

POSITION

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With reference to: dissertation work for the acquisition of educational and scientific degree "Doctor" (Ph.D) in scientific specialty „Anesthesia and Intensive Care Medicine“ on topic „**APPLICATION OF POPLITEAL NERVE BLOCK IN LOWER LEG INJURIES IN PEDIATRIC PATIENTS**“ by doctoral student doctor Elena Toncheva Ivanova

The dissertation work „APPLICATION OF POPLITEAL NERVE BLOCK IN LOWER LEG INJURIES IN PEDIATRIC PATIENTS“ presented for a review is written on 144 pages and consists of: Introduction- 2 pages; Literature Review- 38 page; Aim and tasks- 2 pages; Materials and methods- 15 pages; Results- 18 pages; Discussion (analysis and evaluation of results)- 30 pages; Conclusion, closure- 4 pages; Scientific contributions- 3 pages; Protocols- 9 pages. The dissertation is traditionally structured following adequate distribution and volume of different chapters and sections.

The dissertation work presents 32 figures, 36 tables, 1 protocol, 1 cards for following a patient undergoing peripheral regional block, 2 survey cards.

Bibliography contains 2022 literature sources, 14 Bulgarian authors and 188 foreign authors. Most of them are late publications in the past 10-15 years.

ACTUALITY OF THE TOPIC:

Regional anesthesia occupies an increasingly large part of the pediatric anesthesia nowadays. The insufficient randomized controlled studies in children compared to those in adult patients lead to the need to process such researches which will allow correct analysis of the advantages, risks and potential disadvantages of these techniques in pediatric patients. Some of the benefits of pediatric regional

techniques includes reduced use of opioids and the related complications, such as vomiting and nausea, reduced risk of respiratory complications and mostly the postoperative analgesia which allows opioid sparing pain control.

Regional anesthesia is used more and more as a part of the multimodal approach of analgesia being a relative alternative of conventional opioid analgesia. The opportunity for early rehabilitation, early dehospitalization, especially after one day surgery, reduced hospital stay, turns regional anesthesia in economically preferable.

I personally would add the reduced risk of malignant hyperthermy which happens predominantly in pediatrics.

Although the feedback patient- operator could be often lost in the process of performing regional blocks stating questions about the safety of the technique, prospective and retrospective studies support the idea of performing regional anesthesia under general anesthesia as a safe method. All those issues turn this topic into very up to date one especially regarding the lack of such studies in Bulgaria.

LITERATURE REVIEW

Doctor Ivanova has done a sufficient study over literature sources, concerning the topic and most of the research is concentrated on publications over the last 10 years. Literature review reveals that most common pediatric fractures of leg are those of lower leg. This is the subject group of the dissertation study because the insufficient data in the Bulgarian literature leads to the necessity of wider and deeper research over the method popliteal regional nerve block for lower leg fracture analgesia. This dissertation work aims improving practical use of the technique in anesthesia practice, as well as developing methodology and protocol for performing the regional block. As a remark I may point out the lack of conclusions out of the literature review. This is the main goal of the literature review, to present the well know facts and arguments about the solution of some problem, to present some still unclear and questionable issues in order for the doctoral student to find his/her place and concentrate his/her attention where there is still no certain solution. Otherwise the goal set by the doctoral student is not enough reasoned and seems self- serving and with only confirming character.

AIM AND TASKS

Doctor Ivanova set as an aim of the dissertation work: To follow and analyze the effectiveness of pain relief by US- guided popliteal nerve block in lower leg fractures in pediatrics and to compare those results with classical conventional intravenous analgesia.

To solve this aim, doctor Ivanova sets certain tasks:

1. To study lower leg fracture characteristics.
2. To assign indications and contraindications for performing US-guided popliteal nerve block in lower leg fractures.
3. To follow up and estimate the effect and satisfaction of the technique- subjective and objective evaluation.
4. To estimate, evaluate and follow intraoperative effect and early and late postoperative effects.
5. To suggest and implement protocol for performing and evaluating US-guided popliteal regional nerve block.

