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POST OPERATIVE EVALUATION OF CHILDREN OPERATED WITH SPINAL ANESTHESIA

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ABSTRACT

Although it has already been recognized that spinal anesthesia provides sufficient surgical anesthesia and analgesia in pediatric appendectomies, the method is rarely used. This study aimed to evaluate the efficacy and the results of the method in children who underwent appendectomy under spinal anesthesia. In this study, the records of the patients, who underwent appendectomies under spinal regional block anesthesia between February 2017 and September 2017 due to a diagnosis of uncomplicated appendicitis, were reviewed retrospectively. The patient files, the patients' examination findings before the anesthesia, data on the insertion of the catheter for spinal anesthesia administration, the duration of time passed until achieving the block, the emergent need for an additional general anesthesia, duration of surgery, the need for additional medication, and the development of complications either during the surgical procedure or after the surgery were evaluated. A total of 50 patients were included in this study. Of these patients, 29 were males and 21 were females. The spinal anesthesia was successfully achieved at the first attempt in 47 patients and at the second attempt in 3 patients. The mean duration of time for the development of a complete block was calculated to take place at a mean of 8.3 ± 1.2 min. The mean duration of time for the operation to be accomplished was found to be 43.6 ± 4.8 min. Only 2 patients developed the complaints of hypotension, dizziness, and vomiting due to spinal anesthesia. Their symptoms regressed by medical treatment in 24 hours. In conclusion, the sensory and motor blocking features of the spinal regional anesthesia performed with hyperbaric bupivacaine for the appendectomy surgery were observed to be sufficient and the rate of side effects was low. It was concluded that spinal anesthesia performed in the appendicitis surgeries provided an effective, safe, and comfortable anesthesia.

KEYWORDS: spinal anesthesia, analgesia.

1. INTRODUCTION

The practice of the anesthesia is always planned according to the age, gender, general condition of the patients and the arranged intervention. Regional anesthesia is applied with a local anesthetic agent around the nerve or nerves innervating a certain body area. If we classify the nerve blocks in two groups as peripheral and central blocks; blocks of peripheral nerves, ganglions and plexus are considered as peripheral nerve blocks and spinal and epidural blocks as central nerve blocks. For both, a detailed knowledge of anatomy and physiology and a well-trained physician are essential.[1,2] The spinal anesthesia is achieved with the injection of a local anesthetic agent into the subarachnoid space. A small volume of the local anesthetic enables the blockage of all senses in the lower part of the body. It is usually applied below the termination point level of the spinal cord.[1,2,3,4]

Following the first introduction by Bier in 1898, the spinal anesthesia came increasingly to use.[1] However, its practice is relatively more difficult compared to the general anesthesia and unsatisfactory outcomes are not uncommon even in experienced hands and its implementation may last relatively long.[2,3] The regional anesthesia came also increasingly to use due to the following advantages: The patient is conscious during the intervention, spontaneous respiration is preserved, the airways reflexes are not suppressed, and a longer anesthesia is possible during the postoperative period.[1,2] As the usual duration of the appendectomy in children is approx. 45-60 minutes, spinal anesthesia may provide a sufficient anesthesia and surgical analgesia. In this study, our objective was to evaluate the efficacy and the outcome of the spinal anesthesia in children, who underwent an appendectomy.

2. METHODS

In this study, we screened data in the files of the patients, who underwent an appendectomy due to uncomplicated appendicitis with the spinal regional block anesthesia in the Pediatric Surgery Department of Services Hospital between February 2017 and September 2017. The study protocol was approved by the Training Planning Committee. The patient files were investigated for the examination results before the anesthesia, data related to the site of the spinal anesthesia, duration of the block, requirement for a concomitant general anesthesia, duration of the operation, requirement for additional medication, perioperative and postoperative complications. Children, who were between the ages of 8-18 years, diagnosed with appendectomy with the help of clinical, laboratory and imaging methods in the Pediatric Surgery Department and scheduled for an appendectomy, were in the ASA Group I-II, had no contraindication for the spinal anesthesia, were included in the study. Patients, who refused spinal anesthesia, had been diagnosed with cardiovascular and pulmonary disorders, had contraindications for the spinal anesthesia, known hypersensitivity to the agents to be used during the intervention and complicated appendicitis, were excluded from the study. Following the routine anesthesia monitorization (heart rate, peripheral oxygen saturation, non-invasive blood pressure), all patients received IV midazolam. Before the spinal anesthesia, all patients were sufficiently hydrated. After the monitorization and regular operation site cleaning, the patients were prepared for the intrathecal spinal anesthesia in the sitting position. Hyperbaric bupivacaine was used for the spinal anesthesia (0.3 mg/kg). The spinal anesthesia was administered intrathecally with a suitable needle at the level of the L3-L4 lumbar space, while the patient was in the sitting position.

