A COMPARATIVE STUDY OF EFFECTIVENESS BETWEEN CAUDAL BUPIVACAINE AND CAUDAL BUPIVACAINE WITH RECTAL PARACETAMOL SUPPOSITORY IN PAEDIATRIC PATIENTS UNDERGOING SUB-UMBILICAL SURGERIES

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ABSTRACTS

BACKGROUND- We want to compare the effectiveness of caudal bupivacaine and caudal bupivacaine with rectal paracetamol suppository in paediatric patients undergoing subumbilical surgeries.

METHODS-It was a prospective randomized study done for for those pediatric patients undergoing sub umbilical surgeries, aged from 3 to 8 years weighing less than 20 Kg of either gender, ASA-1, in Department of Anaesthesiology, SVMC & SVRRGH, Tirupati,1year duration from the time of scientific and IEC approval

RESULTS- In both the caudal bupivacaine with rectal paracetamol group and the caudal bupivacaine group, the distribution of all cases in each weight group is comparable, and in all weight groups, there is a significant increase in rescue analgesic time in the caudal bupivacaine with rectal paracetamol group. The time needed to administer Rescue analgesic is increased by 4 hours 41 minutes in the 10-12 kg Group C patient, by 4 hours 51 minutes in the 13-15 kg Group C patient, by 4 hours 44 minutes in the 16-18 kg Group C patient, and by 4 hours 48 minutes in the 19-20 kg Group C patient. The time needed to administer Rescue analgesic is increased by 5 hours 54 minutes in the 10-12 kg Group C, by 5 hours 23 minutes in the 13-15 kg Group C, by 5 hours 31 minutes in the 16-18 kg Group S, and by 6 hours 03 minutes in the 19-20 kb Group S. When comparing the study group and the control group in terms of the mean R.A. Time, there is a highly significant difference between the two groups (t = 3.435, p 0.0001). Heart rates in Group S and Group C difference is significant. Because Group S has a significantly lower heart rate than Group C at all post operative time intervals, this indicates that Group S received a higher level of post operative analgesia. The pain score is considerably lower in the study group S (caudal bupivacaine with rectal paracetamol) than it is in the control group C [caudal bupivacaine alone] at all post operative intervals. When compared with Group S, the incidence of post-operative nausea and vomiting, as well as an increase in temperature, is significantly higher in Group C. The first postoperative urine voiding time in the study group is 5.410.51 hours, while the time in the control group is 4.380.34 hours. This difference is statistically significant (t = 3.434, p 0.05).

CONCLUSION -I conclude, based on the findings of the aforementioned study, that the addition of a paracetamol suppository to caudal bupivacaine improves the quality of post-operative analgesia and extends the duration of post-operative analgesia better than caudal bupivacaine alone does in paediatric patients undergoing subumbilical surgeries, thereby satisfying the criteria that were mentioned in the aim of the study.

