



## ORIGINAL RESEARCH ARTICLE

# PENILE NERVE BLOCK AT THE BASE OF PENIS IN COMBINATION WITH INTRAVENOUS KETAMIN PLUS MIDAZOLAM VERSUS GENERAL ANAESTHESIA(GA) IN CHILDREN UNDERGOING CIRCUMCISION FOR POST OPERATIVE PAIN MANAGEMENT IN EASTERN NEPAL

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### ABSTRACT

Adequate post operative analgesia in children provides satisfactory psychological objective of this study was to compare the post operative analgesia requirement and child satisfaction between two groups, general anaesthesia(GA) alone and GA in combination with penile nerve block. This prospective randomized study was conducted in 50 children aged 6 to 14 years, who underwent circumcision. The boys were randomly allocated into two groups. Group A (n = 25) received GA with Single shot ketamin 2mg/kg IV plus midazolam 0.1 mg/kg and dorsal penile nerve block at the base of penis prior to circumcision with and Group B (n = 25) received GA with ketamine 2mg/kg IV plus midazolam 0.1 mg/kg plus halothane by laryngeal mask. Severity of pain was assessed quantitatively by children's hospital eastern Ontario pain scale (CHEOPS). The pain intensity was assessed at one hour A1 in group A and B1 for group B and at two hour A2 for group A and B2 for group B during postoperatively period for two hours. Statistical analysis was done by SPSS method. The post operative analgesia was satisfactory with CHEOPS score 6 or <6 in group A 1. In group A 2 twenty two out of twenty five cases had CHEOPS score <6. Where as in group B1 and B2 it was > 6. Which was statistically 100% significant. In conclusion, combined penile nerve block in combination with intravenous ketamine plus midazolam is the satisfactory method of Post operative pain management in children undergoing circumcision.

**Key Words:** Analgesia, Circumcision, Penile nerve bloc.

### INTRODUCTION

Penile nerve block is a useful procedure for post operative analgesia in circumcision.<sup>1</sup> Circumcision performed under general anaesthesia (GA) with penile nerve block as an analgesic technique for postoperative pain reported to have good post operative analgesia as well as good patient's satisfaction than GA alone. It is simple to perform, safe, and effective for postoperative analgesia.<sup>2</sup>

### MATERIALS AND METHODS

This prospective study was conducted over four years (066-5-9 to 070-5-28) among 50 children aged 6 to 14 year in department of anesthesiology at Lumbini medical college Palpa, who underwent circumcision. Informed consent was obtained from parents or guardians, in accordance with the ethical requirements. No child received premedication. The boys were randomly allocated into two groups. Group A (n = 25) received GA with Single shot ketamine 2mg/kg IV plus midazolam 0.1 mg/kg and penile nerve block prior to circumcision with 1.5 mg/kg lidocaine 2% mixed with 0.5 mg/kg bupivacaine 0.5% without epinephrine, to a maximum dose of 7 ml using a 26 gauge needle and Group B (n = 25) received GA with ketamine 2mg/kg IV plus midazolam 0.1 mg/kg plus halothane by laryngeal mask. For Penile nerve block in group 'A' the needle

was inserted in the midline at the base of the penis up to the symphysis pubis. One paramedian injection of local anaesthetic was performed in order to block the dorsal nerves on both sides at "10.30-13.30" approach. Additional analgesia was administered on the raphe line at the border between the scrotum and penis to alleviate pain from the perineal nerves. Analgesia was checked at approximately five minutes after injection by gentle pinching the skin of the penis with mosquito forceps in group A. If child complain of pain, agitation and movement GA was continued with halothane by face mask. Inclusion criteria included of ASA grading 1 with no history of systemic illness. Exclusion criteria included of child with associated systemic diseases and common cold. Pulse oximeter, blood pressure and ECG was used as a routine monitors. The procedure involved transection of the foreskin, haemostasis by electrocautery and suture of the skin edges with 3-0 plain catgut. Statistical analysis was performed using spss method.

Severity of pain was assessed quantitatively by children's hospital eastern Ontario pain scale (CHEOPS). A score of six and less than six suggests lack of severe pain and was taken to be a satisfactory pain control. For similar reason a score of 7 and >7 was taken as severe pain. The pain intensity was assessed at

one hour A1 in group A and B1 for group B and at two hour A2 for group A and B2 for group B during postoperatively period for two hours using CHEOPS scale as follows:

