Spinal Anaesthesia for Exploratory Laparotomy in a Six Day Old Neonate : A Case Report

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Introduction

Recent advances in perinatal care have improved the survival of sick neonates. These neonates may have congenital or acquired anomalies that require operative correction. Subarachnoid anaesthesia is becoming increasingly popular for surgery in neonates and infants. Its use is no longer restricted to minor operative procedures like repair of congenital inguinal hernia. These days spinal anaesthesia is employed in neonates for diverse surgical procedures e.g. major abdominal surgery [1], orthopaedic procedures on spine and lower limbs [2], repair of meningomyelocele [3] and even for ligation of patent ductus arteriosus [4].

Case Report

A female baby born to full term primigravida by an uneventful normal delivery (Apgar 7/10 & 10/10) was doing well till 40 hours after birth when she developed yellowish brown loose motions and vomited twice. Examination revealed a lethargic 2.9 kg female neonate having sluggish neonatal reflexes, a heart rate of 130/min and respiratory rate of 38/min. The assessed gestational age was term. The abdomen was distended with prominent superficial veins. Bowel sounds were sluggish. Rectal examination was normal. Examination of cardiovascular and respiratory system was unremarkable.

Plain X-ray abdomen showed distended bowel loops with multiple air fluid levels and gas in the wall of the left colon. Based on the clinical presentation, X-ray findings of intestinal obstruction with pneumatosis intestinalis, a diagnosis of necrotising enterocolitis was made. The child was initially managed conservatively with IV fluids, broad-spectrum antibiotics and nil orally. The child showed no improvement. Her general condition worsened, she developed tachycardia, tachypnoea and fever. Her lethargy and abdominal distension increased. Repeat X-ray abdomen showed gas under the diaphragm.

A diagnosis of perforation of hollow viscous with faecal peritonitis was made and the child was taken up for surgery. Preoperative examination revealed a toxic, 2.8 kg, six day

old female neonate having features of septicaemia. Heart rate - 160/min, respiratory rate-46/min and oxygen saturation 82% on room air. The child was taken up for laparotomy under spinal anaesthesia ASA grade IV E with high risk. Inj sensorcaine (0.5%) 0.3 ml was administered in the L4-L5 space using a 22G hypodermic needle and an insulin syringe. Heart rate, respiration, oxygen saturation and ECG were monitored. Oxygen was administered by a face-mask. Ringer lactate at the rate of 15 ml/kg/hour and whole blood 5ml/kg were administered.

Exploratory laparotomy revealed a large perforation at the splenic flexure along with necrotising gangrene of 12 cm of left transverse and descending colon. Resection of the gangrenous large gut with end transverse colostomy and Hartman's procedure was done. Duration of surgery was 75 min. Towards the end of surgery (60-65 min), the child appeared to be uncomfortable and started to flex the lower limbs. Closure was completed by injecting sesorcaine (4ml of 0.125%) at the wound edges.

The vital parameters of the patient were maintained at the preoperative level throughout the surgery. The oxygen saturation showed mild improvement due to oxygen supplementation. The lower limbs were flaccid and abdominal relaxation good. The child and the surgeon were comfortable throughout the surgery. Postoperatively the child's condition and vitals were very similar to the preoperative status. The child was shifted back to the premature baby unit. The child had a downhill postoperative course and died of septicaemia and multi system organ failure, 35 hours after the surgery.

Discussion

Neonatal surgery was always performed under general anaesthesia. However, spinal anaesthesia is a safe and effective alternative to general anaesthesia for major abdominal surgery in high risk neonates. A variety of extensive surgical procedures, including small bowel resection and genito-urinary procedures have been successfully performed under central neuraxis block [5]. In addition to reducing the incidence of postoperative apnoea, it has advantages of shorter operating time, avoidance of intubation and reduction in

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respiratory complication rate. It also reduces stress response to surgery and hospital stay.

Surgery generates a neuroendocrine stress response in neonates, infants and children resulting in undesirable alterations in the metabolic state and immune function. Epidural anaesthesia depresses or even suppresses this stress response and is well tolerated in children. Central blocks do not affect left ventricular function and are virtually free of measurable haemodynamic effects, at least upto the age of eight years. In older patients, a sympathetic block results in a slight but constant reduction in blood pressure, rarely exceeding 10-20% of their pre induction values. Preloading with saline is not recommended in children, even to treat haemodynamic effects of central blocks [6].

Spinal anaesthesia for laparotomy has one drawback - limited duration of action. In our case the neonate had started moving its lower limbs at the time of skin closure. Infiltrating the skin incision with inj sensorcaine circumvented this problem. It not only provided anaesthesia for completing the surgery but also provided postoperative pain relief. The drawback of limited duration of spinal anaesthesia can also be overcome by conducting the case under spinal plus epidural anaesthesia-epidural catheter is threaded up from the caudal space [5].

Spinal anaesthesia for the above mentioned case provided adequate analgesia and relaxation for laparotomy and gut resection. This was evident from the

fact that intraoperatively, both heart rate and saturation did not alter significantly from their preoperative levels. It is well known that spinal anaesthesia reduces postoperative oxygen desaturation and bradycardia in formerly premature infants and sick neonates [7]. This case demonstrates that spinal anaesthesia has similar benefits in the intraoperative period.

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