KEYWORDS-FLACC SCALE, CAUDAL, SUBUMBILCAL SURGERIES, POSTOPERATIVE PAIN

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INTRODUCTION- Postoperative pain in children and adolescents is seldom taken seriously, despite the fact that it can occasionally lead to morbidity and mortality[1,2,9]. The utilization of pain scales allows for the proper management of paediatric patients [FLACC]. There are several routes that are involved in postoperative pain. It is necessary to use a multimodal analgesia protocol, which includes both opioid and non-opioid analgesics with enhancing the analgesic effect and lowering the risks connected with polypharmacy and the adverse effects[3]. If the tissue in the peripheral is damaged, this could lead to sensitization in both the periphery and the central nervous system[4,5]**.** This state is characterized by heightened sensitivity to pain despite the absence of an actual injury. In paediatric people treated for lower abdominal, inguinal, or penoscrotal surgeries, the caudal surgical treatment is a common localized medication for pain control during and after surgery[6]**.** This treatment can also be used intraoperatively. In addition to being simple to implement technically, risk-free, and dependable, and provides adequate pain relief for sub-umbilical procedures. On the other hand, the onset of action of caudal bupivacaine can persist anywhere from four to twelve hours. The period of post-operative analgesia can be extended with the help of a number of different additives **7.** However, the analgesia that it generates is excellent. In addition to bupivacaine, other combinations, such as ketamine, clonidine, tramadol, and midazolam were utilized. These drugs carry a risk that could lead to hypotension, behavioral disorders, vomiting, and sedation in order [8]. An efficient pain reliever is known as paracetamol. It is risk-free and easy to administer to children, particularly when it is in the form of a suppository, and it has a broad therapeutic spectrum. The use of rectal paracetamol does not cause the side effects that are associated with the use of nonsteroidal anti-inflammatory drugs (NSAIDs). These side effects include coagulopathy, nephritis, gastropathy, and bronchial asthma[10,11]. Excellent postoperative analgesia is produced as a result of paracetamol's centrally acting effect on the nociceptive process, which includes the process of central sensitization [12]. The goal of this study was to investigate the post-operative pain-relieving efforts that rectal paracetamol along with caudal bupivacaine who had been treated for sub-umbilical surgeries in children.

AIM AND OBJECTIVES OF THE STUDY

AIM: To assess the efficacy and extent of postoperative analgesia of paracetamol rectal suppository with caudal bupivacaine, in paediatric subjects undergoing surgeries in comparison with caudal bupivacaine alone.

OBJECTIVES

-Primary Objectives:

ϖ To compare Postoperative pain severity using the FLACC scale.

ϖ To compare the extent of postoperative analgesia among groups.-

-Secondary Objectives:

ϖ Compare vital parameters in both groups postoperatively.

METHODS AND MATERIALS

Study Design: A prospective randomized study.

Study Period: 1 year duration from the time of scientific and IEC approval.

Study Subjects: This study comprised of pediatric patients undergoing sub-umbilical surgeries, aged from 3 to 8 years weighing less than 20 Kg of either gender, ASA-1.

Study Setting: Department of Anaesthesiology, SVRRGH, Tirupati.

Study Sample- Sample: 60

Inclusion criteria: • Patients undergoing sub-umbilical surgeries. • Age 3- 8 years. • Weight < 20 KGs. • Children in ASA-1 category. • Parent or Guardian willing to give consent.

Exclusion criteria: • Children with h/o allergy to local anaesthetics. • Undiagnosed diarrhoea. • Local sepsis (Caudal)

METHODOLOGY -Randomization was used to divide sixty children, all of whom belonged to the ASA I category and were scheduled to have sub-umbilical surgeries, into two groups. Caudal bupivacaine, also known as Group C, and Group S (Caudal bupivacaine with paracetamol suppository). Patients will be randomly allotted to two groups by computer-generated random table and sealed opaque envelope technique. The subject is given a sealed envelope which contains the group allocation and opened only after valid consent is obtained, then the patient is allotted to that group. Thus randomization sequence will be generated before initiating the study. Sixty patients will be recruited during the study period..

Premedication: Inj. Glycopyrrolate 0.04mg/kg I.V8. Inj. Ondansetron 0.1mg/kg I.V.

Monitoring; Parameters Monitored are Pre induction HR, SpO2, RR, ECG, BP, and Surface Temperature. Post induction HR, SpO2, RR, ECG, BP, and Surface Temperature. Intraoperatively continuous monitoring of HR, RR, ECG, SpO2, BP, and Surface Temperature was done and recorded every 5 mins till the surgery is completed. Postoperatively assessment of pain was done using the FLACC pain scale. Postoperative nausea and vomiting.

