

Military Medical Academy
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POSITION

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ABOUT: PhD thesis to obtain an educational and the scientific degree "PhD" in the scientific specialty" Anesthesiology and intensive care" on the topic: "ULTRASOUND – GUIDED SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK IN CHILDREN ", written by ALBENA SASHOVA ATANASOVA, MD

The PhD thesis submitted for review on the topic: "ULTRASOUND – GUIDED SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK IN CHILDREN " is written on 136 standard typewritten pages with the following content – Introduction 2 pages; literary review - 29 pages; purpose and tasks - 2 pages; material and methods – 22 pages; results and discussion – 51 pages; conclusions, recommendations, outcome - 4 pages; contributions – 3 pages; appendix - 3 pages. The PhD thesis is well illustrated with 27 tables and 24 figures, graphs and photographs. The references contains 103 literary sources, of which 89 are in Latin and 14 in Cyrillic.

ACTUALITY OF THE SUBJECT

The development of modern anesthesia and analgesia lead to an increasingly widespread advocacy of regional techniques as a means of adequate analgesia. Regional nerve block is still challenging to perform in children due to the difficulty of patient feedback and cooperation, as well as the specific emotionality of this group of patients. Peripheral regional nerve blocks have an excellent benefit/risk ratio, both in adults and in children, leading to an increasing need for familiarization, development, and application of this technique.

Unpleasant pain stimulus in pediatric patients can lead to altered pain sensitivity, neuroanatomical and behavioral changes that could even be long-term in their effects. Local anesthetics have been shown to modify the neuroendocrine stress response, provide long-term postoperative analgesia, provide faster recovery, and therefore may shorten hospital stay and accelerate discharge. The paucity of randomized control trials in children compared to adults necessitates that such studies be performed to allow a correct analysis of the advantages, risks, and possibly disadvantages of regional techniques in children.

LITERATURE REVIEW

Dr. Atanasova has conducted a thorough study of the literature sources on the problem, with a priority study of publications from the last 10 years. Epidemiological data on fractures in children were reviewed and literature data indicated that the most common fracture among pediatric patients is that of the upper extremity. It is this group of patients that is the subject of the study. Dr. Atanasova presents the anatomical features in detail features of the brachialis plexus and a historical review of the development over the years of this technique is made. Various brachial plexus block approaches, their advantages and disadvantages, and the dangers and complications inherent in each are discussed. This part of the literature review is extremely useful with the information collected and analyzed by Dr. Atanasova and can be used as a compendium for this type of block.

The Bulgarian experience was also examined, and although there are no precisely formulated conclusions from the literature review, the insufficient publications in the Bulgarian literature lead to the need for a wider and deeper examination of the supraclavicular brachial plexus block technique in children. This dissertation work aims to increase the applicability, practicality and usefulness of the technique in anesthesiology practice, as well as the development of a methodology and protocol for its implementation.

As a remark, I would note the lack of conclusions from the literature review. However, the main purpose of the review is to present the facts and arguments known to date, pros and cons the solution of a given problem, to present still unclear and controversial points, so that the dissertation student can find her place and directly her attention where there is not yet definitive decision. Otherwise, the goal set by the dissertation student is not sufficiently argumentative and seems self-serving and only confirmatory of a given problem.

AIM AND TASKS

The aim of Dr. Albena Atanasova's PhD thesis is to study and evaluate the effectiveness of anesthesia during ultrasound-guided supraclavicular block of the brachial plexus in children undergoing surgery for a arm, diaphyseal, or proximal forearm fractures.

For the realization of this goal, the dissertation student has set herself six tasks, which I consider to be adequate and properly structured.

MATERIAL AND METHODS

The clinical study is prospective for the period 01.2017 - 04.2021. and was performed at the Clinic for Pediatric Anesthesiology and Intensive Care at the "N.I. Pirogov" University Hospital for Active Treatment and Emergency Medicine - Sofia. Inclusion and exclusion criteria are clear and well presented. 60 patients aged 3-17 years, undergoing surgical treatment for fractures of the proximal, diaphyseal or distal arm, proximal or diaphyseal forearm, were included. The patients were randomly divided into two groups - experimental group A (n=30) - with light or deep sedation and supraclavicular brachial plexus block under

ultrasound guidance and control group B (n=30) - with general anesthesia with standard intravenous, intraoperative opioid analgesia.

The PhD student presented in detail the equipment and methods for performing anesthesia in both groups of patients. The fact that the photo materials are author's makes a good impression.

The protocols for the clinical observation of the patients are presented in detail, which include physical, clinical indicators and several pain assessment scales.

The specialized statistical package SPSS (Statistical Package for the Social Sciences) version 20.0 was used to process the survey data using a wide range of methods.

RESULTS

The results of the study are presented by Dr. Atanasova in a separate chapter. The most common reason for hospitalization and surgical treatment of the upper extremity in children in the clinic is fracture of the distal arm, followed by diaphyseal forearm. No statistically significant differences were found by Fisher's Exact test on demographic indicators, and overall the demographic characteristics of the two groups were comparable and indicated that they originated from a common population.

