

REVIEW

By Assoc. Prof. Dr. Bogdan Mladenov, MD

UMHATSM "N.I. Pirogov"

Department of Pediatric Anesthesiology and Intensive Care,

on the dissertation of Dr. Dimcho Georgiev Gendzheliev, titled:

"POTENTIATING ADJUVANT TECHNIQUE IN PERIPHERAL NERVE BLOCKS OF THE UPPER EXTREMITY"

for the award of the educational and scientific degree "Doctor"

Academic advisor: Prof. Dr. Stoyan Milanov, MD

Form of doctoral program: Free

Doctoral program: Anesthesiology and Intensive Care

Presentation of the doctoral candidate and procedure:

The opinion is presented with a set of documents in accordance with the Rules for the application of the Law for the development of academic staff in the Republic of Bulgaria. Dr. Dimcho Georgiev Gendzheliev was born in 1988 in Sofia and graduated from the Medical University of Sofia in 2013. He began his professional career at UMHATSM "Pirogov" in the Department of Anesthesiology and Intensive Care. He acquired the specialty of Anesthesiology and Intensive Care in 2018. He is a member of the Bulgarian Society of Anesthesiologists. He speaks English.

The dissertation consists of 110 pages, illustrated with 29 figures and 35 tables. The bibliography includes 160 references. The structure of the dissertation is precise and meets the accepted formatting criteria.

Relevance of the Topic of the Dissertation

The presented work addresses a relatively innovative and rapidly developing field in anesthesiology practice – regional techniques under ultrasound control and adjuvants for local anesthetics. The topic of the dissertation fully aligns with the professional experience and scientific interests of the candidate, as well as with the profile of the scientific unit. The scientific review clearly defines the significance of the problem and the current state of knowledge. The available methods for regional anesthesia in trauma patients are discussed in detail, with their advantages and disadvantages. The literature review is well-structured, terminologically precise, and organized. It outlines the specifics of the problem well and points towards the proposed hypothesis and goal of the work. The topic is highly relevant and promises new information in a field where there are very few structured recommendations.

Methodology

The goal set by the doctoral candidate is clearly defined and concerns the evaluation of the role of the potentiating adjuvant technique in peripheral nerve blocks of the upper extremity.

Given this goal, the tasks are optimally structured and aim to study the onset speed of motor and sensory block, as well as the prolongation of these effects with the use of different adjuvants with local anesthetics. Only task 5, which involves measuring the time required for performing different regional blocks, does not align particularly well with the set goal. The final task for the doctoral candidate is to develop a practical protocol for the use of adjuvants in the clinical practice of regional anesthesia. The study is prospective, and the inclusion and exclusion criteria are clearly defined. The measurement protocol is clear and consistent. The number of participants in the predefined groups is adequate for the desired effects. The group sizes also ensure homogeneity in terms of demographic characteristics, types of pathology, and different regional techniques. From a methodological standpoint, it is notable that one of the adjuvants is administered systemically intravenously, rather than perineurally, like the other molecules. This choice is well-motivated and discussed in the review, considering the precipitation of dexamethasone with ropivacaine and the risks that follow.

Given the amount of gathered information, it would have been interesting and useful to explore the difference in the duration of the effect depending on whether patients received sedation, as sedation itself is also an adjuvant.

Another interesting dependency could be explored between the type of regional technique (axillary, supraclavicular, and interscalene blocks) and the use of adjuvants. The brachial plexus changes its structure from proximal to distal, and the diffusion of different molecules through nerve structures also changes.

Hypothetically, diffusion and the onset speed of effect for certain molecules would be greater in proximal blocks. It would have been interesting to perform a subgroup analysis in this direction, and with the gathered data, this remains a potential for future research.

The choice of statistical methods is correct and precise, objectively reflecting the study's findings.

Evaluation and Characteristics of the Dissertation and Contributions

The chosen methodology successfully demonstrates the applicability and safety of adjuvants in regional anesthesia. The conclusions are well outlined and strictly formulated. The scientific contributions have a good practical and innovative character. The most valuable aspect of the study is that it brings a significant amount of new information in a rapidly developing field.

Publications and Personal Contribution of the Doctoral Candidate

The doctoral candidate's publications and participation in scientific events are included. This defines the real contribution of the doctoral candidate to the work, with the results, contributions, and achievements being his personal authorship.

Conclusion

The presented dissertation titled "POTENTIATING ADJUVANT TECHNIQUE IN PERIPHERAL NERVE BLOCKS OF THE UPPER EXTREMITY" contains scientific-applied results and contributions with innovative character on a current and debatable scientific issue. The presented materials and dissertation results fully meet the requirements established by the Law for the Development of Academic Staff in the Republic of Bulgaria. On these grounds, I give a positive assessment and recommend to the honorable jury to award Dr. Dimcho Georgiev Gendzheliev the scientific and educational degree "Doctor."

10th December, 2024

City of Sofia

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Assoc. Prof. Dr. Bogdan Mladenov, MD