

To the President of the Scientific Jury  
Designated by Order No. P-109-182/15.04.2022

of the Rector of MU-Varna.

## **REVIEW**

**by Prof. Dr. Rosen Gospodinov Kolarov, PhD,**  
**Medical University of Varna, Faculty of Dental Medicine, Department of Oral Surgery**  
on a dissertation for receiving a **doctoral degree**

**Sphere of higher education:** 7. Healthcare and Sports

**Professional field:** 7.2. Dental medicine

**Doctoral programme:** Conservative Dentistry,

**Author:** Dr. Aleksandar Ivanov Georgiev,

**Self-training PhD student**

**Department:** Conservative Dentistry and Oral Pathology,

**Subject:**

**"Impact of cardiovascular disease and diabetes on dental treatment"**

**Scientific supervisor.** Prof. Dr. Miglena-Eneva, Department of Conservative Dentistry  
and Oral Pathology, Varna

### **1. General presentation of the procedure and the PhD student**

The present review is prepared on the basis of the Order of the Rector of MU - Varna No. P-109-182/15. 04. 2022, with appointed Scientific Jury under the procedure for public defense of the described dissertation. The submitted set of paper and electronic materials are in accordance with Art. 24, para. 6 and Art. 30, par. 3 of the Regulations on the conditions and procedure for the award of scientific degrees and for holding academic posts in Republic of Bulgaria, Art. 68, par. 1 of the Regulations for the Development of the Academic Staff of MU-Varna and were provided to me within the legally established deadline.

The doctoral candidate has attached a total of 5 publications related to the topic of the dissertation, of which 3 were published in scientific journals and 2 presented at scientific forums.

All documents have been duly prepared and submitted.

## **2. Brief biographical data about the doctoral student**

Dr. Alexander Ivanov Georgiev, was born on 17. 08. 1989.

In 2008 he was admitted to the Faculty of Dentistry of the Medical University of Sofia.

He graduated in dentistry in 2014.

Since 2014 and until now, he has been working as a dentist at AIPDP I. G. Dental - Ltd.

From 2015 to 2018 he worked at the Specialized Hospital for Active Treatment of Maxillofacial Surgery - Sofia.

In 2019 acquired a specialty in Oral Surgery.

As of 2019 he has a Master's degree in Health Management from MU – Sofia

Dr. Georgiev has a total work experience of 8 years.

Dr. Georgiev is a member of:

- Bulgarian Dental Association (BDA)
- Association of Oral and Maxillofacial Surgeons in Bulgaria

He speaks English and German at a good level.

## **3. Relevance of the topic and expediency of the set goals and objectives**

The topic of the dissertation deals with a topical and important problem for dental science and practice. The aim is clearly formulated, the tasks are correctly defined and are performed with modern research methods.

Cardiovascular disease and diabetes play a significant role on the overall "health" of the human body. The impaired tissue trophicity resulting from these two diseases leads to an overall change in tissue function. The "rejuvenation" of many chronic diseases, including CVD and diabetes, is leading to their increasing prevalence in the population. The treatment of these diseases changes dynamically over time. On the other hand, treatment plans are constantly being improved and new drug groups are being introduced. Some of these medications may increase the risk of complications during certain manipulations. Such manipulations in particular are invasive dental manipulations, namely implantological and surgical treatment. It may be associated with additional surgical interventions such as tooth extraction, bone grafts, etc. , or it may be performed as a stand-alone invasive dental treatment.

Dental manipulations are mainly performed in outpatient dental care practices. In view of this, treatment standards and schemes should be appropriate to the nature of the work and equipment of this type of treatment facility. There is sufficient information in the literature both on the uneventful treatment of patients with these comorbidities and on the presence of more frequent and more severe complications in these groups of patients. It is important to derive workable regimens for adequate treatment of this type of patients.

Dr. Georgiev has made a thorough critical analysis of the literature, formulating the unsolved problems on the topic.

In his work Dr. Georgiev shows skills for independent scientific research.

On the basis of the analysis of the scientific researches carried out so far on the problem, the aim of the scientific work is logically deduced, namely:

**"To compare the success rate of invasive dental treatment in patients with cardiovascular disease, diabetic patients and healthy patients".**

The exposition is written in good scientific language.

#### **5. Methodology of the study**

The realisation of the objective is achieved through the implementation of four main tasks, namely:

1. To build a profile of the patient in need of invasive dental treatment in terms of age, gender and clinical health.
2. To study the success rate of invasive treatment in healthy patients.
3. To investigate the success of invasive treatment in patients with CVD and anticoagulant/antiaggregant therapy or anticoagulant/antiaggregant therapy.
4. To investigate the success of invasive treatment in patients with diabetes

Thus formulated, the tasks enable the goal to be proven.