PROCEDURE: Obtain consent for the procedure from the parents. After induction of short general anaesthesia and airway control, the patient is positioned laterally (or ventrally), with their hips flexed to 90°. Skin disinfection should be performed carefully, because of the proximity to the anus. An aseptic technique should be maintained. Thorough preparation of the

skin is necessary, as is the use of sterile gloves. It is possible to detect the sacral hiatus by first palpating the coccyx and then sliding the palpating finger in a cephalad direction (towards the head) until a depression in the skin is felt. Confirmation of bony landmarks is essential to achieve success in this location because there is the potential for a high degree of anatomical variance in this area. After the sacral hiatus has been located,. Next, a 22-gauge short beveled cannula or needle is positioned at about 45 degrees to the skin and inserted until a "click" is felt as the Sacro-coccygeal ligament is pierced. After this, the needle is guided with extreme care in a cephalic direction at an angle that is becoming closer to the longitudinal axis of the spinal canal. The highest dose of 0.25% Bupivacaine that is suggested is 2 milligrams per kilogram. Under aseptic conditions, each of the sixty children got a caudal epidural injection of 0.25% bupivacaine at a rate of 1 ml per kilogram while lying on their left side. Following a caudal epidural, each of the thirty children who fell into the Group S category was given lignocaine gelly and a dose of rectal paracetamol ranging from 15-20 mg/kg. Thirty children in Group C were solely given caudal epidural anaesthesia as their only kind of anaesthesia. Postoperatively, immediately after surgery, patients were transported to the recovery room& all postoperative parameters were monitored in the recovery room at regular intervals of 15 minutes for the first two hours and 30 minutes for the following three hours. After an initial two hours after the operation, children were started on oral feedings.

STATISTICAL ANALYSIS -In total, sixty children who had previously undergone sub-umbilical surgery volunteered to take part in the study. Between Group S (caudal bupivacaine with rectal paracetamol) and Group C [caudal bupivacaine alone], they were evaluated for the pain score using the FLACC scale rescue analgesic time, the modified Aldrete recovery score, rise in temperature, postoperative nausea and vomiting, and first post-operative urine voiding time were compared. The duration of the Mean Rescue Analgesic time in Group S was compared to the duration of the same time in Group C. When compared to the control group, study group S demonstrates a statistically significant improvement in both the post-operative analgesia time and quality, as well as a decrease in the overall pain score. This is the case despite the fact that study group S received the same amount of analgesia as the control group. In control group C, there was a significantly higher incidence of postoperative nausea and vomiting, as well as a significantly higher incidence of fever. The vast majority of the children had urinated anywhere between six and seven hours after they had last eaten. Because none of the children had any issues with being able to contain their urine, catheterization was not necessary in any of the cases. The variables of age, weight, Pain scores, rescue analgesic time, heart rate, respiration rate, the modified Aldrete recovery score, and urine voiding time were analyzed using Levene's test for equality of variances and the t-test for equality of means. The Chi-square test was utilized in order to investigate the gender distribution of the sample, in addition to the frequency of experiencing postoperative nausea and vomiting. This was done so that we could better tailor our treatment options.

RESULTS:

TABLE 1: COMPARISON OF MEAN AGE DISTRIBUTION BETWEEN GROUPS

Mean Age	Group C	Group S	t Value	P Value
	5.1 ± 1.8 Yrs	5.3 ± 2.4 Yrs	0.345	0.124

TABLE 2 : COMPARISON OF SEX DISTRIBUTION BETWEEN GROUPS

SEX	Study	Control
Male	100.00%	100.00%
Female	0.00%	0.00%

TABLE 3: WEIGHT DISTRIBUTION WISE TIME FOR RESCUE ANALGESIA

	10-12 KG		13-15 KG		16-18 KG		19-20 KG	
	Group C	Group S	Group C	Group S	Group C	Group S	Group C	Group S
No.of Cases	8	7	9	8	7	8	6	6
Mean Rescue Analgesia Time (hrs)	4.41	5.54	4.51	5.23	4.44	5.31	4.48	6.03

TABLE 4 : COMPARISON OF TIME FOR RESCUE ANALGESIA BETWEEN GROUPS

Time (In Minutes)	Mean ± Sd (Max, Min)	t value	p value
STUDY	341± 5.31 (300, 420)	3.435	0.0345
CONTROL	253 ± 3.9 (240, 300)		

