Regional anaesthesia in children: pros and cons

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Regional Anaesthesia, as an adjunct to General anaesthesia (GA) for intraoperative and sometimes postoperative analgesia, is a common and accepted standard of care in paediatric and neonatal surgery.[1] Most frequently these include caudal, ilioinguinal/ iliohypogastric or spinal blocks for Genito-urinary, lower abdominal or lower limb surgery and penile blocks for hypospadius repair and circumcisions.[2] General anaesthesia can safely be offered to almost all infants and children, however narcotics for pain relief may produce significant respiratory depression. This can cause delays in discharge especially in Day care surgery.[3] Similarly, non steroidals may be contraindicated in the child due to atopy or reactive airway disease. These blocks are almost always placed after institution of GA as the child may not be able to tolerate lying still for the placement of the block. For the most part these blocks are safe if done by experienced hands in a monitored setting. Adverse events arise due to technical complications in placement of the block (such as small or poor anatomy), poor choice of patients and poor technical expertise as well as local anaesthetic toxicity.[4] Bupivacaine is the most commonly used drug. Toxicity includes neurologic and cardiogenic side effects.[5]

Recent review of literature shows a clear advantage of using these techniques when done correctly. Other than decreasing the pain it has also been shown to reduce blood loss intraoperatively, reduce the stress response of surgery and also a quicker return of gastric motility when compared to narcotics. However, in Pakistan where there is a dearth of centers of excellence for paediatric surgery and anaesthesia, one has to be very careful when such procedures are undertaken. Although the international rate of complications is low (7/ 10,000) there is no estimation of the frequency of adverse events in our country. Also invasive procedures such as neuraxial blocks require absolute sterility which may not be always ensured. Another consideration should be good nursing vigilance post operatively in the recovery room to make sure that these patients do not develop long term neurological deficits.

Ultrasound guided neuraxial and peripheral nerve block placement offers a promising new field which will increase the efficacy of the block and reduce chances of complications and failures.[6,7] Ultrasound guidance has demonstrated to improve block characteristics in children, including shorter block time, higher success rates, shorter onset time, less dosage of local anaesthetics used and greater visibility of structures. The learning curve is steep and expensive equipment may be required. Nerve stimulation is also being used for lower limb blocks. Ropivacaine has been used in other countries to improve the safety profile in children.[8] Since the length of the cord is small radio opaque dye confirmation of the catheter as well as fluoroscopic positioning has also been used. Important factors in choosing a particular technique include ease of administration, efficacy, cost, safety and patient and parent acceptance.[9] In all procedures proper monitoring and extreme vigilance is essential. Adverse drug events can often be fatal.

In conclusion the question arises, should one opt for co anaesthesia with regional techniques in children.[10] Literature points towards a positive response, however with great caution and only when the proper experience and monitoring is available.

References

1. Peutrell JM, Lonnqvist PA. Neuraxial blocks for anaesthesia and analgesia in children. Curr Opin Anaesthesiol 2003; 16: 461-70.
2. Reich A, Brinkmann OA. Regional anesthesia for urologic interventions in the pediatric age group. Aktuelle Urol 2004; 35: 418-25.
3. Rochette A, Daduve C, Raux O, Capdevila X. Changing trends in paediatric regional anaesthetic practice in recent years. Curr Opin Anaesthesiol 2009; 22: 374-7.
4. Abramov AD, Lekmanov AU, Popuv VV, Petrushina TA. Efficiency of pre-emptive analgesia using ketoprofen in a program of combined regional anesthesia in pediatric orthopedics. Anesteziol Reanimatol 2009; 26-8.
5. Johr M. Regional anesthesia in newborn infants, infants and children--what prerequisites must be met? Anaesthesiol Reanim 2003; 28: 69-73.
6. de Josemaria B, Galvez I, Reinoso-Barbero F. Ultrasound guidance in pediatric regional anesthesia. Rev Esp Anestesiol Reanim 2009; 56: 170-9.
7. Fredrickson MJ, Seal P. Ultrasound-guided transversus abdominis plane block for neonatal abdominal surgery. Anaesth Intensive Care 2009; 37: 469-72.
8. Fuzier R, et al. Adverse drug reactions to local anaesthetics: a review of the French pharmacovigilance database. Drug Saf 2009; 32: 345-56.
9. Giaufre E, Dalens B, Gombert A. Epidemiology and morbidity of regional anesthesia in children: a one-year prospective survey of the French-Language Society of Pediatric Anesthesiologists. Anesth Analg 1996; 83: 904-12.
10. Expert panel guidelines 2008. Postoperative pain management in adults and children. Ann Fr Anesth Reanim 2009; 28: 403-9.