3. RESULTS

Total 50 patients, who underwent appendectomy with a spinal regional block within an 8-month period, were included in the study. The median age of the patients was 12 years. 29 of the patients were males and 21 were females. During the preoperative anesthesia examination, 44 of them (88 %) were evaluated as ASA 1, and 6 (12 %) as ASA 2 according to the anesthesia risk classification. None of the patients had previously spinal anesthesia according to their medical history. The hemodynamic parameters of the patients were within the normal limits. The spinal anesthesia was successfully implemented in 47 patients (94 %) in one attempt and in 3 patients (6 %) in two attempts. Following the injection of the intrathecal anesthetic agent, we waited approx. 10 minutes for the establishment of the full spinal anesthesia. A full spinal block was achieved in all patients. Thus, none of the patients needed general anesthesia due to the lack of a full block. The mean time to an adequate spinal block and to the development of a full block was 8.3±1.2 minutes. The average duration of operations was 43.6±4.8 minutes. No problem was encountered during the surgical intervention. In 11 patients, intermittent propofol was administered via the intravenous route in addition to the spinal anesthesia. None of the patients experienced any complication during the spinal anesthesia. After the completion of the surgical intervention, patients were referred to the clinic without a need of an awakening process. In the first 24 hours of the postoperative period, only 2 patients (4 %) developed dizziness, hypotension and vomiting. The blood count and biochemical analysis were normal in these patients. No pathological findings were observed in the direct x-ray and abdominal ultrasonographic examination. After the overall examination of these patients, we concluded that these findings were not early-stage surgical complications and were complications, which might emerge after the spinal anesthesia. We initiated fluid supplementation and ondansetron treatment due to the headache, vomiting and hypotension, which were considered to be related to the spinal anesthesia. These complaints regressed after the restriction of the mobility and the administration of the medical treatment. Both patients were cured and discharged after 72 hours. The mean time to discharge after the operation was 2.4 days.

4. DISCUSSION

There are several reasons for the current preference for regional and spinal anesthesia by patients, surgeons and anesthetists. Most of the patients are afraid of not awakening after the general anesthesia and of the complaints like vomiting, sore throat, dysphagia, cough and severe pain. Therefore, they may prefer the methods, which enable them to stay conscious during the intervention.[1]

Regarding the literature, spinal block became an increasing practice in neonates and infants with high risk. However, there are not sufficient study focused on the use of this method in children older than 1 year. Studies conducted by Korki et al. in 90's and by BangVojdanovski et al. emphasized that spinal block had certain advantages in older children such as the preservation of the hemodynamics, decrease of the surgical stress and a more comfortable postoperative period.[15]

The doses recommended for the spinal anesthesia in childhood may change from study to study in the literature. Kokki et al. reported that hyperbaric bupivacaine with a dose of 0.4 mg/kg enabled a block over T4 and Tobias et al. published the bupivacaine dose for the children older than 6 months as 0.2-0.6 mg/kg.[15,25] In our study, hyperbaric bupivacaine (0.3 mg/kg) enabled a sufficient sensorial block and the incision could be started at 8.3±1.2 minutes. The same time was 7.0±1.1 minutes in the study of Çalışkan et al, who evaluated the anesthesia at the 5th minute after the spinal block.[17] These results are consistent with our study.

One of the important difficulties related to the spinal anesthesia in childhood is that the children refuse the implementation while they are conscious. There are reports in the literature stating that deep sedation is necessary for children younger than 7 years.[18] Therefore, we administrated midazolam before the anesthesia to our patients and we did not encounter any problem.

