

RECENZIA

by **Assoc. Prof. Elitsa Georgieva Deliverska-Aleksandrova, PhD**

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A member of the Scientific Jury determined by order No. R-109-410/26.10.2022 of the Rector of the Medical University – Varna city

About: acquisition of the **educational and scientific degree "Doctor"** in the field:
Higher education: 7. Health care and sports; Professional direction: 7.1. Medicine

Dissertation with a topic "Procalcitonin and delta neutrophil index levels in the surgery of head and neck inflammatory diseases"

Author: Yanko Georgiev Yankov, MD, a doctoral student - an independent form of education, according to the procedure for acquiring the educational and scientific degree "doctor", Department of General and operative surgery, Faculty of Medicine, Medical University "Prof. Dr. Paraskev Stoyanov" – Varna city

Doctoral programme: "Surgery"

Scientific Directors: Prof. Nikola Yordanov Kolev, MD, PhD, DSc

Assoc. Prof. Yana Dimitrova Bocheva, MD, PhD

1. General presentation

This statement was prepared based on the order of the Rector of the Medical University – Varna city, No. 109-410/26.10.2022.

The presented set of materials on paper and electronic media is in accordance with Art. 44 (3) of the Regulations for the Development of the Academic Staff at the Medical University – Varna city.

The doctoral student has submitted two publications and two participations in scientific events on the subject of the dissertation work, which meet the minimum national

requirements (by groups of quantitative and qualitative indicators) under the RASRB, criteria for the defense of a dissertation work for the educational and scientific degree "Doctor".

The dissertation submitted for review is up-to-date, well-structured and contains most of the mandatory parts for dissertation development – introduction, literature review, aim and objectives, results and discussion, conclusions and contributions, bibliography.

The dissertation contains a total of 104 pages and is illustrated with 49 graphics, 43 tables, 2 diagrams and 1 application. The bibliographic reference includes 135 literary sources, 2 of them in Cyrillic and 133 in Latin alphabet.

The distribution of the main parts in the dissertation is as follows: 2 pages of introduction, 20 pages of literature review, 62 pages of purpose and tasks, results and discussion, 2 pages of conclusions and contributions, 8 pages of bibliography.

2. Biographical reference for the doctoral candidate

Yanko Georgiev Yankov, MD was born on 17.04.1989 in the town of Shumen. He graduated from "Nancho Popovich" Secondary School - Shumen in 2008 with excellent results. In 2014, he graduated with a Master's degree in Medicine at the Medical University "Prof. Dr. Paraskev Stoyanov" - city of Varna with excellent (6.00) success and received the "Golden Hippocrates" award and the "First Degree" award from the Bulgarian Medical Union. In 2015, he started working as a specialist doctor in the Clinic for Maxillofacial Surgery at the University General Hospital (UGH) "Sveta Marina" – Varna city, where he is currently working.

In 2016, he graduated with a master's degree in Health Management at the Medical University "Prof. Dr. Paraskev Stoyanov" – city of Varna.

From February 2019 to October 2019, he worked as a part-time assistant in Oral and Maxillofacial Surgery at the Departments of Oral and Maxillofacial Surgery (Faculty of Dental Medicine) and General and Operative Surgery (Faculty of Medicine) at the Medical University "Prof. Dr. Paraskev Stoyanov" – city of Varna.

After winning a competition in 2019, he was appointed full-time assistant in Maxillofacial Surgery at the Department of General and Operative Surgery at the Medical University of Varna. In July 2020, he took a specialty in maxillofacial surgery.

He is a member of the Bulgarian Medical Association.

3. Relevance of the dissertation work

The actuality of the topic is determined by the clinical challenges in the treatment of inflammatory diseases of the head and neck, which are frequent pathologies in daily practice. These diseases can have an aggravated course due to their neglect in the early stages by the patients. Poor and untimely diagnosis can have fatal consequences for the outcome of treatment. Severe infections in the maxillofacial area, especially with comorbidity, is associated with a protracted and severe course as well as prolonged hospitalization in intensive care units with an unclear prognosis and burden on the health care system.

The author correctly poses the problem of diagnostic reliability and effectiveness of PCT and DNI in patients with abscesses and phlegmons of the head and neck of odontogenic and non-odontogenic origin in **the introduction** of the dissertation.

4. Characterization and evaluation of the dissertation work and knowledge of the problem

Yanko Yankov, MD shows in-depth knowledge of the subject being developed. Demonstrated skills for independent conduct of scientific research, made a detailed and in-depth review of the literature regarding laboratory indicators in the diagnosis of inflammatory diseases in the head and neck area and in particular procalcitonin (PCT) and delta neutrophil index (DNI).

The literature review is written in good scientific language and covers the main aspects of the objective. It ends with conclusions that confirm the need to develop and study the presented problem in detail, which would be important to optimize the clinical work in the departments of the maxillofacial surgery concerning inflammatory diseases.

The purpose and tasks correspond to the topic and content of the dissertation work. The goal is a logical conclusion from the literature review.