The logical unit of study is invasive dental manipulation. It was performed in 95 patients, with a total of 325 invasive manipulations:

**Patient selection and study design:** The study included men and women divided into age groups according to WHO. Participants range in age from 18-44 to 75-89. There are no participants in the under 18 group and none in the over 90 group. Participants with complaints of loss of one, several, or all teeth, as well as those with impending loss of one, several, or all teeth, those who are to have missing teeth in the tooth row restored with implants, and those

who are to have invasive dental treatment were selected. Persons with mental illness are not included. Patients were divided into three conditional groups - clinically healthy, patients with CVD, taking antiaggregants or anticoagulants and diabetics. Those who are clinically healthy are considered to be free of comorbidities (detected earlier or before the interventions) and are not taking medication systematically - they are controls.

**Task 1** included 42 patients who underwent invasive dental treatment. Twenty-two (22) of the participants were female, 20 were male. Women predominate, but the difference is not statistically significant.

**In Task 2**, 83 manipulations were performed on 22 healthy control patients who reported no chronic diseases, such as systemic medication intake.

These patients also served as the "reference point" for treatment success rates for the research study. In these patients, no circumstances of a general nature are expected to lead to a change in the success of invasive treatment. In addition to the follow-up, a detailed analysis of blood tests was performed.

**In task 3**, 216 manipulations were performed on 20 patients with CVD who were taking systemic antithrombotic or anticoagulant medication. The surgical interventions were placement of dental implants and/or other invasive manipulations. According to the therapy in these patients, different modern treatment approaches are considered and their success rate is reported. As in Task 2, patients' blood parameters are reported in detail. Some of the indicators are examined according to the type of antithrombotic or anticoagulant medication taken.

**In task 4**, 125 manipulations were performed on 11 diabetic patients who were taking systemic medication to reduce blood glucose values. In this study, the patients were diabetics with good and moderate blood glucose control. There were no patients with poor glycaemic control as routine surgical interventions were not recommended in these patients.

The number of logical units (in this case, patients and invasive dental procedures performed) required for a clinical study for a PhD thesis are sufficient to formulate conclusions of good scientific value.

Clinical, paraclinical, therapeutic and statistical research methods have been used in this dissertation. Through the chosen methods, the aim was achieved and the set tasks were answered.

The clinical material selected for the fulfillment of the main aim and objectives is quite sufficient for the development of a dissertation.

**Units of observation:** dental patient, invasive dental manipulation, blood tests.

**The signs of surveillance are:**

- Gender and age of patients;
- Invasive dental treatment performed;
- Patients with CVD;
- Patients with diabetes;
- Patients with dental disease;
- Patients taking antiaggregants or anticoagulants.

**Time of observation:**

Patients were studied and treated between 2018 and 2021.

The observation site was implemented in the Outpatient clinic for individual practice for primary dental care I. G. Dental - Ltd.

The following methods of data analysis were used to perform the set tasks:

**Statistical methods for data analysis:**

Data were processed using Microsoft Excel programs. The significance level was taken as  $p \leq 0.05$ . Statistical methods used: The first phase of the statistical study consists of a descriptive analysis of all variables.

- The next step is to compare the continuous variables with respect to a categorical variable for the two populations (patients with comorbidities and a control group)
- Graphical analysis - for image visualization (Microsoft Excel)
- Alternative analysis - to compare variables and calculate percentages
- Correlation analysis - to assess the presence of a linear relationship between quantitative traits; calculate the correlation coefficient of variables and non-variables.
- Analysis of variance - to calculate standard deviation
- Determination of means, standard deviations, representative error
- Variables are compared in percentages.

**6. Characteristics and evaluation of the thesis:**

The dissertation contains 171 standard pages and is illustrated with 46 tables and 27 figures. There are 4 appendices. The bibliography consists of 172 sources, of which 4 in Cyrillic and 168 in Latin.

The results are comprehensively and correctly described, analysed and interpreted.

The dissertation concludes with conclusions based on the results, discussion and generalizations drawn from the study.

#### **7. Contributions and significance of the development for science and practice**

The following contributions of theoretical and scientific-applied nature are outlined in the dissertation work:

##### **Scientific contributions**

1. A thorough analysis of the epidemiological, etiological and clinical aspects of the treatment of healthy patients and those with cardiovascular disease and diabetes has been performed.

2. An analysis of the results of blood tests performed on patients with various underlying diseases has been performed, taking into account variability by sex and age groups.

##### **Contributions of an applied nature**

1. A protocol for treatment by invasive dental manipulation of patients with cardiovascular diseases and undergoing antithrombotic or anticoagulant therapy is proposed.

