

## Comparative Study of Preoperative Biateral Infraorbital Nerve Block with Peri Inscisional Infiltration for Post Operative Pain Relief in Cleft Lip Surgery

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### Abstract

**Background:** Post operative pain relief is an integral part of anaesthetic management especially when it comes to pediatric patients where it requires special attention. **Aim:** to study two different techniques – peri incisional infiltration with bilateral infra orbital nerve block for post operative pain relief in case of cleft lip repair surgery done in pediatric patients below two years of age for pain relief in post operative period. **Material and Methods:** Sixty patients of either sex were randomly divided in two equal groups with comparable age and weight with duration of surgery lasting around 75 to 90 minutes – one to receive Inj. Bupivacaine 0.25% 1 ml for infraorbital nerve block each side and other for peri incisional infiltration with Inj. Bupivacaine 0.25% 2 ml. After premedication with anticholinergics, general anaesthesia was given with Inj. Ketamine and relaxant Inj. Suxamethonium as per body weight. And bilateral infra orbital nerve block and peri incisional infiltration was done after intubation. The patients were monitored for vitals, pain relief using Objective Pain Score (Hanallah's) for pain free period post operatively at the interval of 2, 4, 6, 8, 10, 14, 24 hours. **Results:** The basic vital

parameters were comparable in both groups and were well within normal range pre and post operatively. Hanallah's paediatric objective pain score [6] at the interval of 2, 4, 6, 8, 10, 14, 24 hours post operatively showed that the average pain relief in infraorbital nerve block group was around  $23.12 \pm 2.21$  hours as compared to  $16.33 \pm 1.73$  hours in the peri incisional group. The use of rescue analgesia was also earlier in the peri incisional group. **Conclusion:** Both techniques are effective in providing good pre operative and post operative analgesia but bilateral infra orbital nerve block provides a better relief for longer duration avoiding the use of early rescue analgesia.

**Keywords:** Infra Orbital Nerve Block; Peri Inscisional Infiltration; Objective Pain Score.

### Introduction

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage [1]. Amongst this postoperative pain is still the most under treated. In pediatric patients this again is a complex issue as to whether the restlessness and crying in due to fear, hunger or postoperative pain.

Anaesthetists are the best in this field to intervene in this pain management and help in to break the myriad physiologic response to stress caused by pain.

Cleft lip is commonest congenital craniofacial abnormality with incidence as high as 1:7000. The surgery performed to correct this deformity is usually done in early ages so as to prevent disfigurement and other problems if done later in life. This surgery is actually associated with appreciable post operative pain and treating it is a vital part of peri-operative care as well as providing a postoperative pain free period.

Bilateral infraorbital nerve block with local anaesthetics for alleviating pain has attracted attention these days (Daftary Swati et al 2004) [1] (Prabhu K et al 1999) [2] and it has been found to be more effective than peri incisional infiltration of local anaesthetics. The plasma protein

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Received on 13.03.2017

Accepted on 25.03.2017

concentrations particularly alpha 1-acidglycoprotein responsible for binding of bupivacaine is three times lower which allows more drug to stay free and active.

Keeping this in consideration a randomized prospective study in 60 pediatric patients of either sex with age up to 2 years of ASA risk of anaesthesia up to II was taken up comparing bilateral infraorbital nerve block and peri inscisional infiltration with Inj. Bupivacaine hydrochloride in addition to general anaesthesia for pre operative analgesia and post operative pain relief.

## Methods

The study was conducted in 60 ASA grade I and II patients below two years of age of either sex undergoing cleft lip repair surgery. The exclusion criteria being patients with history of allergic reaction to local anaesthetic drugs, bleeding diathesis, local sepsis and patients with ASA III and above.

*Patients were Randomly Allocated to one of the Following Groups*

Group I (n=30): to receive bilateral infra orbital nerve block (standard technique) with 1 ml of Inj. Bupivacaine 0.25% with adrenaline 5µg/ml each side

Group P (n=30): to receive peri inscisional

infiltration with same solution as used in Group I.

After proper anaesthetic check up to rule out exclusion, proper informed consent from parents regarding the procedure and study of objective pain relief score post operatively, fasting of around 4-6 hours, patients were premedicated with Atropine 0.03mg/kg per oral. They were subjected to general anaesthesia with Inj. Ketamine 1-2mg/kg intravenously and intubated with RAE tube of appropriate size after Inj. Suxamethonium 2 mg/kg intravenously. After proper packing of airway and confirming equal air entry bilaterally the patients were either subjected to receive either Bilateral infra orbital nerve block (group I) or peri inscisional infiltration (group P).