There are also publications in the literature, which demonstrated that the complications related to the spinal anesthesia are rather rare in children.[19,20]

Although headache is one of the important complications following the spinal anesthesia, it is rather uncommon in children below 10 years of age.[19] It was reported that this complication depended on the low CSF pressure in children. Regarding the literature, the incidence of headache was 4-5 % in children between the ages of 2-15 years.[21,22] In our study, none of the patients complained of headache.

It is known that hypotension emerges due to the sympathetic blockage, which develops after the implementation of the spinal anesthesia and consequently decreases the venous return and vascular resistance. The incidence of hypotension after the spinal anesthesia was between 8.2 % and 57.9 % in the literature.[1,2,6,10,11,12,13] The incidence of cardiac arrest due to the hypotension and bradycardia was between 0.018 % and 0.029 %.[6,11] The fluid supplementation before the spinal anesthesia and vasopressor agents used prophylactically or after the onset of hypotension are effective on the prevention of hypotension after the spinal anesthesia.[7,10] In the literature, the rate of lumbar pain after the spinal anesthesia was 0.8 % during the follow-up examination in the 3rd month after the operation. Hypotension is rare and transient in older children.[15,16] However, hypotension and bradycardia may be encountered after the spinal anesthesia in children older than 5 years. In our study, the rate of the hypotension was rather low (4 %).

A poor asepsis before and during the implementation of the spinal anesthesia or the presence of bacteremia may lead to certain infectious complications. The most important complication is bacterial meningitis. The onset of meningitis may be between 48 hours and 30 days and it manifests itself with symptoms like severe headache, fever and convulsion. Except these, certain complications such as neurological conditions, urinary retention, hearing loss and hypothermia were reported after the spinal anesthesia according to the literature.[1,3,8,9,14] In our study, we did not observe any infectious complication related to the spinal anesthesia.

As the management of the possible complications of the spinal regional anesthesia in the children is rather difficult, it is rarely implemented in this age group. On the other hand, it is well known that if spinal anesthesia provides sufficient sensorial and motor block, it is a safe procedure in the uncomplicated appendectomy in children.[5]

5. CONCLUSION

In conclusion, we observed that the sensorial and motor block properties of the spinal regional anesthesia applied with the hyperbaric bupivacaine is a satisfying procedure in the appendectomy and has a low rate of side effects. We conclude that spinal anesthesia is an effective, safe and easy-to-implement method in the appendicitis surgery. Currently, spinal anesthesia is in use in children and further developments are on-going. Nevertheless, it should be kept in mind that the neurological complications may emerge even in experienced hands, although it was reported that the complication rate of the spinal regional anesthesia is very low in the pediatric age group. Before the implementation of any type of the regional anesthesia, a detailed physical examination, anamnesis and briefing to patients and relatives about the possible complication should be performed.[23,24] The retrospective design and the small subject size were the main limitations of our study. Further studies with larger samples sizes and a prospective design will be very useful for the evaluation of this group of patients.

REFERENCES

1. Auroy Y, Benhamou D, Bargues L, et al. Major Complications of Regional Anesthesia in France. Anaesthesiology, 2002; 97: 1274-80.
2. Nielsen KC, Steele SM. Outcome after regional anaesthesia in the ambulatory setting- is it really worth it? Best Pract Res Clin Anaesthesiol, 2001; 16: 145-57.
3. Mordecai MM, Brull SJ. Spinal anesthesia. Curr Opin Anaesthesiol, 2005; 18(5): 527-33.
4. Chin KJ, Perlas A, Chan V, et al. Ultrasound Imaging Facilities Spinal Anesthesia in Adults with Difficult Surface Anatomic Landmarks. Anaesthesiology, 2011; 115: 94-101.
5. Watson MJ, Evans S, Thorp JM. Colud ultrasonography be used by an anaesthetist to identify a specified lumbar interspace before spinal anaesthesia. Br J Anaesth, 2003; 90: 509 11.
6. Hartmann B,Junger A, Klasen J, et al. The Incidence and Risk Factors for Hypotension After Spinal Anaesthesia Induction: An Analysis with Automated Data Collection. Anesth Analg, 2002; 94: 1521-9.
7. Jackson R, Reid JA, Thorburn J. Volume preloading is not essential to prevent spinal-induced hypotension at Caesarean section. Br J Anaesth, 1995; 75: 262-5.
8. Erk G. Rejyonal Anestezi ve Nörolojik Komplikasyonlar. Turkiye Klinikleri J Anest Reanim, 2007; 5: 87-97. Derleme.
9. Baldini G, Bagry H, Aprikian A, et al. Postoperative Urinary Retention: anesthetic and perioperative considerations. Anaesthesiology, 2009; 110: 1139-57.

