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COMPARATIVE STUDY BETWEEN BILATERAL SUPRAZYGOMATIC MAXILLARY NERVE BLOCKS VERSUS PALATINE NERVES BLOCKS IN PEDIATRIC PATIENTS UNDERGOING CLEFT PALATE REPAIR

By

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ABSTRACT

Background: Cleft palate is one of the most common craniofacial malformations which requires early surgical intervention to allow proper feeding and phonation. Anesthesia for cleft palate surgery in infant and children carries a higher risk with general anesthesia and airway complications. Administration of opioids, often needed for intra- and postoperative analgesia, increases the risk of airway obstruction and ventilator control dysfunction.

Objective: To compare the effectiveness of bilateral suprazygomatic maxillary nerve blocks (SMB) versus bilateral blocks of greater palatine, lesser palatine and nasopalatine nerves on the postoperative opioids consumption and time to first need of analgesia.

Patients and methods: Three hundred and fifty child older than one year and less than five years who were scheduled for cleft palate surgery, and divided into 2 equal groups: maxillary group received standardized general anesthesia, then bilateral SMB using 0.25% bupivacaine 0.15 ml/kg with maximum dose 3mg/kg, and palatine group received standardized general anesthesia, then greater palatine, lesser palatine, and nasopalatine nerves had been blocked bilaterally using 0.5 ml bupivacaine 0.25% at each point with a total volume of 2.5 ml bupivacaine 0.25%. Postoperative rescue analgesia was administered after patient evaluation and pain assessment in the form of 100 µg/kg of nalbuphine. The two groups were compared as regard time to first analgesia given to the patient and total amount of postoperative nalbuphine consumption over the postoperative 24 hours. Also, they were compared for pain score, hemodynamic changes, block related complications, and parents' satisfaction. This study was done at Al-Azhar University Hospitals after approval of the medical ethical committee, from March 2019 till May 2021.

Results: Maxillary group has less analgesic consumption with no statistically significant difference. However, the time to first rescue analgesia was significantly more in the maxillary group patients.

Conclusion: SMB prolonged the duration of post-operative analgesia and decreased rescue analgesic consumption with no statistically significant difference compared to palatal block with no increases in adverse effects.

Keywords: Bupivacaine; cleft palate; maxillary nerve block; palatal nerves block; pediatrics.

INTRODUCTION

Globally, clefts incidence is (0.5-2) per 1,000 births depending on the population group *(Liau et al., 2010)*.

Cleft palate is one of the most common craniofacial malformations which has a huge impact on the life of an individual and family with a significant incidence in Egypt *(Alswairki et al., 2019)*.

Greater palatine (GP) nerve innervates the posterior part of the hard palate, lesser palatine (LP) nerve supplies the soft palate and nasopalatine (NP) nerve supplies the soft and hard tissues of the palate from canine to canine. Post palatoplasty analgesia can be successfully achieved by blocking these nerves *(Jonnavithula et al., 2010)*.

Successful use of maxillary nerve block by the suprazygomatic approach has been reported in children undergoing cleft palate surgery *(Mesnil et al., 2010)*.

Early surgical intervention for cleft palate (CP) repair is essential for proper feeding and phonation as well as reduction of complications such as frequent sinusitis and other respiratory tract infections. Anesthesia for cleft palate surgery in infants and children carries a higher risk with general anesthesia and airway complications due to associated respiratory problems. The risk of postoperative airway obstruction and/or respiratory depression is high and requires vigilant monitoring, particularly during the first 24 hours postoperatively *(Chiono et al., 2014)*.

Nalbuphine is an agonist-antagonist opioid that has analgesic and sedative effects, and because of the ceiling effect, it does not cause respiratory depression. In the perioperative therapy of pediatric patients, it can be used for premedication, sedation during diagnostic procedures, and postoperative pain treatment. Nalbuphine reverses the adverse reactions of other opioids (e.g., itching, urine retention) without significantly influencing its analgesic properties. Following sevoflurane anesthesia in small children, it reduces the incidences of agitation. Nalbuphine is considered to be a safe drug and one that causes fewer instances of nausea and vomiting compared with other opioids. Its analgesic effect, combined with its ability to provide moderate sedation with a large margin of safety, makes it the most frequently used analgesic in pediatric patients *(Anna and Marzena 2015)*.

