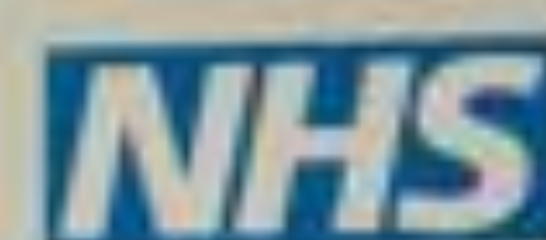


Effectiveness of Caudal Epidural Analgesia in Hypospadias Surgery

A Retrospective Case Review of 242 Paediatric Cases

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BACKGROUND

Hypospadias is one of the most common male congenital abnormalities occurring in approximately 1:250 to 1:300 live births⁽¹⁾. It presents with varying degrees of penile developmental defects including proximal urethral meatal opening and curvature of the penis.

Corrective surgery is a commonly performed procedure at our unit that requires effective peri-operative pain control to avoid discomfort, distress and also prevent any compromise of delicate surgical reconstructions. Caudal epidural represents our primary method of analgesia in the immediate peri-operative period.

Current recommendations include the use of either dorsal penile block or caudal epidural as part of multimodal analgesia⁽²⁾. Recent studies have suggested conflicting findings regarding the efficacy of caudal epidural^(3,4).

AIM AND OBJECTIVES

We evaluated the quality of analgesia and safety of caudal epidural in paediatric patients undergoing hypospadias corrective surgery.

METHODS

We performed a retrospective case review of all children receiving caudal epidural for hypospadias surgery (n=242) at our unit between January 2000 and March 2016. We examined patient demographics, caudal block technique, dose and type of local anaesthetic used, operative details, peri-operative analgesia, side effects and adverse events. Quality of analgesia was assessed using FLACC assessment tool. We assessed pain score at 30-minutes in recovery as well as the maximum score within the first 24-hours following the surgery.

The FLACC scale is based on 5 variables: Face, Leg, Activity, Cry and Consolability of the child. Each category is scored between 0-2, which results in a total score of 0-10, where 0 is considered relaxed and comfortable, 1-3 mild discomfort, 4-6 moderate pain and 7-10 severe pain.

