ABSTRACT

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To assess and describe sonological anatomy relevant to caudal epidural block, its correlation with surface anatomy, and its use to diagnose occult spinal dysraphism in children under 2 years of age coming for urogenital or anorectal surgery.

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BACKGROUND
Surgeries involving the urogenital and anorectal system are one among the most commonly performed in the pediatric population. Anomalies of these systems are known to be associated with occult spinal dysraphism. The ideal anaesthetic care for these children undergoing surgery is combined general and regional anaesthesia. The presence of these spinal anomalies can remain unnoticed when neuraxial block is performed purely based on surface landmarks, thus increasing the risk of injuries to the spinal cord and meninges. Ultrasound imaging of the spinal structures before the ossification of the posterior arches has been found to be a sensitive technique in identifying neural and spinal malformations in children ages less than two years.
OBJECTIVES

Estimation of the prevalence of occult spinal dysraphism, to evaluate the variation in the location of the sacral hiatus and its relation to the posterior superior iliac spine as assessed by palpation and using ultrasound in children aged below 2 years requiring urogenital and anorectal surgeries using ultrasound.

METHODS

Type of study: Cross sectional study.

One hundred and sixty one patientsscheduled for urogenital or anorectal surgeries were assessed for eligibility. Two patients were excluded because the parents declined consent to participate. The remaining 159 wererecruited for the study after obtaining informed consent. Pre anaesthetic check-up, fasting guidelines, pre medication and conduct of anaesthesia was followed as per the departmental unit protocol. The patients were placed in the left lateral position after induction. The skin over the lower back was inspected for any cutaneous markers. The surface anatomy relationship between the posterior superior iliac spines and the sacral canal was studied using a skin marker and a ruler. Subsequently ultrasound scan was performed by anaesthesiologists and following parameters were assessed. The depth of the sacroccocygeal membrane from the skin, depth of sacroccocygeal membrane from the sacral hiatus, distance between the lower end of dura and the sacral hiatus, level of termination of the spinal cord and dura with respect to corresponding vertebrae, thickness of the filum terminale, presence of spinal cord pulsations were noted. The abnormal scans were counterchecked with radiologists. The presence of the spinal
anomaly was conveyed to parents and the need for follow up in neurosurgery OP was emphasized.

RESULTS

161 patients satisfying the inclusion criteria were recruited for the study. Parents of 2 patients refused to give consent for the study. Out of the 159 patients, only 5 patients had abnormal scan. The parents and the Pediatric surgeons were informed about the abnormal findings and were advised further imaging and follow up in neurosurgery department. The planned regional blocks were avoided and other peripheral nerve blocks were performed for analgesia.

CONCLUSION

The prevalence of occult spinal dyraphism in children with urogenital and anorectal anomalies was 3% which is higher than the general population. The location of sacral hiatus as determined by surface landmark technique correlates well with that assessed by ultrasound. The surface anatomy relation between the posterior superior iliac spines and sacral hiatus was found to be predominantly isosceles triangle. Perioperative ultrasound screening of the lower spinal anatomy by anaesthesiologists done prior to performing neuraxial block is worthwhile in ruling out occult spinal anomalies in children requiring urogenital or anorectal surgeries thereby avoiding injury to the spinal structures, thus enhancing safety in the practice of anaesthesiology.
**Key Words**

Occult spinal dyraphism, ultrasound, urogenital and anorectal malformations, sacral hiatus, posterior superior iliac spines, caudal epidural space, tethered cord, isosceles triangle.