Title : **CRITERIA FOR SAFE AMBULATION FOLLOWING CAUDAL BLOCK IN CHILDREN**

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INTRODUCTION: The use of caudal block to obtain postoperative pain relief in children is increasing (1). However there is uncertainty about when it is safe to permit ambulation of children who have had a caudal anesthetic as it said that motor block and sensory function return before sympathetic nervous system activity. Therefore, the aim of this study was to evaluate the return of motor, sensory and sympathetic nerve function following caudal block in children.

METHODS : After approval by the Human Research Committee and parental consent were obtained, we studied 10 children, ASA physical status I, aged 5±3 yr (mean ± SD; range 13 months - 10 yr), weighing 21 ± 10 kg (range 10-29 kg) scheduled for lower abdominal and urologic surgical procedures. All had fasted for 6 hours and were premedicated orally with diazepam (0.3 mg/kg). Anesthesia was induced with halothane, nitrous oxide and oxygen by mask and maintained with halothane (0.4 to 0.6 %) with 60 % nitrous oxide and oxygen. A cardiotachometer triggered by the ECG provided a continuous record of heart rate, and arterial blood pressure was measured by an automated blood pressure cuff. Once the children were anesthetized a single shot caudal was administered with either 0.25 % bupivacaine plus 1/200,000 epinephrine (n = 5) or a mixture of equal parts of 1 % lidocaine and 0.5 % bupivacaine with 1/200,000 epinephrine (n = 5), depending on the practice of the anesthesiologist. The volume used, 1 ml/kg was the same for all patients. At the end of surgery, inhalation anesthesia was discontinued and patients were taken to recovery room. During the postoperative period we assessed: 1) pain and/or discomfort using the scoring system proposed by Broadman et al (2) which takes into account arterial blood pressure, crying, movement, agitation and posture (maximum pain 10, minimum 0); 2) upper level of cutaneous analgesia by pinprick; 3) motor blockade of the lower limbs (no block, incomplete block, no movement); 4) sympathetic block by measurement of blood pressure and heart rate in the supine and upright positions. These measurements were recorded 2 hours and 4 hours after the caudal injection. All results are expressed as mean ± SD. Statistical analysis was performed using ANOVA and Kruskal-Wallis test as appropriate. $p < 0.05$ was considered significant.

RESULTS: No complications related to a block or adverse drug reactions were observed. The surgical analgesia was efficient in all children. The duration of surgery was 72 ± 23 min. The mean pain scores were 0.6 ± 0.5 and 1.6 ± 3.5, 2 and 4 hours, respectively after the caudal block. Before the end of the study, one child complained of pain and required supplementary analgesic medication. The upper level of cutaneous analgesia was T10 ± 2 (range T6 to T12) in 8 of 10 children, two hours after the caudal block. In two children the level of analgesia was not detectable. Four hours after the caudal block the level of analgesia was not detectable in 7 of 10 children. In the others, 2 had a level at T10 and one a level at L1. Two hours after the caudal block an incomplete motor blockade was found in 4 of 10 children (mean score 0.4) and at 4 hours no block was found in any child (mean score 0). None of the above differences in 2 and 4 hours scores were significant. Heart rate and arterial pressure in the supine and upright positions are summarized in the table. Although heart rate was significantly increased in the upright position, the changes were clinically insignificant (10 %). Arterial blood pressure was the same in both positions.

DISCUSSION : Our study confirms the efficiency of caudal block for lower abdominal and urologic surgery. In contrast to finding in adults (3) despite an upper level of cutaneous analgesia at T10, there was insignificant residual sympathetic blockade. A minor disadvantage of this technique is that motor blockade of the lower limbs still is present in 40 % of cases 2 hours after the caudal block, i.e., 30 min after the end of the surgery in this study. However, in all cases, the motor blockade has disappeared by 4 hours after the caudal injection. This was 2.5 hours after the end of the surgery, the usual discharge time of outpatients. In conclusion, an important advantage of caudal block in children is that the postoperative analgesia is prolonged without delay the discharge from the unit.

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TABLE. Systolic arterial pressure and heart rate. Mean values ± SD. * $p < 0.05$ statistical significance versus supine.

TIME	ARTERIAL PRESSURE (mmHg)	HEART RATE (bpm)
Supine	103 ± 12	119 ± 12
2 hours		
Upright	105 ± 16	128 ± 26*
Supine	105 ± 10	108 ± 21
4 hours		
Upright	100 ± 11	116 ± 28*