

STATEMENT

From Prof. Dr. Irena Kostadinova, DMD, PhD, DSc, Clinic of Nuclear Medicine at Acibadem City Clinic University Hospital, Sofia, according to an Order № R-109-140 / 05.04.2022 of the Rector of MU-Varna, the Dissertation of Dr. Ivaylo Georgiev Hristov, on the topic: "One-photon emission computed tomography with $^{99m}\text{TcMDP}$ (methylene diphosphonate) of periimplant bone tissue in the recovery period after placement of intraosseous osseointegrable implants", PhD student in the scientific specialty: "Therapeutic Dentistry", in the field of higher education: 7. Healthcare and Sports, Professional field: 7.2. Dental Medicine, at the Department of "Periodontology and implant dentistry" - MU "Prof. Dr. Paraskev Stoyanov" - Varna.

Nowadays, dental implant treatment is growing rapidly, it fully restoring the patient's masticatory function and aesthetics. It is clinically important to achieve osteointegration of the implant for successful treatment, it can be traced and, if necessary, to support further treatment. Objective assessment of vascularization and osteogenesis of the implant can be reliably achieved with the help of three-phase bone scintigraphy, which is the most sensitive functional test. It can be used to visualize resorptive bone changes before the onset of clinical symptoms or CT changes. The additional tomographic examination to the planar two-dimensional scintigraphy - SPECT-CT, helps to accurately locate and specify the changes associated with the process of bone formation between the alloplastic material and the biological environment.

The aim of the study is to evaluate the role of hybrid imaging - SPECT / CT study with $^{99m}\text{Tc MDP}$ in the healing process of peri-implant bone tissue after placement of intraosseous osteointegrable implants.

From the point of view of the modern development of dental implantology, the proposed topic for the dissertation "Single-photon emission computed tomography with $^{99m}\text{TcMDP}$ (methylene diphosphonate) of periimplant bone tissue in the healing period after placement of intraosseous implants allow a detailed elucidation of the role of the method and the clinical benefit in assessing the integrity of the implant and monitoring the healing process in dynamics, comparing the data with CBCT and those of resonant frequency analysis.

The dissertation contains correctly structured 151 pages, contains indicative -11 tables, 26 figures, 30 photos and 7 appendices. Despite the limited data in the literature on that topic, the author includes in the dissertation a large literary reference, providing a detailed insight into the topic and achieving an expert opinion, which he expressed in the development, namely 402 sources, of which 9 in cyrillic and 393 in latin.

Ten patients were examined, with a total number of 23 implants. who underwent

patients - before implantation was performed CBCT with an originally created software algorithm for determining bone density using the average values of HU units . It was performed resonance frequency analysis for additional monitoring of the process of osseointegration.

The dissertation is accompanied by 3 real publications required by the Regulations of MU-Varna

The main contribution of the proposed work is methodological with the obtained results of the use of the hybrid imaging method SPECT-CT for evaluation of the osteoblast activity of the periimplant bone tissue in the healing period after placement of intraosseous osteointegrable dental implants are presented for the first time in our country.

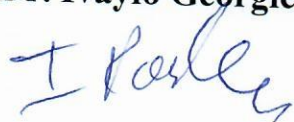
The author introduces an objective quantitative indicator for the assessment of osteoblast activity, namely an index of osteoblast activity. The method was found to be highly sensitive and non-invasive, which has prognostic value in terms of the success of the patient's implant treatment.

Successful therapy is associated with normalization of hyperfixation of the osteotropic radiopharmaceutical or bone metabolism on day 90, after an increase in osteoblast activity on day 30. The results are compared with those of the CBCT and it is found that the changes visualized on bone scintigraphy are earlier and may support, if necessary, further therapeutic approach. An original contribution of the work, not described in the literature, is the developed software algorithm for bone density in a predetermined bone volume. For the first time, a comparative evaluation of the resonance frequency analysis and SPECT-CT was performed and it was found that they complement each other in the evaluation of the process of osseointegration. It is recommended the author to continue to recruit patients and, summarizing the data, publish them in the international medical press.

Dr. Hristov was born in 1988. and graduated from a language high school in Vratsa. Subsequently, he studied and graduated as a dentist in 2013. with excellent success at MU-Varna. He has been a specialist in dental imaging since 2020. He is a doctor in the Department of Periodontology and Dental Implantology at the Medical University "Prof. Dr. Paraskev Stoyanov "Varna. Academic teaching load of 240 hours per year.

In conclusion, I believe that the presented dissertation, for the first time in our country examines the current application of conventional bone scintigraphy and hybrid imaging SPECT-CT with $^{99m}\text{TcMDP}$, in the assessment of peri-implant bone tissue in the recovery period after implantation. This topic is extremely relevant in current period of rapid development of dental implantology. There are original contributions made not only of national importance, but also those for international dental practice.

Due to the above mentioned, I strongly recommend the respected members of the Scientific Jury to vote positively for the educational and scientific degree "Doctor" to Dr. Ivaylo Georgiev Hristov.

A handwritten signature in blue ink, appearing to read 'I Kostadinova', written in a cursive style.

Prof. Dr. Irena Kostadinova, MD, PhD, DSc