TABLE 5: COMPARISON OF HEART RATE DISTRIBUTION DURING DIFFERENT TIME INTERVALS BETWEEN GROUPS

Time in Mins	Group S	Group C	P Value
150	113.4	122.2	0.034
180	112.6	123.4	0.022
210	110.3	120.3	0.000
240	107.3	118.5	0.000
270	104.3	118.6	0.000
300	104.6	117.4	0.000
330	103.9	117.5	0.000
360	103.6	117.1	0.000
390	104.2	116.9	0.000
420	103.7	115.4	0.000

TABLE 6: COMPARISON OF RESPIRATORY RATE DISTRIBUTION DURING DIFFERENT TIME INTERVALS BETWEEN GROUPS

Time in Mins	Group S	Group C	P Value
150	15.7	20.1	0.001
180	15.8	19.9	0.011
210	15.6	19.7	0.012
240	15.4	19.0	0.022
270	15.6	18.9	0.014
300	15.4	18.8	0.011
330	15.3	18.3	0.002
360	15.3	18.1	0.000
390	15.2	18.0	0.000
420	15.9	17.5	0.032

TABLE 7: COMPARISON OF ALDRETE DISTRIBUTION DURING DIFFERENT TIME INTERVALS BETWEEN GROUPS

Time in Mins	Group S	Group C	P Value
150	6.0	6.3	0.035
180	6.5	7.1	0.023
210	6.9	7.2	0.035
240	7.3	8.0	0.023
270	7.4	8.3	0.000
300	7.8	8.4	0.001
330	7.9	9.0	0.000
360	8.1	9.3	0.000
390	8.4	9.7	0.001
420	9.0	9.7	0.001

TABLE 8 : COMPARISON OF FLACC DISTRIBUTION DURING DIFFERENT TIME INTERVALS BETWEEN GROUPS

Time in Mins	Group S	Group C	P Value
150	4.3	5.6	0.001
180	4.5	5.8	0.000
210	4.7	5.9	0.000
240	4.7	5.3	0.023
270	4.6	5.6	0.034
300	4.4	5.9	0.001
330	5.3	6.2	0.037
360	5.2	6.3	0.000
390	5.5	6.4	0.000
420	5.2	6.1	0.019

TABLE 9: COMPARISON OF INCIDENCE OF POSTOPERATIVE COMPLICATIONS BETWEEN GROUPS

Group	PONV	Rise in Temperatur	First Urine Voiding Time	Significance For First Urine Voiding Time P Value
GROUP C	14	5	4.38hrs	0.0001
GROUP S	2	1	5.41hrs	

Group	PONV	Rise in Temperature	First Urine Voiding Time	Significance For First Urine Voiding Time P Value
GROUP C	14	5	4.38hrs	0.0001
GROUP S	2	1	5.41hrs	

DISCUSSION - A total of sixty patients were chosen at random to be assigned to either the S group or the C group for each group only thirty. Those in Group C were given only caudal bupivacaine, whereas participants in Group S were given both caudal bupivacaine 0.25% 1ml /kg and a rectal paracetamol suppository 20 mg/kg. Group C participants received only caudal bupivacaine.

