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Spinal anaesthesia applications in pediatric sub-abdominal operations

Abstract

Introduction: Spinal anesthesia is increasing in pediatric patients; 14 children of various ages who were operated for lower abdominal diseases were treated retrospectively.

Cases: Intraoperative vital signs were stable. Hypotension and bradycardia were not observed generally; 0.5mg atropine was administered in only 1 patient. Heart rate and blood pressure were monitored from the monitor. The sensory dermatomal level was below thoracal 8. Postop pain, nausea, vomiting, itching, and tremor headache were not observed. Patient satisfaction and surgeon satisfaction were evaluated as very good. The patient had no tension or fear. The surgeon was not forced during the operation due to muscle spasm and the operation was successful. Intraoperative pulse, tension, mean arterial pressure, sp02 were noted; at least 73/min, 100/50.75mmhg, 97 respectively. All of the patients were discharged without complications. No serious side effects such as cardiovascular collapse, total spinal block, neurological damage, intravascular injection associated with spinal anesthesia were encountered. It is very important to use a safe, rapid-onset and effective anesthesia method in pediatric surgical procedures, where intraoperative pulmonary and cardiovascular stability is preserved and stress response is suppressed and effective postoperative analgesia is provided.

Keywords: spinal anesthesia, pediatric patients, sub-abdominal operations, bradycardia, hypotension

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Introduction

Spinal anesthesia is increasing in pediatric patients. While it was first selected in premature babies in which general anesthesia was considered contraindicated or risky, it was started to be used according to the choice of anesthesiologist in suitable patients in every age group. Despite the advantages of spinal anesthesia in the pediatric age group such as hemodynamic disturbance and short duration of action, it has not been an anesthesia method that can be used as often as in adult patients.[1,2]

Material-method

In our pediatric surgery clinic, 14 children of various ages who were operated for lower abdominal diseases were treated retrospectively. The individual characteristics of the patients (age, gender, body weight, height), ASA (American Society of Anesthesiology) scores, the features related to the operation (type of operation, duration), the need for intraoperative sedation, features related to the spinal block (the position in which it was performed, the type of needle used, in the trial , number of failed spinal anesthesia, medications used, complete recovery times from motor block (hip flexion), intraoperative and early postoperative complications (hypotension, bradycardia, desaturation: SpO2 <95%) and time to get out of the waking room, patient Follow-up records were examined and recorded. Patients with coagulation problems and using anticoagulants were not included. In our clinic, Spinal block is applied as follows; before the operation, all patient relatives are informed about spinal anesthesia, its advantages and complications, and other anesthesia methods and informed written consents are obtained. Children of 10 kg and above are about 30 minutes from the operation before from 0.25 to 0.5 mg/kg-1 midazolam (maximum 10 mg) applying the premedicated . Spinal block planned area prilocaine-lidocaine cream (Crem® EMLA 5%, Astra Zeneca, Istanbul, Turkey) approximately 1 hour before[3] Children over the age of six are told how to perform spinal anesthesia by reviving the morning of the operation. Children coming to the operating room are carefully monitored by non-invasive methods (pulse oximetry, electrocardiogram, and non-invasive blood pressure). After the intravenous vascular access is opened to patients older than 6 years, which can be convinced when it comes to the operating room, spinal block is applied with a 27G needle from the midline in a sitting position. Spontaneous breathing is monitored by providing additional oxygen with a simple face mask when deemed necessary during the operation. Patients are not allowed to be placed in trendelenburg position, even temporarily (cautery placement etc.).

