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# POST OPERATIVE ANALGESIA FOR CIRCUMCISION IN PAEDIATRIC PATIENTS IN TERTIARY CARE HOSPITAL

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**ABSTRACT:**

According to the International Association for the Study of Pain (IASP) pain is define as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. Pain is most feared symptom of disease in which person always trying to reduce and defeat since ages. In children excessive crying, restlessness anxiety leads to pain which is difficult to manage post operatively by nurses and parents. Therefore early ambulation and rapid recovery is of prime importance. There are many techniques have been recommended for anaesthetic techniques including administration of parenteral narcotics, caudal block, non steroidal anti inflammatory drugs, ring block at base of penis, topical anesthesia and dorsal nerve block. After operative local anaesthetics, often used to relieve pain are usually administered by caudal epidural injection. There is belief that suggested human child does not feel pain and it is dangerous to give powerful analgesia because of the risk of addiction to children[i]. For the treatment of post-operative pain even in the children and newborns may trigger physiologic stress response, biochemical and cause impairments in pulmonary neuro endocrinal, gastrointestinal, cardiovascular, immunological, and metabolic functions. Many anaesthetic techniques have been introduce for administration of parenteral narcotics, non steroidal anti inflammatory drugs, caudal block, ring block at base of penis, topical anesthesia and dorsal nerve block. In children rectal administration of drugs is a safe and convenient route. Acetaminophen and Diclofenac are commercially available in pediatric suppository formulation. Caudal block is very effective whereas performing a central block for minor surgery is controversial.

**Aim:** The main aim of this study is to study different method of post operative analgesia for circumcision in paediatric patients.

**Material and Methods:** The present study was carried out in the department of anaesthesia at Prakash Institute of Medical Science and Research Urun-Islampur Maharashtra. All paediatric patients which undergoing circumcision was included in this study. Total 60 paediatric patients were included in this study with the age range from 2 years to 15 years. From all the patients for the records of data as documentation was collect by physical examination, past and present history and medical assistance and investigation were taken through pre-anesthetic check-up and routine investigations were carried out. Parents of children were explained about procedures and informed consent was obtained. as per guidelines patients were kept nill by mouth (NBM) before the scheduled of surgery and were randomly allocated in the following three groups of 20 patients.

**Result:** The study was conducted in 60 children with age ranging 2 to 15 years. After initiation with general anaesthesia. Patients were given Penile block was given with Bupivacaine plain 0.5% 2 mg/kg at 2 O'clock & 10 O'clock positions at root of penis in group A. Diclofenac sodium 2- 3 mg/kg was inserted per rectally in group B and Lignocaine jelly 2%, 1-2 ml applied locally at the operative site in group C. all the patients were comparable in all groups demographically ($p > 0.05$). $O_2$ saturation was stable in the surgery in all groups ($p > 0.05$).

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**Conclusion:** Satisfactory pain relief in immediate post operative period Penile block given for 5-6 hours whereas Diclofenac sodium given for post induction shows higher pain score for initial half an hour but no need for analgesics up to 8-14 hours. Analgesic required immediate post operative period for some patients. at operative site Lignocaine jelly (2%) applied after completion of surgery provides post operative analgesia for 4- 5 hours. Therefore Diclofenac sodium suppository is superior to penile block in respect to Lignocaine jelly (2%) duration of analgesia. Hence for immediate postoperative period Lignocaine jelly or Penile block application appeared to be better in terms of low pain score.