MAIN RESULTS

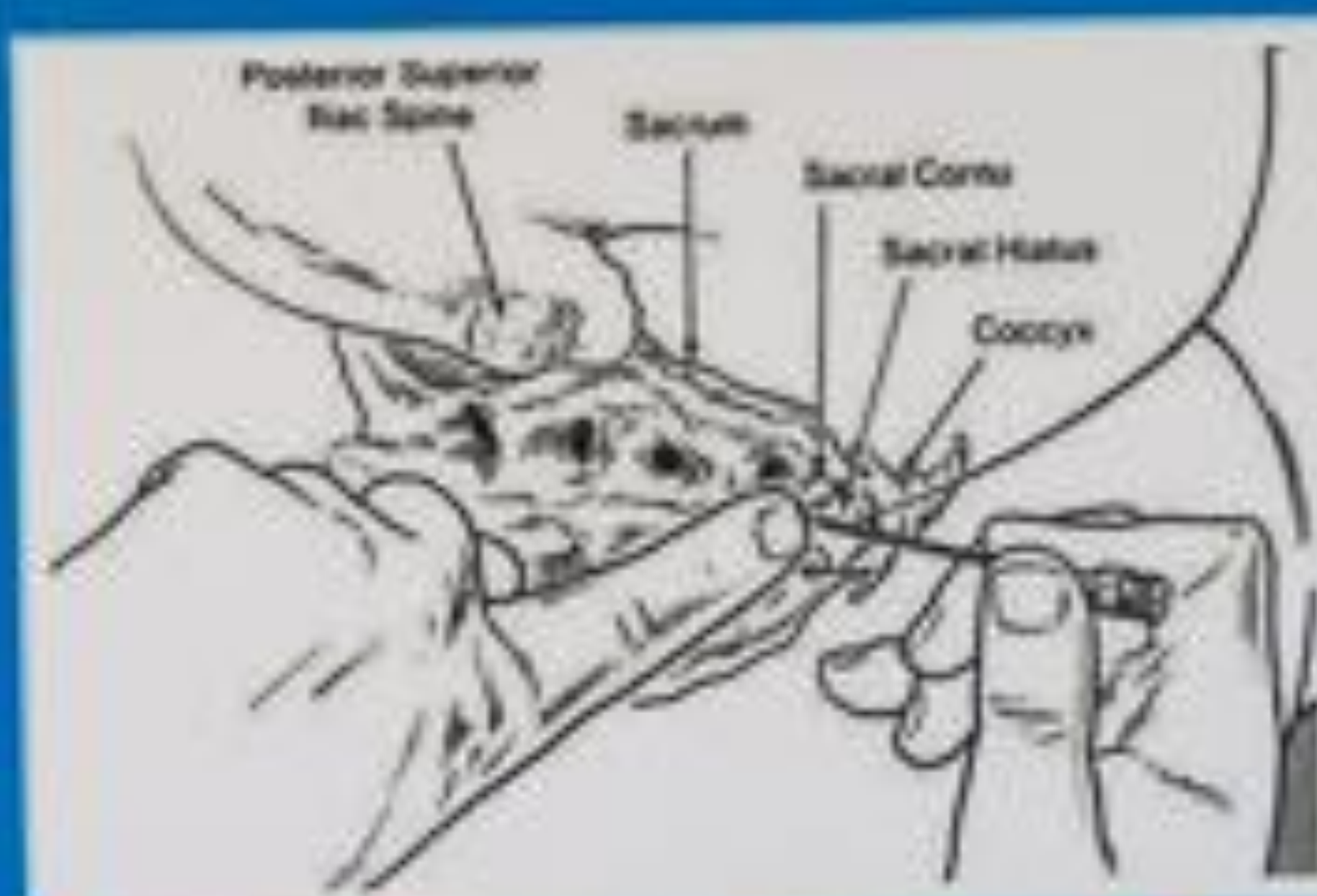
Mean age at operation was 4.1 years (range 1-15 years) with most patients aged 2-5 years at time of surgery. Premedication was administered in 65% of the cases. Single-stage and planned two-stage repairs represented 80% of cases, with salvage and re-operation representing the remainder. Post operative regular analgesia (paracetamol and ibuprofen) was prescribed and given in 97% of the cases.

No significant difference was found in pain severity for three different dose ranges of caudal epidural examined (<0.5, 0.5-0.7 and > 0.7 ml/kg, 0.25% levobupivacaine). Low pain scores (FLACC 0 to 3) over the first 24-hours were reported for 86% of patients, and moderate pain (FLACC 4-6) by 13.5%.

Fifty-percent of patients were drinking within 1-hour and 76% at 4-hours, while 56% were eating within 4-hours. Minor side effects including itch were reported in less than 1% of patients. No adverse events were documented over this time period.

FLACC Behavioural Pain Assessment Scale			
Categories	SCORING		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