MATERIALS AND METHODS

There are 108 patients for e 2years period (2018-2020) divided in two groups: Group A, 35 patients (32.4%) treated with regional nerve block- popliteal nerve block and group B 73 patients (67.6%), who received general anesthesia and classical intravenous analgesia with standard doses NSAIDs – paracetamol combined with opioid- tramadol. It's unclear how the patients were divided into the groups- sporadic or following strict criteria (probably regional anesthesia rejection, but this remains unclear). There is a follow up concerning time for performing the different anesthesia techniques, hemodynamic stability, postoperative pain according unified pain scoring scales and subjective patient feedback. The evaluation of postoperative pain is done regularly first in the operating room, then in recovery room and afterwards- in the Department of Pediatric Traumatology on 1st, 3rd, 6th, 12th, 24th and 48th postoperative hours. The follow up, registration, analysis of all data is performed by the author of the research.

RESULTS AND DISCUSSION

In this section doctor Ivanova present analysis of the results from the intra- and postoperative indicators. Clinical groups are very heterogenous regarding age which reveals statistically significant variabilities. The methodology is very detailed presented until the moment of presentation of clinical cases in group A and group B. In this part there is a lack of information about when and where the regional technique is performed in the case of group A example.

There is analysis of the time needed for performing regional anesthesia and general anesthesia, stay and discharge in and from recovery room, analgesia during and after surgery, possibilities of early rehabilitation and dehospitalization of patients.

In the course of her study, doctor Ivanova presents proves in favor of ERAS (Enhanced Recovery After Surgery program) in the patients group treated with US- guided popliteal nerve block:

- Three times (in minutes) reduced stay in operating room in group A.
- Two times (in minutes) reduced stay in recovery room in group A.
- A total of over one third (36.28%) of shorter stay in the Clinic of Pediatric Anesthesia, regarding the anesthesia itself for patients in group A.
- 100% opioid free days for the postoperative period for all patients in group A.
- 94.28% completely pain free patients in group A for the whole postoperative time (48h).

Popliteal nerve block covers intra- and postoperative pain, eliminates general anesthesia and opioid use, minimizes the need of postoperative analgetic therapy, enhances rehabilitation, reduces the mean hospital stay after surgery (dehospitalization). All of the above leads to better patients satisfaction and reduced hospital expenses.

A point of interest is focused on the pediatric patients with lower leg fractures who need surgical treatment in the year after completing the presented study. This data clearly shows the effect of one correctly analyzed study with well claimed and proved results. In the course of just one calendar year the ratio of peripheral regional blocks significantly dominates over general anesthesia. Amongst 60 patients, 30 were treated with US-guided popliteal nerve block according to the described methodology, 19 were treated with neuro-axial anesthesia- spinal block, and only 11 patients received general anesthesia followed by intravenous NSAIDs and opioids for postoperative analgesia. In general, regional anesthesia dominates over general anesthesia in the cases of surgical treatment of lower leg fractures. Less than 1/5 of the patients received general anesthesia and over 80% are treated with regional blocks.

On the grounds of processed analysis and achieved results, doctor Ivanova draw 5 essential conclusions which are clear and accurate.

The doctoral student suggests five contributions with original character, 4 with practical character, and several with confirming character which I accept with no special remarks although some of them duplicates.

The dissertation work is written in correct Bulgarian language with clear and accurate presentation. I have serious remarks about the design. There are some misspells, some incorrect sentences and some lack of grammatic elements such as verb and subject, use of different paragraph sizing. This forms a feeling of fast written dissertation amongst all other author agendas. This is a serious

recommendation for doctor Ivanova to be more precise and orderly in the exposition.

Personal contribution of the doctoral student in the research and results is indisputable. Authorship is undoubtful.

The Summery of the dissertation work clearly and accurately represents its content, results and contributions.

Doctor Ivanova provides sufficient number of publications related to the dissertation topic. The results of these researches are presented during National and European congresses.

CONCLUSION

Regardless my critical remarks, my overall valuation for the presented for review dissertation work is that this dissertation has all required qualities for obtaining educational and scientific degree „Doctor“ and it meets the legal regulations for development of the academic committee in Republic of Bulgaria.

An up-to-date and independent scientific study was conducted in which significant scientific results were obtained.

On the basis of the all above-mentioned characteristics, there is a reason for me to give a POSITIVE VALUATION and to VOTE POSITIVE for awarding doctor ELENA TONCHEVA IVANOVA with educational and scientific degree „Doctor“.

10.11.2022

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