Rectal administration of paracetamol to a Group S patient requires more time period before the patient experiences a discernible rise in pain severity. Group C weighing 10-12 kgs, has a Rescue analgesic time extension of 4 hours, 41 minutes; Group D, weighing 13-15 kilograms, has a 4 hour, 51-minute extension; Groups 16-18 kg have a 4 hours, 44-minute extension; and Group D, weighing 19-20 kilogram, has a 4 hour, 48-minute extension. For patients weighing 10-12 kilograms, Group C receives an extra 5 hours and 54 minutes of Rescue analgesic time, while patients weighing 13- 15 kilograms receive an extra 5 hours and 23 minutes, patients weighing 16- 18 kilograms receive an extra 5 hours and 31 minutes and patients weighing 19-20 kilograms receive an extra 6 hours and 3 minutes. It has been found that both Group S and Group C had significantly different heart rates. The superior quality of postoperative analgesia in Group S is reflected in a considerably lower heart rate compared to Group C at all postoperative time intervals. Respiratory rates in Group S and Group C are different. There is a statistically significant difference between the respiratory rates of Group S and Group C across all postoperative time points, with a lower rate in Group S indicating better postoperative analgesia. Both postoperative nausea and vomiting and temperature increases are more common in Group C than in Groups. In 2008, Neeru Gupta and her coworkers[16] conducted a study in which they investigated the postoperative analgesic effects of caudal bupivacaine and rectal diclofenac in sixty children who had undergone sub-umbilical procedures. As a consequence of the procedures, the study participants compared the unpleasant levels of discomfort. In the first group, the caudal administration of bupivacaine was performed at a rate of 0.5 ml/kg at 0.25%. Rectal administration of diclofenac at a dose of one milligram per kilogram of body weight was performed on the participants in the group that was designated as Group II. In Group III, patients received rectal diclofenac at a dose of 1 mg/kg of their body weight in addition to caudal bupivacaine at a rate of 0.5 ml/kg of their body weight. Patients in this group also received caudal bupivacaine. In Group I, the post-operative analgesic duration was 8.2 hours 1. 3 hours on average, while in Group II, it was 8.3 hours 1. 3 hours on average.

When Group I was compared to Group II, this difference was observed in the data. In total, Group III took 13 hours and 2.3 minutes to complete the task, whereas Group II took 12 hours and 3.4 minutes.In our study paracetamol rectal suppository is used instead of diclofenac suppository. The research mentioned that rectal paracetamol was used instead of diclofenac showing postoperative analgesic time up to 5 hrs and 50 minutes which is usually less when compared to the above study. Using paediatric patients undergoing sub-umbilical surgeries, Raghavan et al.[18] (2012) compared the postoperative analgesic efficacy of a paracetamol rectal suppository to that of caudal bupivacaine and caudal bupivacaine. Sixty children undergoing a variety of surgical procedures took part in the study.

The study found that the rectal paracetamol group S had a considerably longer post-operative analgesic duration than the caudal bupivacaine alone group C, as measured by Mean Rescue Analgesic Time. This conclusion was reached because the rectal paracetamol group S experienced a considerably longer duration of analgesia following surgery. Rectal paracetamol group S had significantly longer postoperative analgesic duration, lending credence to the study's main finding. This research is very comparable to ours and displays similar findings. With a P value less than 0.0001 and a t value more than or equal to 13.9, analgesia was experienced by both Group S (353 minutes less than 6.0) and Group C (253 minutes less than 3.9). Paracetamol's analgesic effect may be mediated by molecular targets other than COX, as suggested by research by Bertolini A., Ferri.A. et al[13]

The findings of this inquiry, which was conducted by L. Analysis and comparison were done by Sundararajan and colleagues about the analgesic efficacy of levobupivacaine and racemic bupivacaine, as well as the degree of residual motor weakness following a caudal block in paediatric sub umbilical surgeries (2018. In a study that was carried out by Steve Golladay, Suehutter[15], and other researchers, 32 children who were going to have a peritonioscopy were either given the subject drug. The purpose of the study was to determine which method was more effective in reducing pain during the procedure. Comparing the two approaches was the reason for conducting the study in the first place. The findings of the investigation revealed that fifty-four percent of the children who were given paracetamol by rectal administration did not require any additional analgesia in the first twenty-four hours following the operation.. Based on the evidence presented here, it would appear that using paracetamol on its own as a post-operative analgesic s an efficient way to alleviate pain.In our study, 20mg/kg rectal paracetamol suppository additional to caudal bupivacaine was given to patients instead of 30mg/kg used in their study to provide postoperative analgesia. In our study we use rectal paracetamol suppository along with caudal bupivacaine for comparison with bupivacaine alone, in their study they compare caudal bupivacaine injection with rectal paracetamol suppository separately. However, the results show patients who received rectal paracetamol suppository had good postoperative analgesia in both studies. As part of their investigation, Shreshta and colleagues (2010)[17] conducted a study to determine the analgesic efficacy of caudal bupivacaine[Group A] received 0.5ml/kg of 0.25% bupivacaine compared with a mixture of caudal bupivacaine 0.5ml/kg of 0.25% bupivacaine and tramadol with 1ml/kg [Group B] for postoperative analgesia. According to the findings of the study, the amount of time that patients in Group B reported feeling relief from their pain was significantly longer in the median value than it was for patients in Group A. This difference was significant when compared to the amount of time that patients in Group A reported feeling relief from their pain. Patients who were part of Group A said that the amount of time it took for them to have pain