**Keywords:** Post operative analgesia, circumcision, Lignocaine jelly, Diclofenac sodium

## Introduction

According to the International Association for the Study of Pain (IASP) pain is define as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. Pain is most feared symptom of disease in which person always trying to reduce and defeat since ages[ii]. In children excessive crying, restlessness anxiety leads to pain which is difficult to manage post operatively by nurses and parents. Therefore early ambulation and rapid recovery is of prime importance. There are many techniques have been recommended for anaesthetic techniques including administration of parenteral narcotics, caudal block, non steroidal anti inflammatory drugs, ring block at base of penis, topical anesthesia and dorsal nerve block. After operative local anaesthetics, often used to relieve pain are usually administered by caudal epidural injection[iii]. About 20 yr ago, report of survey shows that 40% experienced moderate or severe postoperative pain of paediatric surgical patients and that 75% had insufficient analgesia. From then on until the day; safe and effective techniques have been developed[iv]. From the past history children have been treated for pain and for painful procedures because of the wrong notion in which they feel or suffer pain nor responded or remembered the painful experiences to the same that adult did safety and efficacy of the analgesics may be risk of opioid induced respiratory depression the under treatment of pain in children. There is belief that suggested human child does not feel pain and it is dangerous to give powerful analgesia because of the risk of addiction to children[v]. For the treatment of post-operative pain even in the children and newborns may trigger physiologic stress response, biochemical and cause impairments in pulmonary neuro endocrinal, gastrointestinal, cardiovascular, immunological, and metabolic functions[vi]. According to the study of Finely et al there are many types of the so called "minor" surgery can cause significant pain in children and parents have a number of misconceptions concerning pain treatment[vii].

Many anaesthetic techniques have been introduce for administration of parenteral narcotics, non steroidal anti inflammatory drugs, caudal block, ring block at base of penis, topical anesthesia and dorsal nerve block. In children rectal administration of drugs is a safe and convenient route. Acetaminophen and Diclofenac are commercially available in pediatric suppository formulation[viii,ix]. Caudal block is very effective whereas performing a central block for minor surgery is controversial[x]. With use of any of available preparation of lignocaine as topical anesthesia is simple, safe and can be repeated. Penile blockade Supporter is simple and equally effective alternative[xi]. The main aim of this study is to study different method of post operative analgesia for circumcision in paediatric patients.

## MATERIAL AND METHODS:

The present study was carried out in the department of anaesthesia at Prakash Institute of Medical Science and Research Urun-Islampur Maharashtra. All paediatric patients which undergoing circumcisions were included in this study. Total 60 paediatric patients were included in this study with the age range from 2 years to 15 years. From all the patients for the records of data as documentation was collect by physical examination, past and present history and medical assistance and investigation were taken through pre-anesthetic check-up and routine investigations were carried out. Parents of children were explained about procedures and informed consent was obtained. as per guidelines patients were kept nill by mouth

(NBM) before the scheduled of surgery and were randomly allocated in the following three groups of 20 patients as follows.

Group A: patients having penile block with Bupivacaine plain 0.5% 2 mg/kg at 2O'clock &10 O'clock positions at root of penis.

Group B: Diclofenac sodium suppository 2-3 mg/kg was inserted per rectally.

Group C: At the end of operation, Lignocaine jelly 2%, 1-2 ml was applied at the site of operation.

For assessed pain in postoperatively patients a single independent blind observer by using pediatric objective pain scale in age group of 2 to 6 years and with visual analogue scale in age group of 6 to 15 years at every 10 minutes for 30 minutes; every hourly for 6 hours and then every six-hourly for 24 hours post operatively. As time from the termination of general anaesthesia Pain free period was recorded at the time the children started crying or complained of pain. Pain score of 7 or more was observed there with two successive observations of Pediatric Objective pain scale and pain score of 4 or more was observed according to Visual analogue scale. For reduce of pain the rescue analgesia in form of Acetaminophen syrup (in sugar syrup) or tablets (10-15 mg/kg) were given with the help of pain score as shown in figure below.