Nalbuphine is a nearly ideal opioid for efficient and safe pediatric perioperative pain therapy due to its unique pharmacological properties as a μ-receptor antagonist, κ-receptor agonist and a high safety profile. Nalbuphine is used clinically primarily in postoperative pain therapy administered as a bolus, continuous infusion and patient-controlled analgesia. Furthermore, it is administered in different regimens for pediatric diagnostic and interventional sedation *(Schultz et al., 2014)*.

It has been suggested in various studies that the opiate agonist/antagonist nalbuphine provides effective reversal of the respiratory depression after fentanyl while maintaining postoperative analgesia. By acting on μ1 and μ2 receptors, fentanyl is a stronger agonist than nalbuphine to produce analgesia and respiratory depression, and by acting on kappa receptors, nalbuphine may provide better

effects of analgesia and sedation *(Chen et al., 2020)*.

This study aimed to compare the effectiveness of bilateral suprazygomatic maxillary nerve blocks (SMB) versus bilateral blocks of greater palatine, lesser palatine and naso palatine nerves on the postoperative opioids consumption in pediatric patients undergoing cleft palate repair.

PATIENTS AND METHODS

Three hundred and fifty patients of both sexes, scheduled for cleft palate repair under general anesthesia were enrolled in this controlled prospective randomized double-blind study after approval of the medical ethical committee at Al-Azhar University Hospitals, Department of Anesthesia, and after parental informed consents.

The study was performed from March 2019 to May 2021. Patients were randomly divided into two equal groups:

Maxillary group: Patients received standardized general anesthesia, then bilateral SMB using 0.25% bupivacaine 0.15 ml/kg with maximum dose 3mg/kg.

Palatine group: Patients received standardized general anesthesia, then greater palatine, lesser palatine and nasopalatine nerves had been blocked bilaterally using 0.5 ml bupivacaine 0.25% at each point, with a total volume of 2.5 ml bupivacaine 0.25%.

Inclusion Criteria: Pediatric patients of both sexes aged 1-5 years, of ASA classes I and II, scheduled for cleft palate repair.

Exclusion Criteria: Lack of parental consent, patients with known hypersensitivity to study drugs, or infection at the site of injection, coagulopathy, cardiorespiratory anomalies, patients received preoperative analgesics, and inability to use the pain scoring system.

Evaluation and preparation: On the day before surgery, evaluation was carried out through history taking, clinical examination, needed laboratory investigations and investigations to exclude other congenital anomalies. Every patient's parents received a thorough explanation for the purpose of the study, and expected complications during the preoperative visit. Children were pre medicated with oral midazolam (0.5 mg/kg) 30 minutes prior to surgery. Multichannel monitor was attached to the patient to display ECG (lead II), heart rate (beats/min), non-invasive arterial blood pressure (mmHg) and oxygen saturation (SpO2).

General Anesthesia Technique: General anesthesia was induced in all children using inhalation of 4–6% sevoflurane, intravenous fentanyl (1 μg/kg) and atracurium (0.5 mg/kg) to facilitate endotracheal intubation. After endotracheal intubation, mechanical ventilation was initiated and ventilator parameters were adjusted according to patient’s age so that PECO2 was maintained at 35 ± 2 mmHg. Anesthesia was maintained with inhalation of sevoflurane 2.0% in 100% oxygen and atracurium (0.1mg/Kg, IV) on demand to maintain muscle relaxation. At the end of opertation, sevoflurane was discontinued and muscle relaxant was reversed by Neostigmine 0.05 mg/kg, and Atropine 0.02 mg/kg then each patient was extubated after taking good regular tidal

volume and recovery of airway protective reflexes.

Technique of suprazygomatic maxillary nerve block: The suprazygomatic maxillary nerve block was performed with a 27-gauge 38-mm needle following aseptic preparation of the skin. The needle inserted perpendicularly at the angle between the posterior orbital rim and the superior border of the zygomatic arch. After contacting the greater wing of the sphenoid (about 20mm deep), the needle then partially withdrawn, reoriented approximately 20° anterior and 10 ° inferior, and advanced 35 to 38mm to direct the needle into the pterygopalatine fossa. Following a negative aspiration test, 0.15 ml/kg of local anesthetic consisting of bupivacaine 0.25% was injected bilaterally then compression on area of injection for few minutes to avoid hematoma formation.