The realization of the goal was achieved through the implementation of five neatly formulated **tasks**:

1. Determination of the average values of PCT, DNI, CRP, WBC and neutrophils in the studied group of patients with head and neck abscesses, the subgroups of patients with odontogenic abscesses, with non-odontogenic abscesses and the control group of healthy people;
2. Determination and analysis of gender differences regarding the studied markers PCT, DNI, CRP, WBC and neutrophils in the studied population;
3. Determination and analysis of correlations between PCT, DNI, CRP, WBC and neutrophils in the studied group of patients with head and neck abscesses, in the subgroups with odontogenic and non-odontogenic abscesses and in the control group of healthy people;
4. Determination of cut-off diagnostic and reference values of PCT and DNI in the studied groups of patients with odontogenic and non-odontogenic abscesses of the head and neck;
5. Determination of sensitivity, specificity and predictability of PCT, DNI, CRP, WBC and neutrophils in the studied group of patients with odontogenic and non-odontogenic head and neck abscesses.

Sufficient material is presented for each of the tasks and methods for achieving reliable results and objective conclusions are described.

The study is prospective and includes 81 patients with head and neck abscesses (50 of them of odontogenic and 31 of non-odontogenic origin) for the period from July 2021 to December 2021 at the Clinic of Maxillofacial Surgery at the University General Hospital (UGH) "Sveta Marina" – Varna city.

Research **methods** are appropriately selected and accurately applied:

1. Clinical methods for examining patients with inflammatory processes of the head and neck
2. Venous blood collection procedure
3. Laboratory methods

- for CRP on biochemical analyzer "COBAS 6000" ("Hoffmann la Roche") by

immunoturbidimetric method with latex particles, and its numerical values were presented in mg/l;

- for WBC on hematology analyzer "ADVIA 2120" ("Siemens"), and its numerical values were presented in $N \times 10^9/L$;

- for neutrophils on a hematology analyzer "ADVIA 2120" ("Siemens"), and its numerical values were presented in $N \times 10^9/L$;

- for PCT on biochemical analyzer "ADVIA 1800" ("Siemens") by latex enhanced immunoturbidimetric analysis with reagent kit of "Diazyme Laboratories Inc", and its numerical values were presented in ng/ml;

- for DNI, the differential blood count is determined on an automatic 5 Diff hematology analyzer "ADVIA 2120" ("Siemens") and after its calculation, the results are presented in percentage (%).

4. Statistical methods and programs for statistical processing.

The obtained **results** are reliable and well analyzed.

The discussion of the results is done correctly and is well illustrated with graphs and tables.

The conclusions are formulated optimally and provide important information for clinical practice mainly regarding the accurate and timely diagnosis of inflammatory diseases in the head and neck area and hence the adequate surgical and medicinal approach.

5. Contributions and significance of the dissertation work

The main contributions of a scientific and applied nature in the dissertation development are the following:

1. For the first time in Bulgaria, PCT and DNI are used as markers in the management of odontogenic and non-odontogenic head and neck abscesses;
2. For the first time in Bulgaria, a correlation between PCT, DNI, CRP, WBC and neutrophils as markers of inflammation in odontogenic and non-odontogenic head and neck

abscesses was made;

3. Determination and follow-up of PCT and DNI in routine practice in patients suspected of odontogenic and non-odontogenic head and neck abscesses may lead to earlier diagnosis and more precise treatment of these diseases;

4. The introduction of DNI as a diagnostic marker of odontogenic and non-odontogenic head and neck abscesses has positive economic dimensions;

5. PCT and DNI cut-off values for the diagnosis of odontogenic and non-odontogenic head and neck abscesses were derived.

6. Personal participation of the doctoral student

The dissertation work shows that Yanko Yankov, MD possesses professional competence, knows modern specialized literature and demonstrates qualities and skills for independently conducting scientific research and obtaining real and reliable results. The conducted research and the resulting conclusions and contributions in the dissertation work are the personal work of the author.

The abstract is written on 71 pages, appropriately illustrated, and presents in a synthesized form the main structural components of the dissertation work.

Remarks:

1. The number of Bulgarian authors cited in the bibliography is too small.
2. The results could be presented by tasks.

Conclusion:

The work presented is an original scientific development, the personal work of the author, having contributions of a scientific-applied and confirmatory nature. Determination and follow-up of PCT and DNI in clinical practice in patients suspected of odontogenic and non-odontogenic head and neck abscesses can lead to earlier and precise diagnosis and timely and accurate treatment of these diseases, especially in comorbidity. The introduction of DNI

as a marker for the diagnosis of odontogenic and non-odontogenic head and neck abscesses would have positive economic dimensions. This would optimize the treatment of patients with acute or exacerbated inflammatory diseases of the head and neck in the departments of maxillofacial surgery.

Based on the prepared review and my personal impressions, I positively evaluate the dissertation work on the topic "**Procalcitonin and delta neutrophil index levels in the surgery of head and neck inflammatory diseases**", which covers the mandatory minimum requirements according to the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the terms and conditions for acquiring scientific degrees and holding academic positions of the Medical University – Varna city, and I give my positive vote for **Yanko Georgiev Yankov, MD** to acquire the educational and scientific degree "Doctor" in the scientific specialty "Surgery".

21.11.2022

City of Sofia

Prepared the recenzia:

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