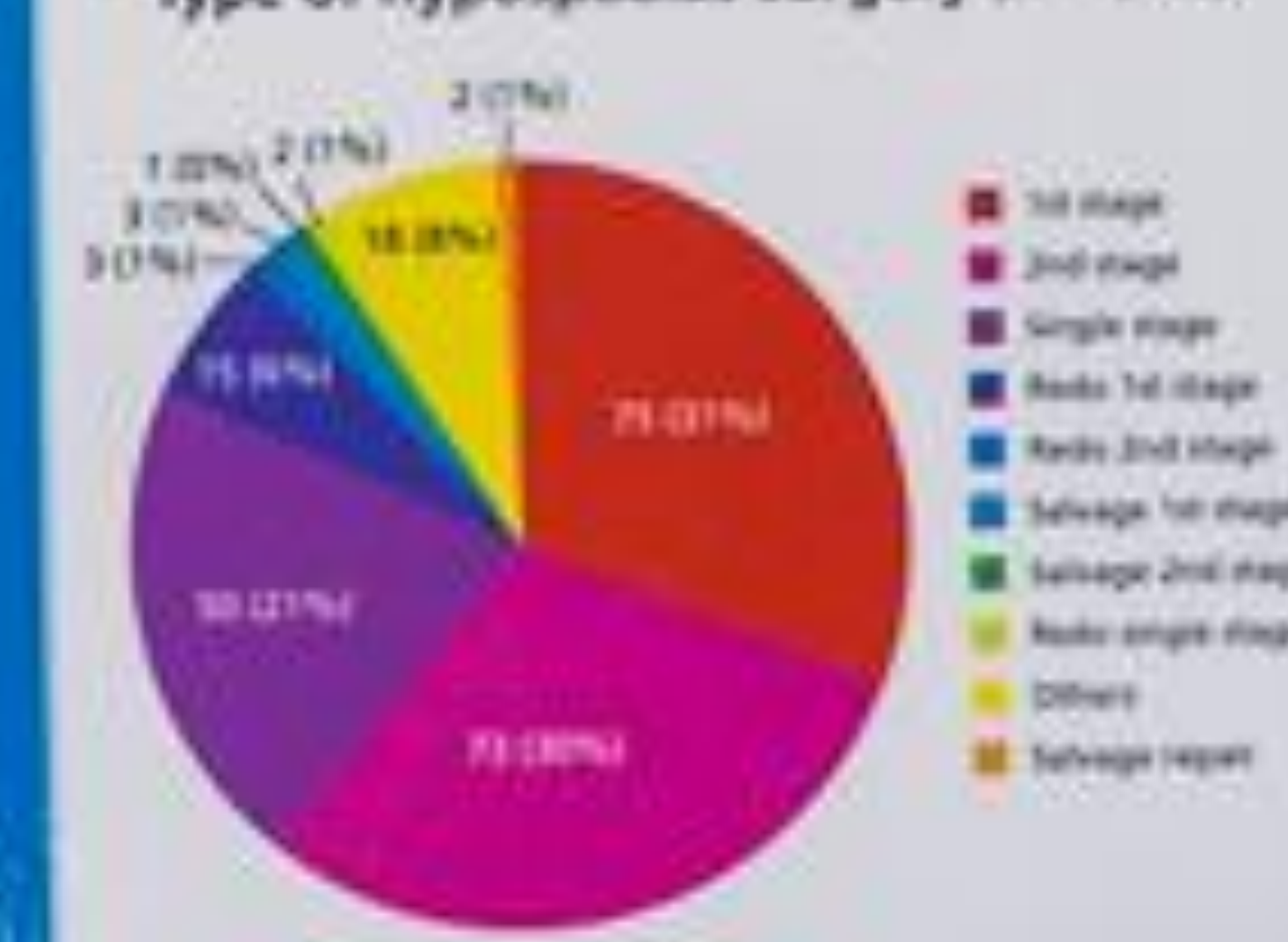
Table 1. From Merkel S. L., Hodgetts L., Shapiro J. R., & Malhotra S. (1991). The FLACC: A behavioural scale for scoring postoperative pain in young children. *Pediatric Nursing*, 23(3), 293-297. The FLACC scale was developed by Sandra Merkel, MS, RN, from Hodgetts-Lewis, MS, RN, and Shobha Malhotra, MD, at C. S. Mott Children's Hospital.