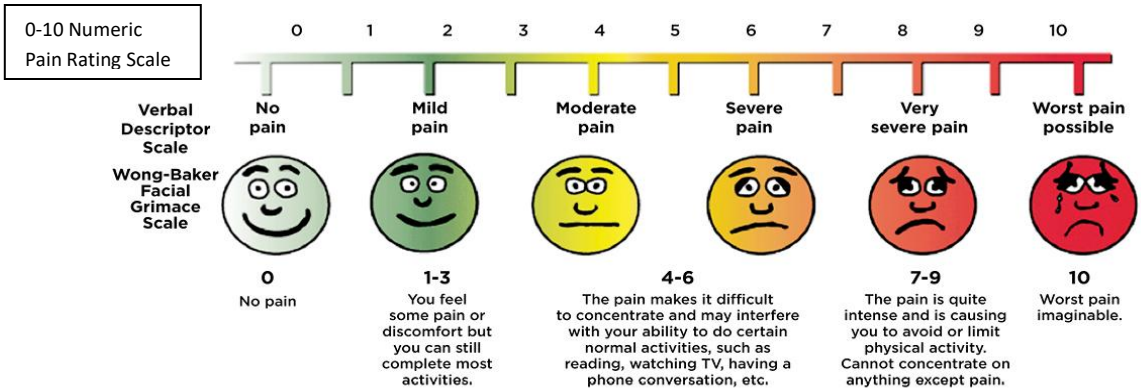


**Figure 1: pain scale chart showing the various levels that define the 0 to 10 pain scale.**

## OBSERVATION AND RESULT:

The study was conducted in 60 children with age ranging 2 to 15 years. After initiation with general anaesthesia. Patients were given Penile block was given with Bupivacaine plain 0.5% 2 mg/kg at 2 O'clock & 10 O'clock positions at root of penis in group A. Diclofenac sodium 2- 3 mg/kg was inserted per rectally in group B and Lignocaine jelly 2%, 1-2 ml applied locally at the operative site in group C. all the patients were comparable in all groups demographically ($p > 0.05$). $O_2$ saturation was stable in the surgery in all groups ($p > 0.05$).

**Table 1: observing pain score with the help of Pain Scale for Patients < 6 Year of Age**

| Time | Group A | Group B | Group C |
|---|---|---|---|
| | Pain score | Pain score | Pain score |
| 10 mins | 0 | 0 | 0 |
| 20 mins | 0 | 0.8 | 0.5 |
| 30 mins | 1 | 1 | 1.4 |
| 1Hours | 1.5 | 2 | 3 |
| 2 Hours | 2 | 2.7 | 4 |
| 3 Hours | 3 | 3 | 5 |
| 4 Hours | 4 | 3.9 | 6.5 |
| 5 Hours | 5 | 4.8 | 6.5 |
| 6 Hours | 6 | 5 | 8 |
| 12 Hours | - | 6.5 | - |

In post operative period pain score in group B was 0.4 ± 0.7 compared to 0.06 ± 0.5 in group C and 0 in group A whereas difference was not significant (P>0.05). in first half an hour after surgery there was mild pain in group B (1.8 ± 0.4) and in group C (1.0± 1.5) but no rescue analgesia was required.

Surgery up to 5 hours pain score remained significantly higher in group C (mean pain score ~ 4.9) compared to group A (mean pain score ~ 2.7) & group B (mean pain score ~ 3.3), no rescue analgesia was required (P<0.05).

Mean time for rescue analgesia was at 6 hrs in group A (mean pain score 6.0 ± 1.0), at 12 hrs in group B (mean pain score 6.50 ± 0.5) and at 5 hrs in group C (mean pain score 6.5 ± 1.5).

**Table 2: Observing Pain Score with the Help of Visual Analogue Scale for Patients ≥ 6 Year of Age**

| Time | **Group A** | **Group B** | **Group C** |
|---|---|---|---|
| | **Pain score** | **Pain score** | **Pain score** |
| 10 mins | 0 | 0 | 0 |
| 20 mins | 0.3 | 0.3 | 0 |
| 30 mins | 0.5 | 0.4 | 0 |
| 1Hours | 0.5 | 0.5 | 0.5 |
| 2 Hours | 0.8 | 0.8 | 1.5 |
| 3 Hours | 1.4 | 1 | 2.5 |
| 4 Hours | 1.6 | 1.5 | 3 |
| 5 Hours | 2.5 | 2 | 3.5 |
| 6 Hours | 3.5 | 2.5 | 4 |
| 12 Hours | 4 | 3.5 | - |

In post operative period Comparing VAS pain score in group B was 0.2 ± 0.3 as compared to 0.8 ± 0.3 in group A and 0 in group C which was not significant (P>0.05).

In first half an hour after surgery There was mild pain in group A (0.5 ± 1.1) and in group B (0.4 ± 0.5) but no rescue analgesia was required. In group C (0) no pain observed. Pain score remained after two hours of surgery significantly higher in group C (mean pain score ~ 2.6) as compared to group A (mean pain score ~ 1.5) & group B (mean pain score ~ 1.3) there was no rescue analgesia was required (P<0.05). In group A at 6 hrs Mean time for rescue analgesia was (mean pain score 3.2 ± 0.7), at 12 hrs in group B (mean pain score 3.4 ± 0.5) and at 4 hrs in group C (mean pain score 3.0 ± 0.9).