In children placed in the supine position, immobility of the feet and the absence of a painful stimulus applied by the surgeon over the surgical area with a toothless clamp are recorded as successful spinal anesthesia (after about 2-10 minutes). General anesthesia is started in patients who are considered to have no spinal anesthesia after ten minutes. In patients who need sedation during the operation, firstly, toys suitable for age and gender are given. Patients whose restlessness and/or surgeon are disturbed are sedated with intravenous propofol or midazolam. Patients who are hemodynamically stable, awake and found to have motor block removed in the recovery room are considered ready to exit the recovery room and this period is recorded. All patients are monitored in the anesthesia recovery room for at least 1 hour, and those ready for exit are sent to their services. Mothers of patients waking up during this period are allowed to be taken to the recovery room.[4–10]

Result

The average age of the patients was 6 years. 7 of them were male and 7 were female. Average body weight was 10kg and average height was 100cm. All patients had ASA 1 risk. The average operative time was 40 minutes. The distribution of the patients' cases was inguinal hernia, appendicitis, circumcision, and undescended testicular

operations. Neither failed spinal anesthesia cases nor intraoperative anesthesia was required. Additional analgesic requirement was postop metamizole (dipyrone) in only 2 patients; but vas in the post-awakening room vas 0. Primperan (metoclopramide hydrochloride) was applied in only 1 patient because of emesis. Intraoperative vital signs were stable. Hypotension and bradycardia were not observed; 0.5mg atropine was administered in only 1 patient. The sensory dermatomal level was below Thoracal 8. Postop pain, nausea, vomiting, itching, and tremor headache were not observed. Patient satisfaction and surgeon satisfaction were evaluated as very good. Intraoperative pulse, tension, mean arterial pressure, sp02 were noted; at least 73/min, 100/50.75mmHg, 97 respectively. All of the patients were discharged without complications. No serious side effects such as cardiovascular collapse, total spinal block, neurological damage, intravascular injection associated with spinal anesthesia were encountered.

Discussion

It is very important to use a safe, rapid-onset and effective anesthesia method in pediatric surgical procedures, where intraoperative pulmonary and cardiovascular stability is preserved and stress response is suppressed and effective postoperative analgesia is provided. Spinal anesthesia in newborns and infants has been reported as the gold standard due to the preservation of hemodynamics, and reduced risk of postoperative apnea. The method of spinal intervention in children has some differences, especially due to the anatomical changes of the newborn. However, these differences change at the end of 1 year and the anatomy becomes similar to that in adults. For this reason, in children over 1 year old, a spinal block can be applied from the best palpable range between the S1-L3 vertebrae. Some advantages of spinal anesthesia over general anesthesia and epidural anesthesia have been shown before.[11,12] The reasons for this selection are the easy-to-apply and rapid onset of spinal anesthesia that has been reported previously, the absence of severe hypotension, bradycardia and pulmonary complications even in patients with sensory block levels above T4, and the comfort of the patient who is fully awake in the early postoperative period is much better.[13,14] It has been reported that the frequency of headache is low with 26 G sharp tip and 27 G pen tip needles after spinal block application.[15–17] Apiliogullari et al.,[16] the rate of headache after spinal anesthesia in sharp, reported it was 4.5% with tipped needles and 0.4% with pen tipped needles (p=0.00). In terms of low back pain, there was no significant difference between the needles used. While spinal block can be applied with sharp-tip needles without using an intraduser, mostly spinal click cannot be felt.[15]

While a spinal click can be felt with pencil-type needles, intradusers must be used to pass through the skin as the tips are not sharp.[15–17] During application, the skin and subcutaneous tissue are passed by using intrtaduser, and then the spinal needle is tried to be reached by passing a pencil-typed spinal needle through the intraduser. However, as intradusers do not contain styli, just as with styli-free needles, a complication of dura perforation may occur during their use, which can lead to serious conditions and cause dermal cell transport.[18] For this reason, the practitioner should be very careful and sensitive and the family should be informed forward in such a situation. As a result of our experience, the use of pen-tip needles with a lower incidence of headache is chosen primarily for spinal anesthesia applications in our clinic. One of the agents frequently used for spinal anesthesia in children is hyperbaric bupivacaine.[19] In a study comparing hyperbaric bupivacaine with isobaric bupivacaine in pediatric spinal anesthesia, the success rate was reported to increase significantly with hyperbaric bupivacaine.[20,21] Although the lowest dose of bupivacaine used for the adolescent age group was 0.2-1 mg/ kg.[2] It has been reported that doses as high as 0.5-1 mg/ kg can be used safely without serious side effects.[13,14]

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Conflicts of interest

The author declares that is no conflicts of interest.

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