Technique for palatal block: Greater palatine, lesser palatine and naso palatine nerves were blocked bilaterally at their corresponding foraminae. Identifying the greater palatine (GP) foramen, situated at the junction of alveolar and palatine bone, A 23G needle was used to block greater palatine nerve bilaterally just anterior to the GP foramen by injecting 0.5 ml local anesthetic solution 1 cm medial to 1st / 2nd maxillary molar at a depth < 1 cm without entering the canal. Half ml of local anesthetic solution was injected bilaterally to block lesser palatine nerve at the lesser palatine foramen, identified just lower and lateral to GP foramen, at a depth of less than 1 cm. Nasopalatine nerve was blocked lateral to the incisive papilla using 0.5 ml of the solution at a depth of<1 cm. In case of a complete cleft, the block was performed at the incisive papilla as the vessels will be emerging from the incisive foramen.

No sub mucosal or peri-incisional local anesthetic infiltration was administered. Needle entry point at suprazygomatic fossa was covered with a small piece of tape in both groups for blinding. Patients' parents, nurses, were blinded to the type of block performed during the procedure. The blocks were done by an independent anesthesiologist not providing the anesthesia. Also, data collection postoperatively was performed.

The following parameters were assessed: Patient demographic data (including age, sex, and weight).Vital signs (HR, ABP, Spo2) were recorded before induction of anesthesia, every 15 minutes intraoperatively and in PACU, then every 4 hours during the first 24 postoperative hours. We recorded children and infants postoperative pain scale (CHIPPS) score for pain assessment on admission to PACU and at 1, 2, 4, 6, 8, 12, 18 and 24hours post-operatively. The score consisted of 5 points; crying, facial expression, posture of the trunk, leg posture and motor restlessness each scored from 0 to 2 with a total score of 0–10. Intraoperative and postoperative analgesia, technique related complications, and parents' satisfaction score were also recorded.

Postoperative rescue analgesia was administered after patient evaluation, and pain assessment (CHIPPS score >3/10) in the form of 100 µg/kg of nalbuphine, and was repeated after 15minutes until the pain score was 3/10 or less. Time to first analgesia given to the patient (rescue analgesia), and total amount of

postoperative nalbuphine consumption was collected and recorded at the end of the 24 postoperative hours.

Statistical analysis: The number of patients required in each group was determined after a power calculation according to data obtained from previous study; *Gaston et al.* depending on the consumption of postoperative opioids analgesia. In that study the percentage of patients required post-operative opioids was 35% and 21.4% for maxillary and palatine groups respectively. A sample size of 174 patients in each group was required to provide 80% power using G Power 3.1.9.2 software. We used the statistical package for the social sciences (SPSS) version 24 for analyzing the data (SPSS, Armonk, NY: IBM Corp, USA). Quantitative data were expressed as mean± standard deviation (SD), median and interquartile range (IQR). Qualitative data were expressed as frequency and percentage. Kolmogrov-Semornov test was used to assess the normality of distribution of numerical data; chi square test was used to test the association between categorical variables and outcomes. We used student's t-test to test the statistical difference of numerical variables among both groups if normally distributed. If not normally distributed, we used Mann-Whitney U test. P values less than 0.05 was considered statistically significant.

RESULTS

Three hundred and fifty patients with cleft palate had been enrolled in the study. One of them was excluded due to marked airway edema which necessitated patient's transferal to pediatric intensive care unit. He was intubated and sedated for the next hours post- operatively. There was no statistically significant difference between the two groups regarding their demographic data **(Table 1)**.

Table (1): Comparison between maxillary group and palatine group according to demographic data

Groups / Variables	Maxillary group (n=175) Median (Q1-Q3)	Palatine group (n=174) Median (Q1-Q3)	P value
Age (years)	2 (1-4)	2.38 (1 – 5)	0.29[M]
Weight (kg.)	8.4-12.8) (10.6	10.8 (8.6 – 14.2)	0.281[M]
Gender*			0.998[C]
Male	85 (48.5)	84 (48.2)	
Female	90 (51.7)	90 (51.7)	
* Data described in terms of frequency (percentage). [M] Mann Whitney-U test, [C] Chi-Square test			

Regarding the postoperative HR, it was less in palatine group patients than in maxillary group patients with statistical significant difference as shown in table 2, but no clinical difference was recorded **(Table 2)**.