10. Lee A, Ngan Kee WD, Gin T. Prophylactic ephedrine prevents hypotension during spinal anesthesia for Caesarean delivery but does not improve neonatal outcome: a quantitative systemic review. Can J Anesth, 2002; 49: 588-99. Review.
11. Chinachoti T, Tritrakarn T. Prospective Study of Hypotension and Bradycardia during Spinal Anesthesia with Bupivacaine: Incıdence and Risk Factors. J Med Assoc Thai, 2007; 90: 492-501.
12. Visalyaputra S. Maternal mortality related to anesthesia: can it be prevented? Siriraj Hosp Gaz, 2002; 54: 533-9.
13. Max GF, Rabin JM. Anesthesia for cesarean section and neonatal welfare. In: Raynols F, editor. The effects on the baby of maternal analgesia and anesthesia. London: WB Saunders, 1993; 237-51.
14. Lamonerie L, Marret E, Deleuze A, et al. Prevalence of postoperative bladder distention and urinary retention detected by ultrasound measurement. Br J Anaesth, 2004; 92: 544-6.
15. Tobias JD. Spinal anaesthesia in infants and children. Paediatr Anaesth, 2000; 10: 5-16.
16. Kokki H, Hendolin H. Comparison of spinal anaesthesia with epidural anaesthesia in pae-diatric surgery. Acta Anaesthesiol Scand, 1995; 39: 896-900.
17. Calışkan E, Sener M, Koçum A, Bozdoğan N,Arıboğan A. [Our experiences with spinal anesthesia in pediatric patients]. Agri, 2011; 23: 100-6.
18. Apiliogulları S, Gök F, Duman A. [Spinal aanesthesia in children: a single-center experience of 371 cases.] Türk Anest Rean Der Dergisi, 2010; 38: 339-47.
19. Gupta A, Saha U. Spinal anesthesia in children: A rewiew. J Anaesthesiol Clin Pharmacol, 2017; 30: 10-8.
20. Ecoffey C, Lacroix F, Giaufré, Orliaguet G, Courrèges P; Association des Anesthésistes Réanimateurs Pédiatriques d'Expression Française (ADARPEF). Epidemilogy and morbidity of regional anesthesia in children: A follow-up one-year prospective survey of the French-Language Society of Pediatric Anesthesiologists (ADARPEF). Paediatr Anaesth, 2010; 20: 1061-9.
21. Kokki H. Spinal blocks. Paediatr Anaesth, 2012; 22: 56-64.
22. Kokki H, Hendolin H. Comparison of 25 G and 29 G Quincke spinal needles in pediatrics day case surgery. A prospective randomized study of puncture characteristics, success rate and postoperative complaints. Paediatr Anaesth, 1996; 6: 115-9.
23. Oberlander TF, Berde CB, Lam KH, Rappaport LA, Saul JP. Infants tolerate spinal anesthesia with minimal overall autonomic changes: analysis of heart rate variability in former premature infants undergoing hernia repair. Anesth Analg, 1995; 80: 20-7.
24. Imbelloni LE, Vieira EM, Sperni F, Guizellini RH, Tolentino AP. Spinal anesthesia in children with isobaric local anesthetics: Report on 307 patients under 13 years of age. Paediatr Anaesth, 2006; 16: 43-8.
25. Puncuh F, Lampugnani E, Kokki H. Use ospinal anaesthesia in paediatric patients: a single centre experience with 1132 cases Paediatric Anaesth, 2004; 14: 564-7.