**Table 1: Children's hospital eastern Ontario pain scale (CHEOPS)**

|              | <b>Behavioral</b> | <b>Definition</b>   | <b>Score</b> |
|--------------|-------------------|---|--------------|
| Cry          | No cry            | Child is not crying.  | 1            |
|              | Moaning           | Child is moaning or quietly vocalizing silent cry.  | 2            |
|              | Crying            | Child is crying, but the cry is gentle or whimpering.   | 2            |
|              | Scream            | Child is in a full-lunged cry; sobbing; may be scored with complaint or without complaint.        | 3            |
| Facial       | Composed          | Neutral facial expression.  | 1            |
|              | Grimace           | Score only if definite negative facial expression.  | 2            |
|              | Smiling           | Score only if definite positive facial expression.  | 0            |
| Child Verbal | None              | Child not talking.  | 1            |
|              | Other complaints  | Child complains, but not about pain, e.g., "I want to see mommy" or "I am thirsty".               | 1            |
|              | Pain complaints   | Child complains about pain.   | 2            |
|              | Both complaints   | Child complains about pain and about other things, e.g., "It hurts; I want my mommy".             | 2            |
|              | Positive          | Child makes any positive statement or talks about others things without complaint.                | 0            |
| Torso        | Neutral           | Body (not limbs) is at rest; torso is inactive.   | 1            |
|              | Shifting          | Body is in motion in a shifting or serpentine fashion.  | 2            |
|              | Tense             | Body is arched or rigid.  | 2            |
|              | Shivering         | Body is shuddering or shaking involuntarily.  | 2            |
|              | Upright           | Child is in a vertical or upright position.   | 2            |
|              | Restrained        | Body is restrained.   | 2            |
| Touch        | Not touching      | Child is not touching or grabbing at wound.   | 1            |
|              | Reach             | Child is reaching for but not touching wound.   | 2            |
|              | Touch             | Child is gently touching wound or wound area.   | 2            |
|              | Grab              | Child is grabbing vigorously at wound.  | 2            |
|              | Restrained        | Child's arms are restrained.  | 2            |
| Legs         | Neutral           | Legs may be in any position but are relaxed; includes gentle swimming or separate-like movements. | 1            |
|              | Squirm/kicking    | Definitive uneasy or restless movements in the legs and/or striking out with foot or feet.        | 2            |
|              | Drawn up/tensed   | Legs tensed and/or pulled up tightly to body and kept there.                                      | 2            |
|              | Standing          | Standing, crouching or kneeling.  | 2            |
|              | Restrained        | Child's legs are being held down.   |              |

**RESULT****Table 2: Age range of children with upper limit exclusion method**

| Age in years | No. of children |
|--------------|-----------------|
| 0 -5         | 15              |
| 5 -10        | 24              |
| >10          | 11              |
| Total        | 50              |

\* Mean 6.95 years

**Assessments of pain intensity according to CHEOPS score.**

Each study group was assessed in one hour as A1 and B1 and A2 and B2 in two hours. In A1 all the cases had CHEOPS score six or less than six that was satisfactory postoperative pain control. In A2 twenty two out of twenty five cases had CHEOPS score six or less than six. In B1 and B2, the CHEOPS score was > 6 in twenty five out of twenty five patients. Statistically it was 100% significant. There were no major operative complications in two groups. None of the children had surgery related complications like oedema and haematoma in both the group. But Block-related complications like local oedema or haematoma were seen in one patient, out of 25(4%) cases in group A. Three patients out of twenty five patients in group A needed additional ketamine as they had movement and agitation during surgery. Mean operating time was 20± 10 min in both the group. Nausea and vomiting in recovery room was noted in 1 patient in Group A and in 5 in Group B. Only patients in Group B required additional analgesia in post operative period. The incidence of, postoperative agitation, pain and need for medications was none in group A. where as 18 patients out of 25 patients in group B had post operative pain and agitation and they had supplementary analgesia with pethidine 0.75mg/kg or ketorolac 0.5mg/kg or both. Block-related complications like local oedema or haematoma were seen in 1 Out of 25(4%) cases in group 'A'. The frequency of minor complications, such as bleeding, haematoma and minor bruising was minimal in our study. Rare major complications, such as toxic absorption of the anaesthetic or gangrene of the glans were not seen.

A reduction in the incidence of nausea and vomiting, postoperative agitation, pain and need of medications was not seen in Group A patients compared to, 18 out of 25 (72%) patients in group B patients who were needed post operative supplementary analgesia.

**DISCUSSION**

Penile nerve block is frequently used for circumcision in infant and children as the sole agent or in association with GA.<sup>3</sup> It is a safe, simple and effective procedure for decreasing postoperative pain.<sup>4,5</sup> It also reduces behavioural distress and diminishes adrenocortical stress response in children.<sup>6</sup> Successful block avoids the need for supplemental postoperative analgesia for 6 to 24 hr.<sup>7</sup> Early discharge is possible with a more rapid recovery and earlier micturition. It is demonstrated that in older children, penile nerve block may be used as the sole source of anaesthesia with a high rate of success.<sup>8</sup> This technique eliminates the risk and postoperative morbidity of GA with shorter post anaesthesia care times and an easier recovery period without nausea, vomiting or drowsiness. All these are advantages for a day-care surgery procedure.<sup>9</sup>

Penile nerve block is simple having no technical difficulties. The frequency of block-related minor complications, such as bleeding, haematoma and minor bruising were observed in some studies.<sup>10,11</sup> In our study block related complication like minor bruising was minimal. It was observed in one patient (4%) out of twenty five patients. Rare major complications, such as toxic absorption of the anaesthetic or gangrene of the glans were not seen.

Post anaesthesia care times were shorter with penile nerve group of children and there was reduction in the incidence of nausea and vomiting, postoperative agitation, pain and need for medications in penile nerve group A than GA alone in group B patients.

Reported failure rate of penile nerve with or without GA varies from 2.9 to 6.7%, and has been related to technical difficulties or failure of analgesia of the perineal nerves.<sup>8</sup> In our study 2(8%) out of 25 needed additional GA, as a reported failure in Group A. These patients were younger than those who had a successful block. This may be related to increased anxiety and fear during local anaesthesia and surgery.

**CONCLUSION**

Penile nerve block in combination with single shot ketamine and midazolam is safe and satisfactory method to provide post operative analgesia and good psychological support in children.

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