relief was noticeably shorter. (8.8 Hours Compared to 7 Hours). In comparison, only 20% of patients in group A experienced symptoms such as nausea and vomiting, whilst 25% of patients in group B reported having similar experiences. Patients in group A reported having a lower frequency of experiencing these symptoms, while individuals in group B reported having a higher frequency of experiencing these symptoms. Throughout the course of our investigation, we came to the conclusion that Group C had a total of 14 occurrences of PONV, whereas Group S had a total of only two such cases.In our study In addition five patients in Group C experienced an increase in temperature whereas the total number of patients in Group S who encountered this consequence was just one. The evidence that was provided made it abundantly clear that the performance of Group S was noticeably superior to that of Group C in every way that could possibly be compared between the two groups. In our study we use paracetamol rectal suppository for analgesia combined with caudal bupivacaine whereas in their study tramadol is given in combination with caudal bupivacaine for post-operative analgesia in this way it is different from our study. The analgesic effects of caudal bupivacaine alone[Group B] 1ml/kg 0.25% as well as the combination of caudal bupivacaine1ml/kg of 0.25% and clonidine 1microgram /kg[Group BC] were evaluated in a study that was carried out by Rajan R. in 2017[19] and eventually published by him. This study was conducted in collaboration with one's coworkers. Participants in the study ranged in age from 2 years old up to 8 years old, and all of them gave their informed consent to have elective procedures performed on various regions of their lower abdomen. In order to provide a comparison between the respective incidence rates of adverse effects experienced by the two groups of participants, the researchers were interested in determining the length of analgesia that was provided by each treatment. The two different groups of participants are going to be compared head-to-head in this way. When it comes to children, ineffective pain management can lead to morbidity both in the short term and in the long term. As a result of this, it is of the utmost importance to administer postoperative analgesia at the same time that any kind of anaesthetic is being administered. This is because it will reduce the amount of pain that the patient experiences after surgery. When both bupivacaine and clonidine were injected caudally at the same time, the analgesia was significantly increased, and the patient required less analgesic medication for a longer period of time than when bupivacaine was given on its own. This impact persisted for a period of time that was appreciably longer than when bupivacaine was administered on its own. When combined, the adverse effects of bupivacaine and clonidine were much more severe, despite the fact that each of these substances, on their own, had very mild side effects. The fact that each of these effects, when viewed separately, could have been categorised as being quite mild. Throughout the course of our research, we came to the conclusion that the quality of post-operative analgesia, in addition to its length, was enhanced when rectal paracetamol was combined with caudal bupivacaine, as was the case with Group S. This was the situation in all of the other groups, as well. This was the circumstance in which we discovered ourselves to be That the caudal bupivacaine is delivered in order to offer immediate post-operative pain relief, while the rectal paracetamol is administered in order to offer pain relief during the latter stages of the recovery process. Both of these pain relievers are intended to be used in conjunction with one another. These two drugs are combined and given to the patient in order to provide them with pain relief. It is well knowledge that there are no known dangers associated with the administration of paracetamol to young patients; this finding is consistent with data from earlier studies. Therapeutic levels of 10 mcg/dl are acquired after one to two hours of rectal administration of the suppository, and the rectal bioavailability ranges anywhere from 75% to

