

Spinal Anesthesia for a Premature Infant Weighing 800 gm

Sir,

Pediatric regional anesthesia is becoming very popular in recent days with minimum levels of morbidity (ideally to zero) with reduced incidence of apnea.^[1,2] The popularity can be attributed to the following reasons: 1. availability of less traumatic devices. 2. Availability of less toxic local anesthetic (LA) drugs, and 3. scientific advances about the knowledge of pediatric anatomy, physiology, and pharmacology.

The doses of LA drugs used in neonates and infants may appear to be higher^[1,3] than those used in adult patients. That is, in practice, only one-third of the children's dose is used in adults to obtain the same concentration of LA in the cerebrospinal fluid (CSF). The reasons are as follows: 1. The volume of CSF in children relative to body weight is twice that that in adults, and 2. half of the total volume of CSF in children is in the spinal sub arachnoid (SA) space. (adult—only ¼th of the total volume CSF is in the spinal SA space) and so after LA drug is injected it becomes more diluted with this increase in CSF volume.

The shorter duration of action^[1-4] of LA in children is due to the increased dilution of LA in the increased volume of CSF and greater blood supply.

Here, we would like to share our experience of spinal anesthesia for the release of amniotic band in a premature baby weighing 800 gm.

A 2-day-old female infant diagnosed with amniotic band syndrome (left leg) or (amniotic band constriction) was posted for the amniotic band release under RA on 20 October of 2010. Her gestational age at birth was 32 weeks and birth weight 800 gm. During the preanesthetic evaluation on the day of delivery was unremarkable except low body weight of 800 gram (normal weight of infant at this age is 2–2.5 kg). Her hemoglobin level was 9 gm%. The baby was accepted for surgery under spinal anesthesia as a high-risk case because of the prematurity and low body weight.

On the operation table, she was premedicated with glycopyrrolate (5 µg) intravenously (IV) since IV line was secured already on the dorsum of the left hand. The baby was connected to electrocardiography monitor, pulse oximeter, and temperature monitor. She was given oxygen through Ventimask. The child was placed left lateral with continued ventimask oxygenation. After adequate aseptic precaution and local infiltration (to avoid failure of block due to unnecessary back movement) by lignocaine, spinal anesthesia was performed at L₃L₄ space using 24G needle.^[4] After getting clear CSF 0.5% heavy bupivacaine (0.2 mL) was injected

over 20 s,^[1] and the baby was positioned supine. The onset of analgesia occurs within 2–4 min. The child was very stable hemodynamically^[1,2,5] with heart rate 148–156 beats/min^[1] and SpO₂ 98–99% and body temperature of 34–35°C throughout the surgical procedure that lasted for 50 min. A total volume of 25 mL of pediatric electrolyte solution was infused IV. The immediate postoperative period was uneventful. Postoperatively, the baby was observed for 24 h and vital parameters monitored closely, especially respiratory rate for any apneic spells that was also uneventful.

In our institute, all types of regional anesthesia are used routinely for all patients particularly pediatric patients. However, this was the first time we performed spinal anesthesia for a premature baby weighing 800 gm. Further, this may be the first record of performing SA for a baby weighing 800 gm [Figure 1].

As the baby was prematurely born with low body weight at the time of surgery, we considered it as a premature baby and planned our anesthesia keeping in mind the prematurity of all body systems and altered pharmacokinetics of drugs used in anesthesia. We took all precautions to prevent hypothermia perioperatively.

Hypotension and bradycardia are usually not seen^[1,2,5] before 8 years of age and it is of minor degree even if it occurs in adolescence. The reasons are as follows: 1. it was thought to be due to the immaturity of the autonomic nervous system (ANS). 2. it is due to the sequestration of very less fraction of blood in the lower limb when comparing to their total blood volume, and 3. the threshold of peripheral vascular resistance seems to be lower. This hypotension usually does not require any treatment.

Respiratory paralysis rarely occurs but not is eliminated completely^[1] in a normal child without any degree of respiratory distress, unless the block extends up to the cervical dermatomes and paralyzes the diaphragm. Even if it occurs, it may be due to the excessive dosage and can be treated without

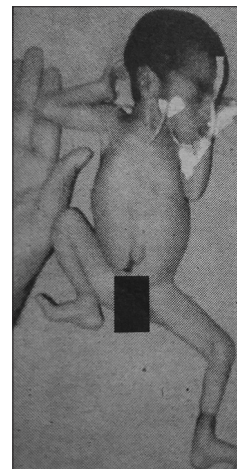


Figure 1: Amniotic band syndrome—infant weighing 800 gm

any sequelae by a. attending before the patient develops an asymmetrical and irregular dilatation of pupils. b. ventilatory support, volume expansion, and if needed, with vasopressors and it may take 60–90 min for a full recovery.

To conclude, the use of spinal anesthesia was safe in case of premature infant for any infraumbilical surgeries particularly which last for not more than 45 min.^[1-3] The spinal anesthesia offers the following advantages: a. absolute cardio vascular system (CVS) stability, b. good muscular relaxation, c. unaffected respiration, d. avoids all complications of general anesthesia (GA), e. respiratory system (RS) infection can be of no problem, f. early post operative (PO) feeding, g. faster and smoother recovery with early ambulation, and h. zero stress response.^[5]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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