Table (2): Comparison between maxillary group and palatine group according to heart rate levels post-operatively

Groups / HR (beat /min)	Maxillary group (n=175)	Palatine group (n=174)	P value
4 hr.	110.86 ± 8.4	108.65 ± 8.38	0.014
8 hr.	113.1 ± 8.56	110.8 ± 8.54	0.012
12 hr.	115.37 ± 8.74	113.04 ± 8.72	0.013
16 hr.	115.37 ± 8.77	113.04 ± 8.72	0.013
20 hr.	118.26 ± 8.99	115.87 ± 8.93	0.013
24 hr.	120.56 ± 9.16	118.13 ± 9.11	0.013

Data presented as mean ± SD.

We found that the mean arterial blood pressure increased gradually over the day in both groups from a median level of 61.73 mmHg 4 hours postoperatively to 65.49 mmHg 24 hours postoperatively in the maxillary group, and from 63.04 mmHg 4 hours postoperatively to 66.87 mmHg 24 hours postoperatively with in the palatine group. However, this was statistically insignificant **(Table 3)**.

Table (3): Comparison between maxillary group and palatine group according to mean arterial blood pressure levels post-operatively

Groups / MAP (mmHg)	Maxillary group (n=175)	Palatine group (n=174)	P value
4 hr.	61.73 (55.23 – 69.53)	63.04 (56.3 – 76.5)	0.136
8 hr.	61.44 (54.97–69.2)	62.73 (56.02 – 76.15)	0.133
12 hr.	62.83 (56.21 – 70.77)	64.15 (57.29 – 77.88)	0.134
16 hr.	62.83 (56.21 – 70.77)	64.15 (57.29 – 77.88)	0.145
20 hr.	64.71 (57.89 – 72.89)	66.07 (58.67 – 80.22)	0.145
24 hr.	65.49 (58.6 – 73.76)	66.87 (59.37 – 81.17)	0.148

Data presented as median and range.

There was a significant difference between both groups according to CHIPPS score for pain assessment at 6 and 8 hours postoperatively with a median IQR of 2 (1 – 2) vs 2 (2 – 4), 2 (2 – 3) vs 2 (1 – 2.75) respectively. On 1hr., 2hr., 4hr., 12hr., 18hr. and 24hr. There was no statistically significant difference **(Table 4)**.

Table (4): Comparison between maxillary group and palatine group according to CHIPPS scores

Groups / CHIPPS	Maxillary group (n=175)		Palatine group (n=174)		P value
	Range	Median (Q1-Q3)	Range	Median (Q1-Q3)	
1 hour	(0 – 2)	0 (1 – 1)	(0 – 2)	1 (0 – 1)	0.425
2 hours	(0 – 3)	1 (1 – 1)	(0 – 2)	1 (1 – 1)	0.913
4 hours	(1 – 3)	1 (1 – 1)	(1 – 4)	1 (1 – 2)	0.430
6 hours	(1 – 4)	2 (1 – 2)	(1 – 4)	2 (2 – 4)	<0.001
8 hours	(0 – 4)	2 (2 – 3)	(0 – 4)	2 (1 – 2.75)	<0.001
12 hours	(0 – 4)	2 (2 – 3)	(0 – 4)	2 (2 – 3)	0.17
18 hours	(0 – 4)	3 (2 – 3)	(0 – 4)	3 (2 – 3)	0.133
24 hours	(1 – 3)	2 (2 – 3)	(0 – 3)	2 (2 – 3)	0.463

Data presented as median and range.

Intraoperative fentanyl consumption was comparable between both groups **(Table 5)**. As regard post-operative analgesic consumption, maxillary group patients consumed nalbuphine with a median of 1.86 mg ± 0.73 which was similar to palatine group patients which consumed 1.97 ± 0.91 mg. this was statistically insignificant (P=0.65). i.e. There was clinical difference between both groups (analgesic consumption was more in palatine group) but with no statistical significance. However, there was statistical significant difference between both groups as regard nalbuphine consumers (P= 0.011). The time to first rescue analgesics was significantly higher in the maxillary group patients compared to the palatine group patients (P<0.001) **(Table 5)**.

