

# Spinal Anaesthesia or General Anaesthesia? Which is better in Premature Neonates: A Case Report

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## ABSTRACT

General anaesthesia in premature neonates is associated with various complications. Spinal anaesthesia can be better choice in premature babies in surgeries below umbilicus. Spinal anaesthesia provides all components of balance anaesthesia with minimum cardiorespiratory disturbance and post-operative nausea vomiting, early ambulation and rapid return of appetite. We report a case of one day old premature new-born who was given successful spinal anaesthesia and was operated with good outcome.

**Keywords:** Neonates, Premature neonates, Spinal anaesthesia

## INTRODUCTION

General anaesthesia (GA) in premature neonates is associated with various complications. The risk is increased if new-born is associated with multiple congenital anomalies. Spinal anaesthesia (SA) can be better choice in these premature babies in surgeries below umbilicus. Spinal anaesthesia provides all components of balance anaesthesia with minimum cardiorespiratory disturbance and post-operative nausea vomiting, early ambulation and rapid return of appetite. However it is difficult to administer spinal anaesthesia in premature new-borns of less than 1 week of age and also margin of error is very less.

## CASE REPORT

We report a case in which a one day old new born weighing 2.425 kg, presented with high anorectal malformation, left foot polydactyly with right eye corneal opacity. Patient underwent sigmoid colostomy under spinal anaesthesia on second day of life. New born was preterm normal vaginal delivery with no other congenital anomaly. In operation theatre, baby was lying comfortably in left lateral position, with back flexed and head extended to avoid airway compromise. Standard monitors were placed and intravenous access was established.

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Premedication done with Inj. Atropine 0.1 mg (IV) and Inj. Ketamine 5 mg (IV). A sterile preparation and drape was used. A small subcutaneous wheal of local anaesthetics was infiltrated. Then spinal needle of size 26 gauge was advanced in mid line at L4-L5 interspace. After feeling a pop the stylet was

removed to check for flow of CSF [Figure 1]. After confirming the free flow of Cerebro-spinal fluid Inj. Bupivacaine heavy 0.25ml (0.5%) was injected slowly in subarachnoid space. Then immediately new born was positioned supine. Intra-operatively, Inj. ketamine 5 mg (IV) was given for sedation. On Examination, vitals remained within normal limits intra-operatively. Surgery took an hour to complete and was uneventful.

## DISCUSSION

Paediatric regional anaesthesia continues to evolve. Regional anaesthesia has wide ranging benefits but requires technical expertise. Its use in neonates, infants and children continue to escalate, both as a sole anaesthetics or in combination with general anaesthesia to provide both intraoperative and initial postoperative analgesia.<sup>[1]</sup> Regional anaesthesia can decrease the detrimental hormonal stress response to pain which is 3 to 5 times greater in neonates when compare to adults.<sup>[2]</sup> In 1984, Chris Abajian used spinal anaesthesia as an alternative to general anaesthesia in the high risk preterm neonates, as a means of limiting the incidence of post-operative apnoea and bradycardia.<sup>[3]</sup> Since then, spinal anaesthesia has become a gold standard of care for moribund neonates. Its use in older children as an alternative to general anaesthesia has also been proved to be safe and associated with good analgesia with less morbidity.<sup>[4,5]</sup>

General anaesthesia in premature neonates is associated with various complications. The risk is increased if new-born is associated with multiple congenital anomalies. Spinal anaesthesia can be better choice in these premature babies in surgeries below umbilicus. However, it is difficult to administer spinal anaesthesia in premature new-borns of less than 1 week of age and it requires expertise. Spinal anaesthesia has been found to be associated with reduced incidence of apnoea, bradycardia, desaturation, and postoperative

ventilatory requirements in preterm infants with broncho-pulmonary dysplasia, intracranial haemorrhage and anaemia.<sup>[3,6]</sup> In children, incidence of complications is very less and infrequent.<sup>[6]</sup> Various advantages of Spinal Anaesthesia (SA) over General Anaesthesia (GA) are:

1. It is cheaper alternative due to rapid recovery and shortened hospital stay.
2. More effective than GA in blunting the neuroendocrine stress and adverse response to surgery with reduced plasma epinephrine, norepinephrine levels and improved outcome.<sup>[7]</sup>
3. Risks associated with tracheal intubation and effects of anaesthetic drugs can be avoided in high risk patients.
4. SA is safer in patients with medical and respiratory diseases who are otherwise at high risk under GA.<sup>[6,7]</sup>
5. Safety of GA drugs on rapidly growing brain cells, especially in neonates and infants have been questioned in many animal studies.<sup>[8]</sup>
6. Open tailed paediatric circuits are considered as one of the major contributors of environmental pollution depleting ozone layer which makes SA better than GA.

We have presented a case in which spinal anaesthesia was successfully used in a premature new-born with multiple congenital anomalies. This patient was at higher risk of complications due to general anaesthesia and by administering spinal anaesthesia risk was minimized. Also post-operative care is more vigilant in patients having general anaesthesia and they often need post op ventilation. Spinal anaesthesia is free of all these complications and it also provides better intraoperative and post-operative analgesia.

Spinal anaesthesia is safe, cost effective and feasible technique. It is quite safe in paediatric patients in the hands of an experienced anaesthetist provided proper patient preparation and adequate drug dosages have been used. So, spinal anaesthesia can be a preferred choice when used either alone or in combination with general anaesthesia in premature paediatric cases.

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**How to cite this article:** Ghani N, Varshney A, Hasan M, Jamil SN, Sinha A. Spinal Anaesthesia or General Anaesthesia? Which is better in Premature Neonates: A Case Report. *Ann. Int. Med. Den. Res.* 2015;1(3):334-35.

**Source of Support:** Nil, **Conflict of Interest:** None declared