Blood pressure, pulse rate, oxygen saturation were observed for every 1, 5, 10, 20, 30, 40, 60, 75, 90, 105 min till the end of surgery. Intraoperatively patients were observed for any complications like hematoma, hypotension and arrhythmias. Analgesics were not administered pre and post operatively.

Post operatively the patients were observed for vital parameters and any complications every two hourly for first twenty four hours.

Post operative pain relief was observed using an objective pain relief Hanallah's score every two hours for first twenty four hours. Rescue analgesia of Syrup Paracetamol 5mg/kg per oral was given if the pain score was found to be  $\geq 4$ .

*Hanallah's Objective Pain Scale (ops) [6]*

| Blood Pressure (mm Hg) | 0<br>>10% of preoperative BP | 1<br>>20% of preoperative BP | 2<br>>30% of preoperative BP |
|------------------------|------------------------------|------------------------------|------------------------------|
| Crying                 | No crying                    | Crying but consolable        | Crying and not consolable    |
| Movement               | None                         | Restless                     | Thrashing                    |
| Anxiety                | Asleep/ calm                 | Mild                         | Hysterical                   |
| Posture                | No specific                  | Flexing legs and thigh       | Holding groin/ throat        |
| c/o pain               | Asleep / no pain             | Cannot localize              | Can localize                 |

## Results

The mean age, sex and body weight in the two

groups were statistically similar.

The two groups were also comparable as to the duration of surgery.

**Table 1:** Demographic data

|                   | Group I     | Group P    | p value |
|-------------------|-------------|------------|---------|
| Age (months)      | 16.03±3.54  | 15.61±6.64 | p>0.05  |
| <b>Sex</b>        |             |            |         |
| Male              | 20 (66%)    | 22 (73.3%) | p>0.05  |
| Female            | 10 (33.33%) | 8 (26.6%)  | p>0.05  |
| Weight            | 9.43±2.25   | 9.67±2.39  | p>0.05  |
| <b>ASA status</b> |             |            |         |
| I                 | 28 (93.3%)  | 27 (90%)   | p>0.05  |
| II                | 2 (6.6%)    | 3 (10%)    | p>0.05  |

**Table 2:** Duration of surgery

| Time (Hours) | Group I   | Group P   | p value |
|--------------|-----------|-----------|---------|
| Mean ± SD    | 1.42±0.09 | 1.35±0.03 | p>0.05  |

The difference of was statistically insignificant in both groups (p>0.05)

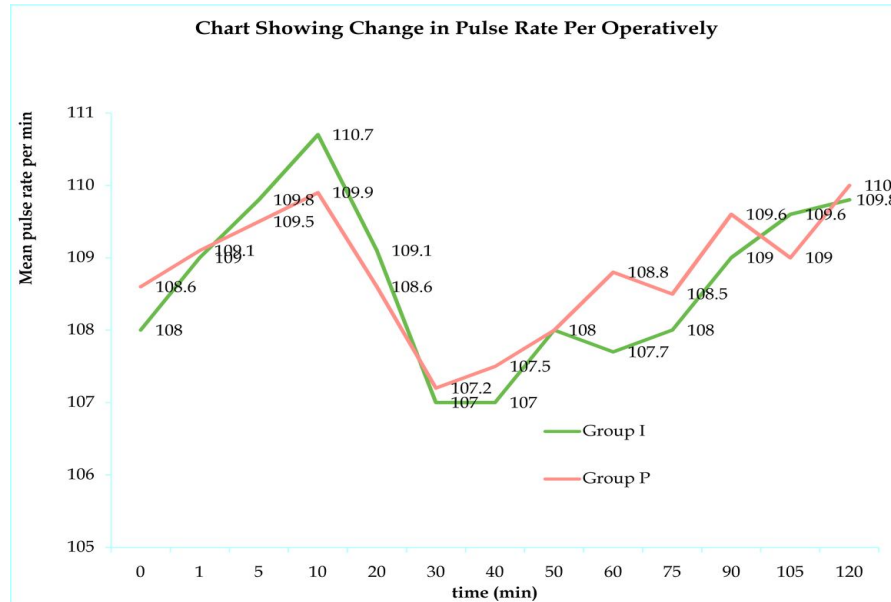
**Table 3:** Hemodynamics preoperative

|                    | Group I     | Group P     | p value |
|--------------------|-------------|-------------|---------|
| Pulse rate (min)   | 108.11±6.66 | 108.61±6.01 | p>0.05  |
| SBP mm Hg          | 108.6±4.93  | 108.0±03.75 | p>0.05  |
| SpO <sub>2</sub> % | 98.73±0.44  | 98.70±0.45  | p>0.05  |

The preoperative pulse rate, systolic blood pressure (SBP) and SpO<sub>2</sub> % were statistically comparable.