Table (5): Comparison between maxillary group and palatine group according to intraoperative and post-operative analgesic consumption

Groups / Analgesics	Maxillary group (n=175)	Palatine group (n=174)	P value
Fentanyl consumers (%)	42 (24)	56 (32.2)	0.089
Fentanyl amount (mic.gm)	6 ± 2.26	5.73 ± 1.36	0.609
Nalbuphine consumers (%)	32 (18.3)	52 (29.9)	0.011
Nalbuphine amount(mg.)	1.86±0.73	1.97±0.91	0.65
Time to rescue analgesic (minutes)	480 (465 – 480)	330 (300 – 360)	<0.001

Data presented as median (range) and mean ±SD.

As regard the reported complications, hematoma formation after block was significantly higher in maxillary group patients while tubal disconnection and desaturation intraoperatively were significantly more in palatine group patients as shown in table 6. Other reported complications were not significantly different between both groups **(Table 6)**.

Table (6): Comparison between Maxillary group and palatine group according to the reported complications

Groups / Complications	Maxillary group (n=175)	Palatine group (n=174)	P value
Nausea	18 (10.3)	24 (13.6)	0.314
Vomiting	8 (4.6)	14 (8)	0.181
Hematoma	18 (10.3)	8 (4.5)	0.043
Sedation	2 (1.1)	4 (2.3)	0.448
Injury	0	0	1
Desaturation and reintubation	4 (2.3)	4 (2.3)	1
Difficult intubation	8 (4.6)	4 (2.3)	0.379
Hypothermia	4 (2.3)	8 (4.5)	0.258
Laryngeal spasm	6 (3.4)	5 (2.8)	0.767
Tubal disconnection and desaturation	0	6 (3.4)	0.015

Data presented as number and percentage.

DISCUSSION

Analgesia using a local nerve block is being increasingly used in generally anaesthetized young children and has demonstrated a good safety profile *(Johr, 2015)*.

In contrast to opioids, local anesthetics can be used safely and, according to recent guidelines, regional anesthesia is now accepted as the cornerstone of postoperative analgesia in pediatric patients *(Richard et al., 2012)*.

As far as we are aware, this is the first prospective, randomised, double-blind study comparing the bilateral suprazygomatic maxillary nerve blocks with the traditional palatine nerves blocks during cleft palate surgery in pediatric population at Al Azhar University Hospitals. Our results showed that palatine block received patients who received post-operative analgesics were more in number and consumption of rescue analgesia but with no statistically significance difference.

Mesnil et al. (2010) found that use of maxillary nerve block by the suprazygomatic approach in children undergoing cleft palate surgery decreased peri-operative consumption of opioids, which is consistent with the results of our study.

Sola et al. (2012) studied the effectiveness and sonographic features of SMB in CP repair in children. In their study, 64% of patients received a bolus of nalbuphine in the first 48 hr. and 20% required a nalbuphine infusion, which is consistent with the results of our study.

Chiono et al. (2014) compared SMB with either 0.15 ml/kg of 0.2% ropivacaine or 0.15 ml/kg of isotonic

saline on each side. The overall dose of intravenous morphine after 48 hr. was lower in the ropivacaine group compared with that received block with isotonic saline, they showed a 50% reduction of morphine consumption and a significant reduction in the number of patients requiring morphine infusion (3.6 vs. 31%).This is consistent with the results of our study.

Abu Elyazed and Shaimaa (2018) Study demonstrated that SMB provided better postoperative analgesia and decreased rescue analgesic consumption as well as time to tolerate oral feeding compared to PB without increased side effects. This is consistent with the results of our study.

Mustafa et al. (2018) reported that bilateral SMB is an effective, easy, and safe method for pain relief in children undergoing primary cleft palate repair surgeries, which is consistent with the results of our study.

Selim (2016) demonstrated that bilateral GPN block in pediatric patients undergoing palatoplasty provided better analgesia as compared to bilateral SMB, which is in contrast to our results. The difference of these results as compared to our findings may be explained by the fact that Selim included only 40 patients in his study versus 350 patients in our study. In addition another difference is age group (6 months-5years) while in our study age group was from one year to five years.