99% of the time. These results are obtained within one to two hours. Everything takes place within a span of one to two hours at the most. The risk of experiencing liver cell death is significantly reduced when the drug is taken in accordance with the instructions provided by the doctor (that is, at the recommended dosage) (1;5,00,000). If you have ever had an allergic reaction to paracetamol in the past, you should avoid taking it under any circumstances. However, it is important to note that this kind of reaction is quite rare. Dmytriiev DV and colleagues (2020)[23] conducted an investigation into the efficiency of a caudal block Group C with 1 ml/kg of 0.2% bupivacaine compared with ultrasound-guided quadratus lumborum block Group Q with 0.5 ml/kg of 0.25% bupivacaine in elective appendicitis cases and determined whether or not the patient required rescue analgesia while they were undergoing surgery as well as after the procedure. As a last-ditch effort to alleviate the patient's pain, an emergency dose of acetaminophen at a rate of 20 milligrams per kilogram was administered to them. Postoperative analgesia was evaluated using the CHIPPS score.in our study, we use the FLACC scale to access postoperative analgesia. According to the findings of Gandhi M. and colleagues (2021)[24], the combination of 0.1 mg/kg of dexamethasone with 0.25% bupivacaine for caudal block and administration of the mixture as a 1 ml/kg mixture in children 63 undergoing infra-umbilical surgeries resulted in a prolonged duration of analgesia (time to first rescue analgesia) with hemodynamic stability, as well as a significant reduction in total opioid requirement. In our study, we used the paracetamol suppository along with caudal bupivacaine instead of dexamethasone used in their study. The length of postoperative analgesia was better in group caudal bupivacaine with diclofenac combination than individually in accordance with the findings of the research that was carried out by Neeru Gupta and Anjali Mehtha et al[16], they compare the rectal diclofenac 1mg/kg alone Group 1 with caudal bupivacaine0.5ml/kg Group 2 and caudal bupivacaine 0.5ml/kg in addition with rectal diclofenac1 mg/kg. It was determined that this was indeed the case. On the other hand, AR Wolf, Hughes D, and Wade A et al[28] discovered that the post-surgical analgesia only remained effective for a total of seven hours after it had been delivered.In their study used morphine i.v for sedation and analgesia along with caudal bupivacaine. According to the findings of the investigation that we carried out, patients in group C who were given caudal bupivacaine experienced postoperative analgesia for a period of time that lasted for as long as 4 hours and 13 minutes. This result was lower than the one that was obtained in the previous experiment; this could be the result of differences in the method by which the pain score was evaluated, and the quantity and volume of bupivacaine that was administered during surgery.

The researchers Zewdu D. and colleagues (2020)[22] came to the conclusion that the intensity of the pain was determined by three factors. These factors were the FLACC/NRS score, the amount of time that had passed since the patient had requested pain medication and the total quantity of analgesics that had been consumed. They compared 3 groups caudal block with rectal diclofenac [CD], caudal block with rectal paracetamol [CP], and caudal block alone [CA]. The FLACC/NRS score that was reported by the CD group was significantly lower when compared to the score that was reported by the CA and CP groups. Additionally, it took the CD group a significantly longer length of time to request the first painkiller than it did for the CA and CP groups. On the FLACC pain scale, the group that received rectal paracetamol at all post-operative intervals had a lower score than the group that received caudal bupivacaine. The table that follows offers not only the average score on the FLACC but also the standard deviation that corresponds with it. In our study when compared to the group that served as the control, the group that was given rectal paracetamol experienced an increase in Rescue