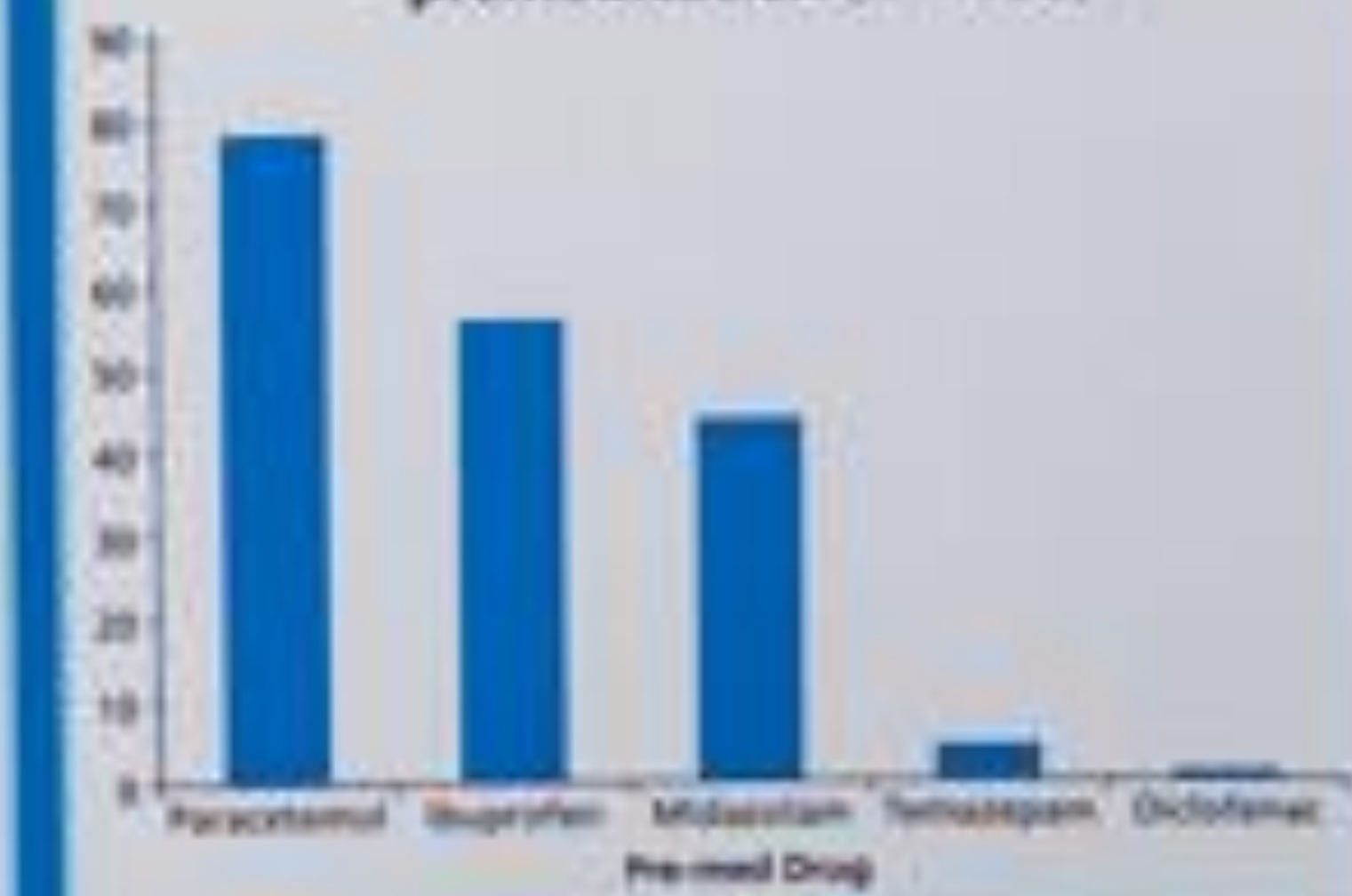
Demographics	
Age	
Mean Age (yrs)	4.1
Range (yrs)	1 - 15
Analysis (n=230)	n
Caudal Block only	230
Exclusions (n=12)	
Caudal + LA infiltration	9
Caudal + Dorsal Penile Block	3

Image ref: <http://www.sthospitals.nhs.uk/2016/02/22/caudal-epidural-block-review.html>

