), Crohn's Disease Activity Index (CDAI), quality of life (calculated using the IBDQ questionnaire) and histological results showing activity. Computed tomographic examinations were performed on a dual source Somatom Definition 64 and Siemens Vario multidetector CT machines, Siemens Healthineers, Erlangen, Germany, and MRI examinations on a Siemens Magnetom Verio, 3T and GE Signa 1.5T.

Modern statistical methods are applied - statistical package IBM SPSS v.25 and Jamovi 2.3.24. Correlation analysis - Pearson (r) and Spierman (rs) coefficients, variance analysis (ANOVA), ROC curve analysis, descriptive statistics were used.

The analysis of the results is thorough and demonstrates the PhD student's knowledge of collecting, evaluating information and analyzing the data obtained. The results are correctly described and well illustrated through tables and figures.

In the "**Discussion**" section, the similarities and differences with the publications presented in the scientific literature are precisely examined and compared.

The conclusions are formulated specifically and clearly, reflecting the analysis of the results and meeting the set aim and objectives.

The specified contributions of the dissertation work are original, confirmatory and of practical value and are objective and derived from the results obtained. For the first time in Bulgaria, the results of CTE and MRE of such a large group of patients with Crohn's disease are performed and summarized. The Lemann index was calculated for all patients, and the MEGS was also calculated for the patients with MRE. An analysis of the most frequent changes as well as the most frequently affected segments of CTE and MRE in patients with Crohn's disease was performed. Correlation between Lemann index and IBDQ is sought. A statistical relationship was established between serum CRP levels and thickened wall over 3mm, thickened mesenteric fatty tissue, comb sign, trilaminar contrast, homogeneous late contrast and enlarged mesenteric lymph nodes. A positive correlation was found between CRP and imaging scores, Lemann index and MEGS, a positive correlation between FCP levels and MEGS value. A statistically significant relationship between CDAI and comb sign, enlarged mesenteric lymph nodes and MEGS and a significant difference in the values of the Lemann index of patients with and without subsequent surgical intervention was proven. An inverse relationship between the Lemann index and IBDQ has been demonstrated, a statistically significant difference in the Lemann index values calculated at an interval of two years, and a recommended protocol for the preparation and study of Crohn's disease patients with CTE and MRE has been developed.

The topic of the dissertation work "**Role of CT and MR enterocolonography for diagnosis and follow-up in Crohn's disease**" is current. It responds to scientific interests and research needs in this field of diagnostic imaging.

Dissertation publications: In connection with the dissertation, 3 publications are presented - 2 non-refereed full-text publications and 1 refereed full-text publication, as well as 2 scientific presentations. The number of scientific works covers the necessary quantitative criteria.

Personal involvement of the doctoral student: The doctoral student has personally participated in conducting the studies related to the dissertation work, their summarization and analysis.

Abstract: The abstract is written on 67 pages, summarizes the topic presented in the dissertation, as well as the achieved results. It is sufficient in volume and richly illustrated with tables and figures.

Critical remarks and recommendations: I have no substantive critical remarks. Recommendation – to publish all results related to the dissertation work, to maintain good publication activity, to participate a project.

Conclusion

The presented dissertation work of Dr. Svetomir Sevdalinov Chakarov on the topic "Role of CT and MR enterocolonography for diagnosis and follow-up in Crohn's disease" is an in-depth complex study with a clearly formulated goal, tasks and results and with original scientific and scientific-applied contributions. It shows the theoretical knowledge and abilities of the dissertation student to collect and analyze scientific information.

The presented materials comply with the requirements of the LDASRB and the Regulations for the conditions and procedures for acquiring scientific degrees and occupying academic positions at MU-Varna.

Based on the above, I recommend the members of the respected Scientific Jury to vote with a positive vote to award the educational and scientific degree "Doctor" to Dr. Svetomir Sevdalinov Chakarov in professional field 7.1. Medicine from the field of higher education 7. Health care and sports, Scientific specialty "Medical radiology and roentgenology (incl. use of radioactive isotopes).

25.04.2023

Plovdiv

Prepared the opinion:

(Prof. Dr. Silvia Bogdanova Tsvetkova-Trichkova, MD, PhD)