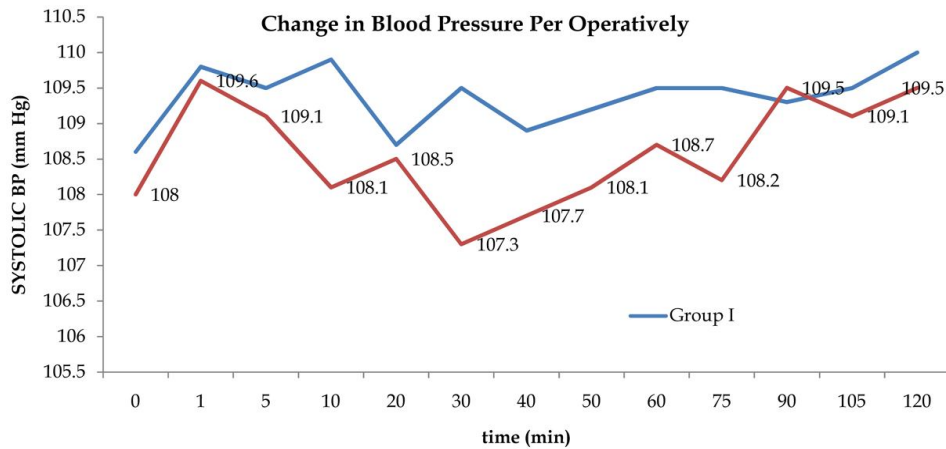
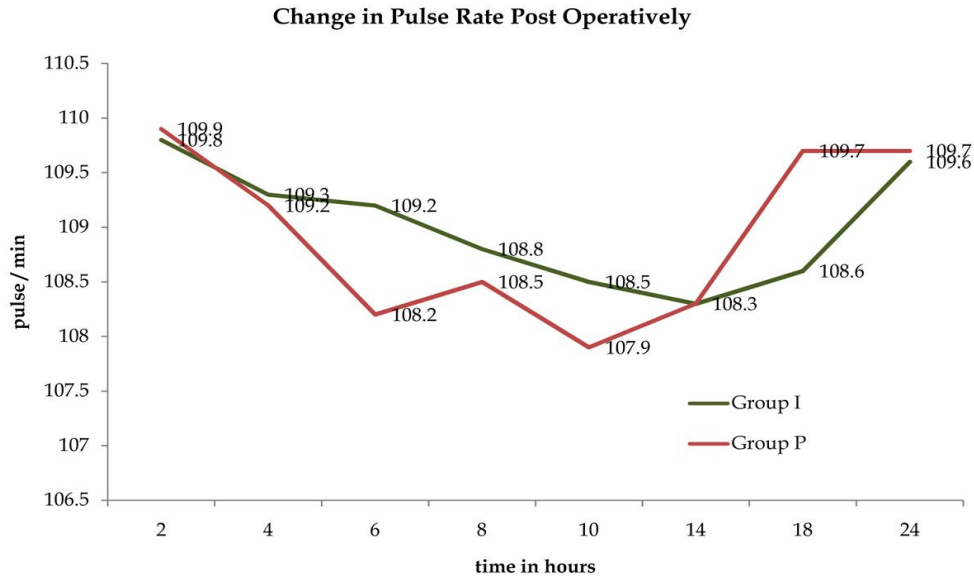
**Table 4:** Intraoperatively Pulse rate (per min)

| Time (min) | Group I     | p value (intra group) | Group P     | p value (intra group) |
|------------|-------------|-----------------------|-------------|-----------------------|
| 0          | 108.11±6.66 | >0.05                 | 108.61±6.01 | >0.05                 |
| 1          | 109.01±5.34 | >0.05                 | 109.10±4.22 | >0.05                 |
| 5          | 109.8±4.95  | >0.05                 | 109.45±5.34 | >0.05                 |
| 10         | 110.7±4.66  | >0.05                 | 109.9±4.55  | >0.05                 |
| 20         | 109.1±4.66  | >0.05                 | 108.66±4.34 | >0.05                 |
| 30         | 107±4.23    | >0.05                 | 107.2±4.23  | >0.05                 |
| 40         | 107.3±.90   | >0.05                 | 107.24±3.99 | >0.05                 |
| 50         | 108±2.75    | >0.05                 | 108.21±2.98 | >0.05                 |
| 60         | 107.7±2.67  | >0.05                 | 108.78±2.88 | >0.05                 |
| 75         | 108.2±2.66  | >0.05                 | 108.45±3.20 | >0.05                 |
| 90         | 109±2.98    | >0.05                 | 109.66±3.10 | >0.05                 |
| 105        | 109.6±2.46  | >0.05                 | 109.12±2.34 | >0.05                 |
| 120        | 109.8±2.52  | >0.05                 | 109.9±3.21  | >0.05                 |