Indicators related to anesthesia in the perioperative period, such as time to perform anesthesia, duration of operative intervention, hemodynamic stability of the patient - assessed by dynamics in pulse rate and blood pressure every 10 min, as well as the patient's awakening time, were examined and analyzed.

In the postoperative period, the following criteria were evaluated and compared - pain intensity in the recovery room according to the VAS scale, numerical scale, and behavioral FLACC scale, as well as on the 1st, 3rd, 6th, 12th and 24th postoperative hour.

The total amount of NSAIDs and opioids used in the experimental and control groups, as well as the presence of anesthesia complications, such as nausea and vomiting, were recorded and analyzed.

DISCUSSION

The discussion of the results is in a separate chapter, which the PhD student has structured analogously to the results chapter. An analysis of the data, a comparison with the sources presented in the literature review, and clarifications are presented. In the postoperative period, patients with supraclavicular brachial plexus block report significantly lower levels of pain and discomfort. The reduction of unpleasant experiences and psychological comfort in the hospital environment are important for the labile childhood. Providing adequate analgesia, not requiring frequent use of medication, as well as significant mobility, due to the reduction of unpleasant sensory sensations in the operated limb, is a favorable prerequisite for a possible reduced hospital stay and a significantly earlier start of rehabilitation and, accordingly, a faster recovery to normal life.

CONCLUSIONS

Based on the results and the discussion, Dr. Albena Atanasova draws 8 main conclusions:

1. Ultrasound-guided supraclavicular brachial plexus block provides adequate analgesia both intraoperatively and postoperatively in the pediatric population.
2. The supraclavicular block (SCB) creates conditions of intraoperative hemodynamic stability with minimal changes in heart rate and arterial pressure.
3. Ultrasound-guided supraclavicular brachial plexus block requires a longer time to perform anesthesia, but this is compensated by a significantly faster awakening, faster removal from the operating room, faster recovery of consciousness and reflexes, and accordingly by -rapid postoperative initiation of feeding and fluid intake, important in the pediatric population.
4. By echographic monitoring of the regional blockade, the amount of LA injected can be significantly refined, as well as trauma to anatomical structures can be avoided.
5. After SCB of the brachial plexus, patients rate the levels of post-operative pain significantly lower, compared to patients on intravenous analgesia.
6. After a supraclavicular block, parents appreciate significantly greater comfort and calmness in children.
7. Significantly less use and need of painkillers after SCB under ultrasound guidance.
8. Supraclavicular brachial plexus block had lower rates of postoperative nausea and vomiting compared to the general anesthesia group.

The conclusions are in accordance with the tasks set and follow the obtained results and the discussion. They are clear, precise and well worded. I accept the conclusions without objection.

EVALUATION OF CONTRIBUTIONS OF THE PHD THESIS

Dr. Atanasova offers 3 contributions from her PhD thesis of a scientific-theoretical and 4 scientific-applied nature. I agree and accept the presented contributions. They have a high scientific and applied value. The PhD thesis has a decidedly scientific and scientific-applied nature with real possibilities for using the obtained results in clinical practice.

EVALUATION OF PhD PUBLICATIONS

Dr. Atanasova has enough publications related to the topic of the PhD. The results of the studies have been presented at national and European congresses.

PERSONAL PARTICIPATION OF THE PhD STUDENT

The planning and implementation of the study, the shaping of the overall design, the photographic material and the statistical processing of the results is entirely the personal merit of the PhD student.

ABSTRACT

The abstract is comprehensive and contains the main components of the PhD thesis. It is presented in 55 pages, made according to the requirements and reflects the main results

achieved in the PhD thesis. The exposition is tight, specific, richly and qualitatively illustrated with figures and tables.

CRITICAL NOTES AND RECOMMENDATIONS

I have no critical remarks on the overall thesis work. The admitted technical and grammatical inaccuracies are minor and few in number and do not detract from the value of the PhD thesis.

CONCLUSION

The presented PhD work of Dr. Albena Sashova Atanasova contains important scientific and scientific-applied results and fully meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation and PPZRASRB. The topic of the PhD thesis is original, unexplored in Bulgaria. The contributions to the development are of a scientific-applied nature and would lay the foundations for a more optimal application of regional anesthesia techniques in children.

I believe that in the PhD thesis of Dr. Albena Sashova Atanasova, developed potential of the PhD student for the synthesis and analysis of scientific information, the ability to build scientific hypotheses and summerize conclusions, as well as in-depth theoretical knowledge and professional skills in the scientific specialty "Anesthesiology and intensive care".

All of the above gives me a reason to accept Dr. Albena Sashova Atanasova's PhD thesis as a fully completed up-to-date scientific development with significant scientific results. Therefore, I give my positive assessment and with conviction I invite the members of the esteemed Scientific Jury to vote for awarding the "PhD" to Dr. Albena Sashova Atanasova in the speciality program in "Anesthesiology and Intensive Care".

10.11.2022

Sofia

Prof. E.Odiseeva,MD, PhD

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