2. A protocol for treatment by invasive dental manipulation of patients with type 2 diabetes is proposed.

##### **Contributions of a confirmatory nature**

1. It has been confirmed that the treatment of patients on antithrombotic or anticoagulant therapy can be predictive and comparable to that of "healthy" patients if certain measures are followed.

2. It is confirmed that the treatment of patients with diabetes can be predictive and comparable to that of 'healthy' patients if certain measures are followed.

#### **8. Evaluation of the dissertation publications**

Five scientific publications are presented, including two contributions to scientific forums and three publications in scientific journals, D-r. Georgiev being the first author in all five of them, namely:

Participation in scientific forums:

1. Georgiev A. Implant treatment in patients with underlying diseases. 17th International Congress of ISLD, 10th Congress of BDLS and 2nd National Congress of BAOM, Plovdiv 6-8 June 2019

2. Georgiev A, Balcheva M. Surgical and implant treatment in patients with underlying diseases. 29th Annual Assembly of IMAB, Varna 09-12 May 2019.

#### Publications:

1. Georgiev A, Balcheva M. Invasive dental treatment in patients with diabetes type 2. Scripta Scientifica Medicinae Dentalis. 2021;7 (2):45-8
2. Georgiev A, Balcheva M. Patients with arterial hypertension - influence of medications on upcoming dental-surgical treatment. Varna Medical Forum. 2020;9(2):177-81 // Georgiev A, Balcheva M. Patients with hypertension - influence of hypertension therapy on the impending dental surgical treatment. Varna medical forum. 2020 Dec;9(2):177-81
3. Georgiev A, Balcheva M. Dental treatment and diabetes mellitus. Medinform J.2020 Aug;7(2):1216-1222. ISSN 2367-6795

They have been published in prestigious journals, and the results obtained in them satisfy quantitatively and qualitatively the legal requirements for a dissertation.

#### **9. Personal participation of the doctoral student**

I accept the research and observations of patients and the resulting conclusions and contributions in this dissertation as the author's personal work.

#### **10. Abstract of a dissertation**

The abstract contains 58 pages, illustrated with 26 figures and 9 tables. It correctly reflects the essence of the study and the results achieved in the dissertation. The conclusions drawn are reflected in it. Изготвен е съгласно изискванията на the Rules of Application of the Academic Staff Development Act in the Republic of Bulgaria and the regulations of MU - Varna. Reflects the content of the dissertation.

#### **11. Critical remarks and recommendations**

The set of dissertation materials provided to me are complete and in compliance with the the Rules of Application of the Academic Staff Development in the Republic of Bulgaria and its implementing regulations, as well as the Regulations of MU - Varna. I have no comments and recommendations.

#### **12. Personal impressions**

Dr. Alexander Georgiev is built as a dentist with a strong clinical mindset. He possesses in-depth theoretical knowledge and professional skills in his specialty. The text provided to me shows a thorough knowledge of the problem and gives me reason to accept it as his personal work.

#### **13. Recommendations for future use of the dissertation contributions and results**

I recommend Dr. Georgiev to shape and publish his dissertation work as a monograph. This would make his work more accessible to colleagues working on this problem on a daily basis.

## CONCLUSION

The theme of the dissertation chosen by Dr. Aleksandar Ivanov Georgiev, namely: Impact of cardiovascular disease and diabetes on dental treatment, addresses a significant problem in the dental practice and science. In this regard, the theme is significant and well-chosen.

The literature review is comprehensive and gives a clear idea of the current state of the issue under consideration. It ends with a critical analysis, which is a good basis for the research carried out.

The clinical material and the research carried out are of interest for dental practice and science. I consider that the results obtained in the dissertation, their interpretation, as well as the presented publications related to it are the author's personal work.

The dissertation shows that the doctoral candidate Dr. Georgiev **possesses** in-depth theoretical knowledge and professional skills in the specialty Oral Surgery, **demonstrating** competences and skills for conducting independent research.

Based on the above stated, I consider that the requirements set in the Act for the Development of the Academic Staff and its Implementation Rules as well as in the regulations of the Medical University of Varna are met. The presented materials and dissertation results are in **full** compliance with the specific requirements of the Medical University Varna.

**In conclusion:** Hereby, I confidently give my positive opinion of the dissertation themed **Impact of cardiovascular disease and diabetes on dental treatment**, and I will cast my **positive vote** for awarding **doctoral degree** in the scientific speciality **Conservativ Dentistry** to **Dr. Aleksandar Ivanov Georgiev**.

05 .06. 2022

Reviewer: .....



(Prof. Dr. Rosen Gospodinov Kolarov, PhD)