analgesic time of 1 hour 17 minutes. On the other hand, the group that received rectal paracetamol and weighed 13-15 kg experienced an increase in Rescue analgesic time of 1 hour 20 minutes. In comparison to Control Group C, the duration of the analgesic effect of Rescue was increased by 1 hour and 49 minutes in the 16-18 kg group. In contrast, the 18-20 kg group experiences a delay in the Rectal paracetamol Group S that continues for a total of 2 hours and 4 minutes. According to the findings of the research that we conducted, older children who weighed 16–20 kg received a higher level of postoperative analgesia in rectal paracetamol Group S 35–45 minutes compared to younger children who weighed 10-15 kg and were in the same group. This was the conclusion drawn from the findings of the study that we carried out. According to Goddard, pickup SE et al[25]., this phenomenon can be explained by the fact that older children have a higher pain tolerance than younger children, as well as by the fact that the comfort given by parents is more effective. Specifically, older children have a higher pain tolerance than younger children in their study. Fentanyl was utilized as an adjuvant in the current study; however, it did not provide any advantages over levobupivacaine on its own in terms of the length of time that pain was eased. This information was discovered by Vakkapatti M. and the other researchers working with him (2019)[20]. According to the findings of our study, the Average First Rescue Analgesic Time was substantially longer in both groups of children who had circumcisions compared to those who had herniotomies. This was the case for both groups of children who underwent herniotomies. If you are in Group S, you have until the time restriction of 20 minutes to finish the work, but if you are in Group C, you only have until the time restriction of 18 minutes. This is mostly owing to the fact that in our study, we are utilizing 1 ml/kg of 0.25% bupivacaine for caudal analgesia, despite the fact that Armitage specifies that merely 0.5 ml is necessary for a block up to L1-L2 when circumcising. This is the primary reason why this is the case. The fundamental reason for this is due to the fact that this is the case. This is the most important component that led to the observed differences in the results. Following the completion of an examination of the gap in mean HR that existed between the two groups, Chhaule S et al. (2020)[21] compared two dosages of clonidine (1 [micro]g/Kg and 0.5 [micro]g/Kg) given to caudal bupivacaine (0.125%) 0.75 mL/Kg to the two groups of children undergoing infraumbilical operations under inhalational anaesthesia were compared for effectiveness and side effects came to the following conclusion as a result of their findings. Bupivacaine had a greater post-operative analgesic effect than 0.5 [micro]g/Kg of clonidine, and 1 [micro]g/Kg of clonidine may be the least clinically significant and effective additive dosage for prolonging caudal epidural analgesia. Bupivacaine had a greater post-operative analgesic effect than 0.5 [micro]g/Kg of clonidine.The study conducted by Shahidkhan and Mohammed Iqbal et al in 2006[27] about the post-operative analgesic effect of caudal bupivacaine with tramadol patients receiving caudal bupivacaine with tramadol has good postoperative analgesia compared with only caudal bupivacaine.

In the study, we discovered that the heart rates of individuals who were a part of the control group (group C) were 10–11% higher than those of individuals who were a part of the group that received rectal paracetamol (group S) at each and every post-operative time interval. This was the finding that we came to after finding that the heart rates of individuals who were a part of the group that received rectal paracetamol were 10–11% lower than those of individuals who were Our investigation led us to this conclusion. According to the findings of a study that was carried out by Maunikela Eeva[26] and her colleagues, there was an increase of 20% in the frequency of one's heartbeat. In the study that was carried out by Jan Muhammad Shaik and Sikander ali Mughal et al.[14], in which 143 patients were given solely caudal bupivacaine, the

incidence of postoperative nausea and vomiting was discovered to be 33% in Group C caudal bupivacaine alone, in our study we found that Group C had a significantly lower incidence of postoperative nausea and vomiting than the other groups did. The people who took part in the study who were assigned to Group C had a one in sixteen and a half percent chance of experiencing an increase in temperature, whereas none of the people who were assigned to Group S experienced a rise in temperature. Due to the fact that Group C had a P value that was higher than 0.05, it can be deduced that the amount of time that passes between the first and second times a person empties their bladder is significantly longer in Group S (5 hours 41 minutes) than it is in Group C. This is because a P value that is less than 0.05 indicates that the difference between the two groups is significant. (4 hours 38 minutes).

CONCLUSION -I conclude, based on the findings of the aforementioned study, that the addition of a paracetamol suppository to caudal bupivacaine improves the quality of postoperative analgesia and extends the duration of postoperative analgesia better than caudal bupivacaine alone does in paediatric patients undergoing sub umbilical surgeries, thereby satisfying the criteria that were mentioned in the aim of the study.

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