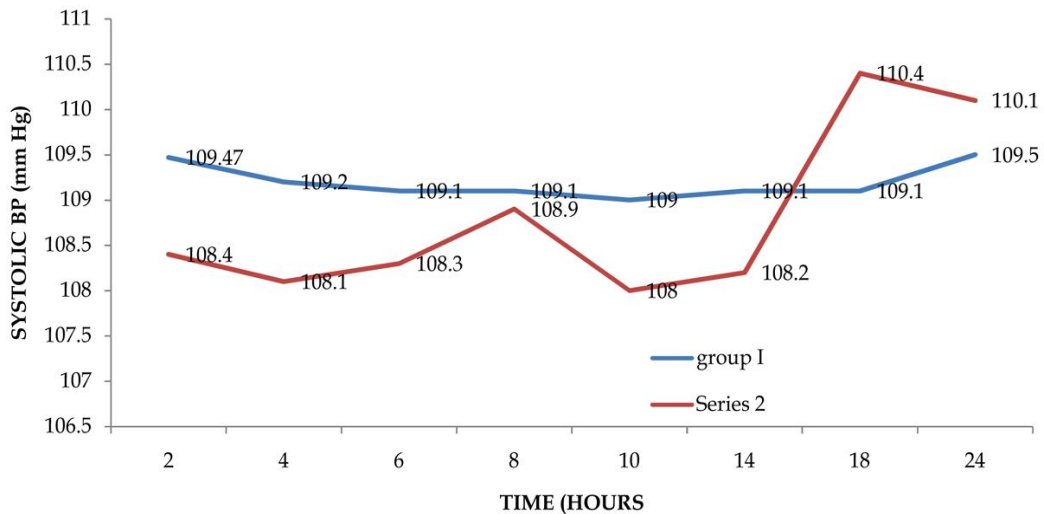


**Table 5:** Post operatively Pulse rate

| Time (Hours) | Group I    | p value (intra group) | Group P     | p value (intra group) |
|--------------|------------|-----------------------|-------------|-----------------------|
| 2            | 109.8±2.52 | >0.05                 | 109.9±3.21  | >0.05                 |
| 4            | 109.3±2.32 | >0.05                 | 109.19±2.35 | >0.05                 |
| 6            | 109.2±2.40 | >0.05                 | 108.12±2.34 | >0.05                 |
| 8            | 108.8±2.34 | >0.05                 | 108.51±2.99 | >0.05                 |
| 10           | 108.5±2.10 | >0.05                 | 107.9±2.73  | >0.05                 |
| 14           | 108.3±2.12 | >0.05                 | 1.8.29±2.61 | >0.05                 |
| 18           | 108.6±2.13 | >0.05                 | 1.9.74±2.43 | >0.05                 |
| 24           | 109.6±2.15 | >0.05                 | 1.9.67±2.33 | >0.05                 |



**Table 6:** Intraoperative Blood Pressure



There was no significant change in mean Systolic Blood pressure from its pre operative value in either of the groups ( $p > 0.05$ )

**Table 8:** Objective Pain Score : Group I

| Time (hours) | 0  | 1 | 2 | 3  | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|----|---|---|----|---|---|---|---|---|---|----|
| 2            | 30 | - | - | -  | - | - | - | - | - | - | -  |
| 4            | 30 | - | - | -  | - | - | - | - | - | - | -  |
| 6            | 30 | - | - | -  | - | - | - | - | - | - | -  |
| 8            | 30 | - | - | -  | - | - | - | - | - | - | -  |
| 10           | 30 | - | - | -  | - | - | - | - | - | - | -  |
| 14           | 30 | - | - | -  | - | - | - | - | - | - | -  |
| 18           | 26 | 2 | - | -  | 2 | - | - | - | - | - | -  |
| 24           | -  | - | - | 28 | 2 | - | - | - | - | - | -  |