Gaston et al. (2019) reported lower percentage of patients received intraoperative fentanyl; 20% and 28.6% compared to 24% and 32.2% in our study for maxillary and palatine groups respectively. Also they reported higher nalbuphine consumers postoperatively in patients received SMB than in patients received palatal blocks; 35% and 21.4% respectively, which is in contrast to our results. The difference of these results as compared to our findings may be explained by large sample size (350 patients) in our study as compared to Gaston et al. (34 patients for CP repair), study also included children and adults with the fact that they are different populations, and mandate the use of different postoperative pain scales. Moreover, they used multimodal analgesia intraoperative in the form of paracetamol and dexamethasone. Finally, increased nalbuphine consumers in Gaston et al. study in patients received SMB was limited to post anesthesia care unit, this can be explained by difficulty to differentiate pain and anxiety in young children in the first postoperative hours and occurrence of emergence delirium after sevoflurane anesthesia may have led to unwarranted administration nalbuphine which has a sedative effect.

As regard the time to first rescue analgesia in our study, it was more in the maxillary block received patients (480 (465 – 480) min.) compared to the palatine block received patients (330 (300 – 360) min.) with P value<0.001. Pain score was comparable allover times of measurements except at 6 and 8 hours postoperatively; more pain relief in maxillary block received patients.

Muthukumar et al. (2012) investigated local infiltration of lidocaine in cleft lip and/or palate repair. They reported better pain scores only in the first two hours postoperatively, while saving of rescue analgesia was only in the immediate

postoperative period. This may reflect rapid systemic absorption of local anesthetics injected in the palatal mucosa. This is differs from our study as we used bupivacaine injection in the block which has longer duration of action and less absorption than lidocaine.

Gaston et al. (2019) reported pain scores less than or equal to 3 during the first 24 h in both groups and there were no statistically significant differences between them. After 20 h post-surgery, more than 25% of the patients experienced pain more than 3 in both groups (29.1% in the maxillary group vs. 27.1% in the palatine group. The difference of these results as compared to our findings may be explained by multimodal analgesia given intraoperatively in the form of paracetamol and dexamethasone. They also locally infiltrated the surgical area with 1% lignocaine with adrenaline 1:200000.

Abu Elyazed and Shaimaa (2018) Study demonstrated that time to rescue analgesic given was 482.50 ± 38.62 minutes and 260.00 ± 31.62 minutes in maxillary and palatine groups respectively, which is consistent with the results of our study.

CONCLUSION

Bilateral suprazygomatic maxillary nerve blocks using 0.25% bupivacaine 0.15 ml/kg provided post-operative long duration of analgesia and superior pain relief with comparable total analgesic consumption compared to palatal nerves block using 0.25% bupivacaine in children scheduled for cleft palate surgery.

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دراسة مقارنة بين الإحصار ثنائى الجانب للعصب الفكى العلوى أعلى القوس الوجنى وإحصار أعصاب الحنك فى الأطفال الذين يخضعون لجراحة إصلاح شق الحنك

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خلفيـــة البحـــث: يُعـــد الحنـــك المشـــقوق أحـــد أكثـــر التشـــوهات الوجهيـــة القحفيـــة الموجـــودة فـــى الأطفـــال ،والـــذى يتطلـــب إصـــلاح جراحـــى فـــى وقـــت مبكـــر مـــن ســـن الطفـــل حتـــى يتســـنى لـــه التغذيـــة والنطـــق بشـــكل صـــحيح ولتقليـــل المضـــاعفات الناتجـــة عـــن هـــذا العيـــب مثـــل إلتهـــاب الجيـــوب الأنفيـــة ومجـــرى التـــنفس المتكررين.ويعتبـــر هـــذا الإصـــلاح الجراحـــى مـــؤلم للطفـــل؛ الأمـــر الـــذى يســـتدعى اســـتخدام عقـــاقير مســـكنة أثنـــاء وبعـــد الجراحة.