**Table 3: Duration of Analgesia**

| TIME | GROUP A (MEAN ±SD) | GROUP B (MEAN ±SD) | GROUP C (MEAN ±SD) | P VALUE |
|---|---|---|---|---|
| DURATION (HOURS) | 6.8 ± 2.1 | 12.4 ± 1.7 | 4.2 ± 0.9 | P < 0.05 |

The average effective pain free period in group A(Penile block) was 6.8 ± 2.1 hours , in group B (Diclofenac sodium suppository) was 12.4 ± 1.7 hours and in group C (Lignocaine jelly) was 4.2 ± 0.9 hours. The difference was highly significant among all three groups (P < 0.001). Suppository the duration of analgesia was significantly longer time with Diclofenac sodium.

**Table 4: Side Effects**

| **PARTICULARS** | GROUP A | GROUP B | GROUP C |
|---|---|---|---|
| **NO ORAL INTAKE** | NIL | NIL | NIL |
| **VOMITING** | NIL | NIL | NIL |
| **NOT ABLE TO PASS URINE** | NIL | NIL | NIL |
| **ALLERGIC REACTION** | NIL | NIL | NIL |
| **DISTURBED SLEEP** | NIL | NIL | NIL |
| **ABSENT NORMAL MOBILITY** | NIL | NIL | NIL |
| **HEMATOMA** | NIL | NIL | NIL |

In any group none of the patients had any complications like vomiting, disturbed sleep, allergic reaction, difficulty in micturition, absence of normal mobility or hematoma at site of injection.

## DISCUSSION:

Nowadays for anesthesiologists postoperative pain relief has become most important concern particularly in paediatric age group. Due to fear of pain which can lead to physiological and psychological effects along with long term post-operative disturbances like crying, aggression, regressive behavior, poor bladder control, eating and sleeping problems in children. To relieve pain and avoid all these consequences various pharmacological researched have been going on. Compared the effect of penile block, Diclofenac sodium suppository & Lignocaine jelly for post-operative analgesia, after circumcision in paediatric patients are studied in this study. According to study of Frederick et.al. penile block with Bupivacaine 0.5 % for postoperative pain relief in all types of penile surgery. Penile block + GA were received by one group and only general anaesthesia was received by another group. Therefore penile block preclude need for analgesia within first 6 hours which is similar to this study[xii].
Studied of Dalensa B et.al. patients were given penile block via sub pubic space using 0.2 ml/kg of 1% Lidocaine plain for Group A and 0.5% Bupivacaine for Group B. According to them 0.5% Bupivacaine provided significantly longer postoperative analgesia. (~24 hours) where as in this study Bupivacaine (0.5%) had effective analgesia for 6-8 hours[9]. As studied of P.M.Yeoman et. Al. prospective blind trial to compare the analgesic effect of caudal block and dorsal nerve block of penis undergoing elective circumcision. Effect of the effect of both types of block appeared to wane after 3 to 4 hours which were co-inside with present study[xiii].
Thara Tree - Trakarn et al evaluated the efficacy of repeated application of lignocaine jelly in obviating post circumcision pain. Studied concluded that repeated used of lignocaine jelly on the circumcision was highly effective, safe and convenient method to post-circumcision pain in children during the early post operative period which was comparable to this study as duration of analgesia with lignocaine jelly was 4-5 hours[xiv].

## CONCLUSION:

Satisfactory pain relief in immediate post operative period Penile block given for 5-6 hours whereas Diclofenac sodium given for post induction shows higher pain score for initial half an hour but no need for analgesics up to 8-14 hours. Analgesic required immediate post operative period for some patients. at operative site Lignocaine jelly (2%) applied after completion of surgery provides post operative analgesia for 4- 5 hours. Therefore Diclofenac sodium suppository is superior to penile block in respect to Lignocaine jelly (2%) duration of analgesia. Hence for immediate postoperative period Lignocaine jelly or Penile block application appeared to be better in terms of low pain score.

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