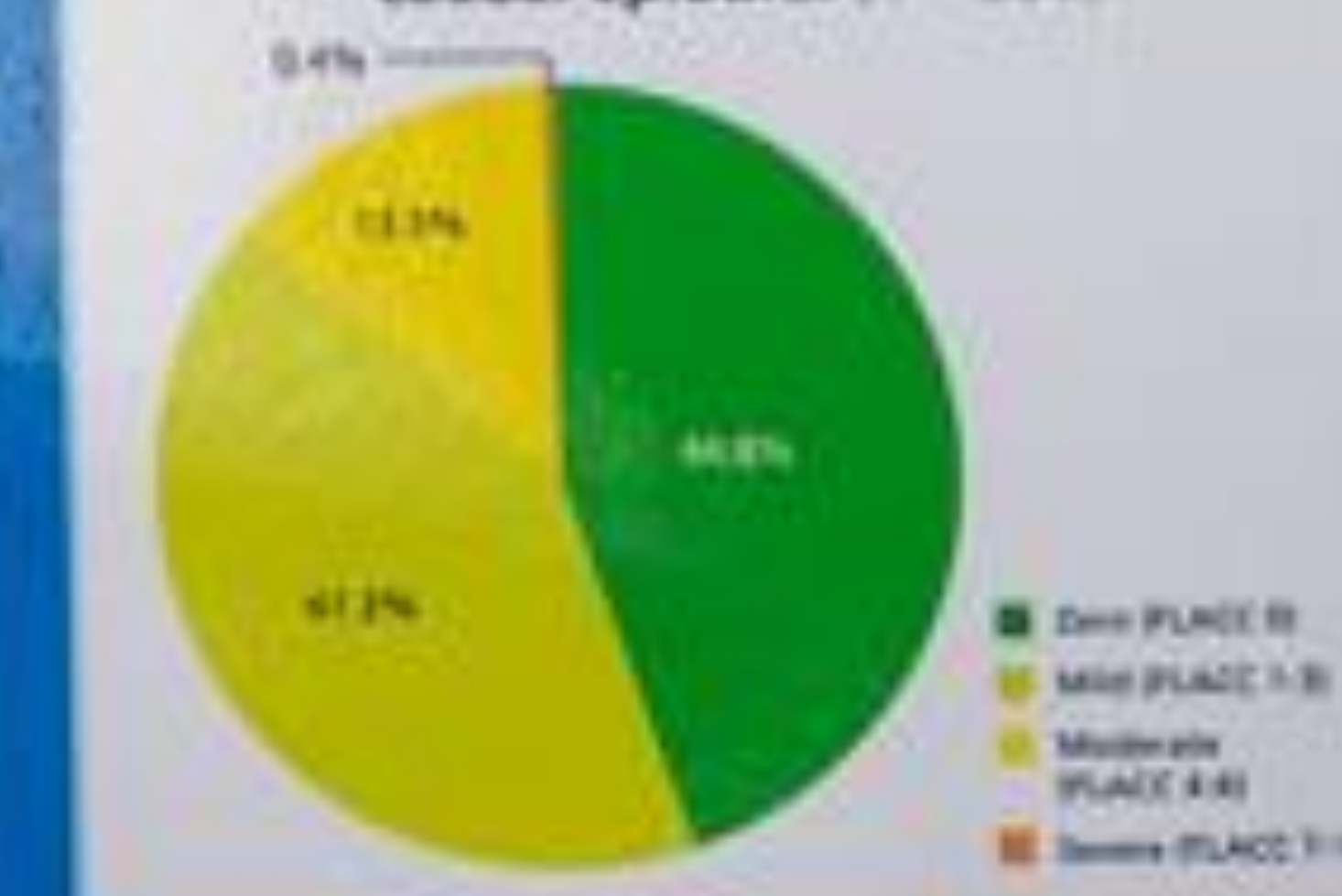
Type of hypospadias surgery (n = 242)