وتـــوفر المـــواد الأفيونيـــة حـــلاً لتقليـــل الألـــم أو تلافيـــه فـــى فتـــرة مـــاحول العمليـــة الجراحيـــة، ولكـــن لهـــا آثارهـــا الجانبيـــة خاصـــة فـــى هـــذا النـــوع مـــن العمليـــات بحيـــث أنهـــا تـــؤثر علـــى تحكـــم الطفـــل فـــى مجـــرى التـــنفس ممـــا قـــد يـــؤدى لانســـداده، كمـــا أن لهـــا تـــأثيراً ســـلبياً علـــى معـــدل التـــنفس. لـــذلك، فـــإن اســـتخدام التخـــدير الموضـــعى لتســـكين الألـــم يعـــد بمثابـــة بـــديل لتقليـــل اســـتخدام هـــذه العقـــاقير ومضـــاعفاتها. ولقـــد تـــم الاعتـــراف بالفعـــل مـــن خـــلال الأبحـــاث العلميـــة أن التخـــدير الموضـــعي للأعصـــاب المغذيـــة للحنـــك كمســـكن لتخفيف آلام العمليات الجراحية يمكن تطبيقه.

الهـــدف مـــن البحـــث: دراســـة فعاليـــة تســـكين الآلام عـــن طريـــق غلـــق العصـــب الفكـــى العلـــوى مقارنـــة بغلـــق أعصـــاب الحنـــك (العصـــب الحنكـــى الكبيـــر، العصـــب الحنكـــى الصغير، والعصب الأنفى الحنكى) وأثرها فى استهلاك المسكنات الأفيونية.

المرضـــى وطـــرق البحـــث: تـــم إختيارثلاثمائـــة وخمســـين مـــن الأطفـــال المقـــرر لهـــم الإجـــراء الاختيـــاري لإصـــلاح شـــق الحنـــك بمستشـــفيات جامعـــة الأزهـــر فـــى الفتـــرة مـــن

مـــارس2019 وحتـــى مـــايو 2021. وتـــم توزيـــع المرضـــى عشـــوائياً إلـــى مجمـــوعتين متساويتين:

المجموعـــة الأولـــى: تلقـــى أفـــراد هـــذه المجموعـــة إحصـــارثنائى الجانـــب للعصـــب الفكـــى العلـــوى أعلـــى القـــوس الـــوجنى باســـتخدام عقـــار البيوبيفـــاكين بتركيـــز 0.25% بجرعـــة 0.15مل/كجم بحد أقصى 3مجم/كجم بجانب التخدير العام.

المجموعـــة الثانيـــة: تلقـــى أفـــراد هـــذه المجموعـــة إحصـــار ثنـــائى الجانـــب لأعصـــاب الحنـــك (العصـــب الحنكـــى الكبيـــر، العصـــب الحنكـــى الصـــغير، العصـــب الأنفـــى الحنكـــى) باستخدام عقار البيوبيفاكين بتركيز 0.25% بجانب التخدير العام.

النتـــائج: كـــان هنـــاك فـــرق بـــين المجمـــوعتين، وكـــان اســـتهلاك المســـكنات أكثـــر فـــي المجموعـــة الثانيـــة ولكـــن بـــدون دلالـــة إحصـــائية. ومـــع ذلـــك، فـــإن عـــدد المرضـــى الـــذين تلقـــوا المســـكنات الإنقاذيـــة كـــان أكثـــر فـــى هـــذه المجموعـــة مصـــحوبا بدلالـــة إحصـــائية. كـــذلك كـــان وقـــت اســـتخدام المســـكنات الإنقاذيـــة أكبـــر فـــي مرضـــى المجموعـــة الأولـــى مع وجود دلالة إحصائية واضحة.

الاســـتنتاج: الإحصـــارثنائى الجانـــب للعصـــب الفكـــى العلـــوى أعلـــى القـــوس الـــوجنى يـــوفر تســـكينًا فائقًـــا بعـــد الجراحـــة وخفـــض إســـتهلاك المســـكن الإنقـــاذي مقارنـــةً بالإحصـــار ثنـــائى الجانـــب لأعصـــاب الحنـــك (العصـــب الحنكـــى الكبيـــر، العصـــب الحنكى الصغير، العصب الأنفى الحنكى).

الكلمـــات الدّالـــة: إحصـــار العصـــب الفكـــي العلـــوي، الأطفـــال، الحنـــك المشـــقوق، العصـــب الحنكي، بيوبيفاكين.