**Table 9:** Objective Pain Score: Group II

| Time (hours) | 0  | 1 | 2 | 3 | 4 | 5 | 6  | 7 | 8 | 9 | 10 |
|--------------|----|---|---|---|---|---|----|---|---|---|----|
| 2            | 30 | - | - | - | - | - | -  | - | - | - | -  |
| 4            | 30 | - | - | - | - | - | -  | - | - | - | -  |
| 6            | 30 | - | - | - | - | - | -  | - | - | - | -  |
| 8            | 30 | - | - | - | - | - | -  | - | - | - | -  |
| 10           | 30 | - | - | - | - | - | -  | - | - | - | -  |
| 14           | 21 | 4 | - | - | - | 5 | -  | - | - | - | -  |
| 18           | -  | - | - | - | - | - | 28 | 2 | - | - | -  |
| 24           | -  | - | - | - | - | - | -  | - | - | - | -  |



**Picture 1:** Technique of infra orbital nerve block

In the above tables it is clear that at the end of 14 hours, all the patients in Group I has OPS – 0 where as it was 1 in 4, 5 in 5 patients in group P and at the end of 18 hours only 2 patients has OPS 1 and 2 patients have OPS 4 in group I where as it was >4 in

all patients of Group P, also at the end of 24 hours OPS ≥4 in 2 patients in Group I.

This shows prolonged analgesia in group I as compared to group P.

*Mean Duration of Post Operative Analgesia*

|                       | Group I    | Group P    | p value |
|-----------------------|------------|------------|---------|
| Duration of analgesia | 23.12±2.21 | 16.33±1.73 | <0.01   |

This shows highly significant statistical difference between the two groups, the duration of analgesia in group I was significantly more than group P. this

shows that bilateral infra orbital nerve block seems to be better for prolonged analgesia in cases of cleft lip surgery.

*Requirement of First Rescue Analgesia Dose*

| Time (hours) | Group I (no. of patients) | Group P (no. of patients) |
|--------------|---------------------------|---------------------------|
| 2            | -                         | -                         |
| 4            | -                         | -                         |
| 6            | -                         | -                         |
| 8            | -                         | -                         |
| 10           | -                         | -                         |
| 14           | -                         | 5                         |
| 18           | 2                         | 25                        |
| 24           | -                         | -                         |

This table shows that requirement of first dose of rescue analgesia started after 14 hours in group P as compared to Group I where it started after 18 hours. It is clear from the table that only two patients in group I required analgesia at the end of 18 hours while 28 patients were pain free even at the end of 24 hours.

## Discussion

Management of post operative pain in children is fraught with problems of poor communication, children fear of strangers and injections whereas physicians fear of drug toxicity. Assessment of pain and thereby its relief does pose a challenge to the clinician. Various modalities are incorporated to alleviate pain in children and each have its merits and demerits [5]. General measures like proper counseling, making child comfortable, use of systemic drugs; regional nerve blocks are all being used for pain relief. Regional blocks along with general anesthesia are gaining popularity for management of pre and post operative pain in children as it ensures decreased stress response, pain free awakening and avoidance of potentially deleterious side effects of parentally administered drugs.

Bilateral infra orbital nerve block used in this study has gained popularity [4] amongst physicians as it provides sensory blockade of upper lip, side of nose, mucous membrane, lining of nasal vestibule and skin of the lower eyelids. Daftary Swati et al [1] (July 2004) had conducted a similar study and were of opinion in favour of infraorbital nerve block which provided better pain relief. Prabhu Kumar et al (1999) [2] also were of same opinion when using bilateral infraorbital nerve block for post operative pain relief for cleft lip surgeries.

In our study using Inj. Bupivacaine 0.25% with adrenaline was done to prolong the duration of action. After giving general anesthesia and intubation the patients with RAE endotracheal tube, patients were subjected either to receive Bilateral infra orbital nerve block or peri inscisional infiltration before surgery and they surgery was allowed. Balanced depth of anesthesia was maintained and no significant hemodynamic disturbances were observed in either group.

Various objective pain scores (OPS) are used to

assess the pain relief in pediatric patients. Hanallah's OPS was used to judge the pain relief. Parents were counselled before surgery and their cooperation in the postoperative period was indeed of great help in assessing the pain scores. It was found that the duration of analgesia was indeed significantly higher in the group receiving infra orbital nerve blocks ( $23.12 \pm 2.21$ ) as compared to the group receiving peri inscisional infiltration ( $16.33 \pm 1.73$ ). This also reduced the requirement of rescue analgesia which was first used at the end of 14 hours in group P as compared to group I where only 2 patients required rescue analgesia at the end of 18 hours.

So it is quite apparent that use of peripheral regional blocks does play a significant role in providing post operative pain relief especially in pediatric patients. Here bilateral infra orbital nerve blocks provided better and prolonged pain relief in cleft lip surgery patients as compared to the peri inscisional infiltration.

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