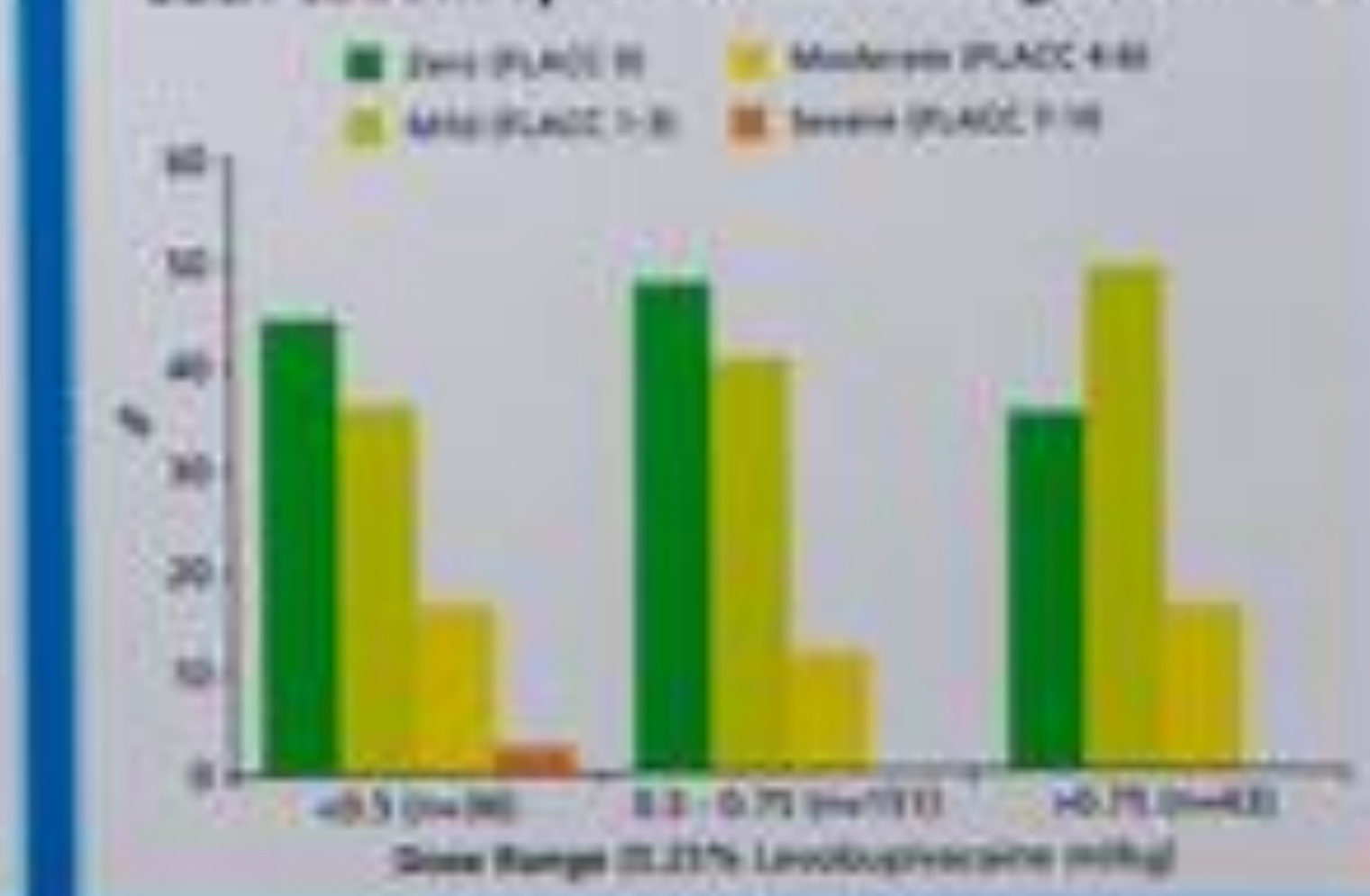
Drug administered to patients receiving premedication (n = 158)



Maximum pain score in first 24 hours with caudal epidural (n = 230)



Maximum pain score in first 24 hours with each caudal epidural dose range (n = 230)



CONCLUSIONS

We feel that caudal epidural provides an effective form of peri-operative analgesia for children undergoing hypospadias repair and has a good recovery profile with no complications. This study provides further evidence to support the safe use of caudal epidural. Additional investigation into the optimal paediatric dose and comparison to dorsal penile block would also be beneficial.

References
1 - Bastin G. S., & Ebers M. E. (2000). Hypospadias: Anatomy, etiology, and technique. *Journal of Urology*, 163(4), 1462-1472.
2 - Gonyea, J. (2011). *Textbook of paediatric anaesthesia and intensive care management*, 2nd edition (2011). London: Elsevier, 22-25.

3 - Aaga, Z. M. (2013). The effectiveness of Pudendal nerve block versus Caudal block Anaesthesia for Hypospadias in children. *Anesthesia & Analgesia*, 117(5), 1401-1407.
4 - Sriniva, S. (2011). Surgical outcome in children undergoing hypospadias repair under caudal epidural vs penile block. *Indian Journal of Anaesthesia*, 22(7), 707-712.