To the Chairman of the Scientific Committee,
appointed by Order № P-109-232 /20.05.2025 г.
of the Rector of the Medical University

"Prof. Dr. P. Stoyanov", Varna

REVIEW

by Prof. Dr. Maria Angelova, MD,Head of the Department of Obstetrics and Gynecology,Faculty of Medicine, Trakia University,on the dissertation entitled: **"CO_2 Laser Treatment of Urogynecological Conditions"**for awarding the educational and scientific degree "Doctor" in the scientific specialty Obstetrics and Gynecology, Department of Obstetrics and Gynecology, Medical University "Prof. Dr. P. Stoyanov" – Varna ,Author: **Dr. Darina Alexieva Davidova**

Dr. Darina Alexieva Davidova is a specialist in obstetrics and gynecology with more than 10 years of professional experience in clinical and outpatient gynecology, teaching, and scientific work. She was born on 17.09.1988 in the town of Krumovgrad and currently lives and works in Burgas. She completed her master's degree in medicine at the Medical University – Plovdiv (2007–2013), and subsequently obtained her specialization in obstetrics and gynecology (2014–2018) at the same university. In 2019–2020, she furthered her qualifications with a second master's degree in health management at the Higher School of Agribusiness and Regional Development – Plovdiv. Her professional career has included positions at Pazardzhik General Hospital, University Hospital "Deva Maria" – Burgas, and "New Life" Medical Center – Burgas, where she currently practices as an obstetrician-gynecologist. Since 2021, she has also been a teaching assistant at the University "Prof. Dr. Asen Zlatarov" – Burgas, where she conducts classes in obstetrics and gynecology.Her scientific interests focus on innovative technologies in gynecology, particularly the treatment of urogynecological conditions with CO_2 laser. The topic of her dissertation, **"CO_2 Laser Treatment of Urogynecological Conditions,"** has been the subject of several scientific publications, including in the *Black Sea Journal of Medicine and Public Health* and *Medical Review*. Her research also includes topics such as stress urinary incontinence, polycystic ovary syndrome, infertility prevention, and consequences of cesarean sections.

Dr. Davidova has completed specialized courses in colposcopy, hysteroscopy (Level I), and ultrasound in obstetrics and gynecology (Level I), and is certified in the use of CO_2 laser in gynecological practice.

She is an active participant in numerous national medical forums and conferences, including the National Conference on Innovations in Obstetrics and Gynecology, the National Public

Health Conference, the Autumn Medical Forum, and the National Obstetrics Conference. She has presented papers on laser therapy, the early postoperative period, assisted reproduction, and the risks of cesarean delivery.

The dissertation submitted for review by **Dr. Darina Alexieva Davidova** is written in literary Bulgarian and consists of 147 pages, including 86 figures, 1 table, and 3 appended survey questionnaires. It cites 202 references, 9 of which are from Bulgarian authors and 193 from international sources. The format complies with the requirements for a scientific work.

Relevance of the Topic

In her dissertation, Dr. Davidova addresses a topic of high relevance and clinical significance for modern gynecological practice. Urogynecological disorders, particularly stress urinary incontinence (SUI), significantly impact women's quality of life by affecting physical health, emotional well-being, and social adaptation. Despite their prevalence, many cases remain undiagnosed or inadequately treated due to stigma, lack of awareness, or fear of invasive procedures. In this context, CO_2 laser therapy emerges as an innovative, minimally invasive, and safe therapeutic approach with proven benefits for urogenital structure and symptoms. The study advocates for the implementation of modern technological solutions in gynecological practice and emphasizes the role of personalized, patient-friendly treatments for chronic urogynecological conditions.

Evaluation of Literature Review

The literature review spans 50 pages. The author demonstrates a clear effort to gather, summarize, and analyze key data from a broad body of existing research. A sufficient number of both Bulgarian and international authors are cited, indicating a thorough exploration of contemporary scientific literature. The review is logically structured, professionally written, and has substantial academic value.

Objectives and Tasks

The dissertation's objective is clearly defined and logically derived from the literature review. It is broken down into eight specific and well-justified tasks. Both the aim and the tasks are precise and realistic, highlighting the author's solid research preparation. The formulation shows methodological consistency and scientific focus.

The research tasks include:

1. To analyze the potential of CO_2 laser treatment in women with SUI during reproductive and climacteric periods
2. To assess the quality of life of women with SUI
3. To evaluate the biomedical outcomes of treatment in women with SUI
4. To examine the psychological and social impacts of treatment in women with SUI
5. To identify predictive markers of treatment success and effectiveness in specific patient profiles

6. To analyze treatment results using CO_2 laser in SUI cases
7. To assess the continuity of effectiveness after vaginal CO_2 laser procedures
8. To confirm the safety of CO_2 laser therapy in patients with urinary incontinence

Evaluation of Materials and Methods

This chapter spans 3 pages. The study group consists of 107 patients. The methods applied are appropriate, up-to-date, and scientifically valid, providing a reliable basis for evaluating the therapeutic effects of CO_2 laser treatment in SUI and other urogynecological conditions.

The study was conducted over two years (January 2022 – January 2024). The average age of the participants was 54 ± 6.16 years, with a range from 38 to 72 years. The patients were divided into three age groups: 18–40, 41–63, and over 63. Participants were also categorized by BMI into four groups. Vaginal delivery was reported in 94 women (87.85%), while 13 (12.15%) had cesarean sections.

The methodological approach and statistical tools are appropriate and logically applied, ensuring the credibility of the results.

Own Results and Discussion

The results are presented across 68 pages and divided into five sections.

The candidate provides well-structured and illustrated findings. Each section includes detailed discussion, comparisons with existing data, and the author's own interpretations. This originality is notable, as such research has not previously been conducted in Bulgaria.

The results deserve special attention, as this is the first doctoral dissertation in the country to explore the use of a globally innovative, minimally invasive method for SUI treatment as an alternative to conventional therapies.

Evaluation of Conclusions and Contributions

The dissertation presents 11 conclusions—exceeding the number of initial tasks, which is justified given the complexity of the issue. The conclusions reflect a deep and precise analysis. Contributions are clearly articulated—five original and five confirmatory—each with solid theoretical and practical value. The dissertation reflects the author's strong scientific engagement and contribution to modern urogynecological practice through an innovative, minimally invasive approach.

The candidate provides the following recommendations for clinical use of CO_2 laser in SUI treatment:

1. Careful patient selection leads to better therapeutic outcomes with CO_2 laser treatment.
2. Use consistent frequency and power settings for all three sessions—minimum 10 mJ energy and 10% density.
3. Maintain a 4-week interval between procedures.
4. If results after 3 sessions are unsatisfactory, a 4th and 5th session may be administered, given the absence of risks and side effects.

Conclusion

Dear colleagues of the Scientific Committee, I consider the dissertation of Dr. Darina Davidova to be a thorough and valuable scientific work with significant theoretical and practical contributions. The topic is highly relevant, the research structure is logical and coherent, and the tasks are clearly defined and successfully achieved. The results are reliable, reproducible, and applicable in clinical practice. I firmly believe the dissertation meets all criteria for awarding the educational and scientific degree "Doctor."

I recommend that the esteemed Scientific Committee vote in favor of awarding the degree "Doctor" in the specialty of "Obstetrics and Gynecology" to Dr. Darina Alexieva Davidova.

Date: 09.06.2025

Prof. Dr. Maria Angelova, M
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