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COMPARISON OF THE EFFECT OF ORAL, INTRAVENOUS AND RECTAL INFUSION OF PARACETAMOL FOR POSTOPERATIVE ANALGESIA UNDERGOING CESAREAN SECTION UNDER SPINAL ANESTHESIA

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ABSTRACT

Background: Caesarian delivery is one of the most commonly performed surgical procedures in women. 80% of patients experience moderate to severe pain. Early hours after birth are very important in the maternal care to communicate with the newborn and initiation of breast feeding. Paracetamol or acetaminophen is widely used non-opoid analgesics being devoid of risks related to opoids. Therefore the study was planned to compare the effectiveness of oral, intravenous and rectal paracetamol for postoperative analgesia in caesarian section. **Methods:** A prospective, randomized controlled study was conducted on paturients undergoing lower segment cesarean section in GMC Jammu. 90 paturients consisting into three groups of 30 each, were given oral paracetamol, IV paracetamol infusion and rectal paracetamol suppository, respectively and immediately after spinal anesthesia. **Results:** Post-operatively, duration of analgesia was 298.8 ± 76.3 minutes for Oral group, 326.5 ± 85.4 minutes for IV group and significantly higher at 518.0 ± 85.5 minutes for Rectal group. Time to first rescue and total number of doses were also poised significantly in favour of Rectal group. Our study showed that the perioperative outcomes of rectal administration of paracetamol were far more better and satisfactory than the parenteral or oral routes. **Conclusion:** The rectal route of administration of paracetamol improved the quality of post-operative and perioperative analgesia, without giving any side effects.

KEY WORDS: Caesarian Delivery, Postoperative Analgesia, Paracetamol, Rectal Suppository.

INTRODUCTION

Caesarian delivery is one of the most commonly performed surgical procedures in women and pain management is one of the most important aspects of postoperative care according to the previous studies, 80% of patients experience moderate to severe pain.[1] The pain causes unpleasant experiences like prolongation of recovery stress reactions, and sometimes pain induced hypoxia by stimulating sympathetic nervous system in body organs. Use of opoid analgesia for postoperative pain relief is base treatment but it can lead to various complications including excessive sleep, nausea, vomiting and spasm of the bile ducts.[2,3] It's very important regarding the maternal care of caesarian section deliveries in the early hours after birth so as to communicate with the newborn and initiation of breast feeding. Paracetamol or acetaminophen is widely used nonopoid analgesics which are devoid of risks related to opoids such as nausea, vomiting, constipation, pruritis, sedation, urinary incontinence.[4,5] Paracetamol is considered as first line treatment for pain as per world health organization (WHO). Therefore the study was planned to compare the effectiveness of oral, intravenous and rectal paracetamol for postoperative analgesia in caesarian section, the analgesic requirement in the first 24 hours in postoperative period among all the three groups.

MATERIAL AND METHODS

A prospective, randomized controlled study was conducted on paturients undergoing lower segment cesarean section under subarachnoid block in GMC Jammu, J&K, India. 90 paturients were randomized and included into three groups of 30 each: 30 were given oral paracetamol tablets 650 mg (1 tablet) as premedication 20 min before shifting to operation, and considered as group 1, 30 were administered IV paracetamol infusion of 10-15 mg/kg over 15 minutes duration 20 min before the end of surgery and considered as group 2, and 30 were administered rectal paracetamol suppository 35-45 mg/Kg immediately after spinal anesthesia and considered as group 3.

Inclusion Criteria: Parturients in the age group 17-40 years belonging to ASA class 1 and 2, term pregnancy, without chronic diseases like cardiovascular problems, hepatic and renal diseases, devoid of drug addiction, were included in this study.

Exclusion Criteria: Parturients with hypersensitivity to paracetamol, history of alcoholism or drug abuse, bleeding diathesis or coagulation disorders, unable to rate their pain on scales used due to psychiatric or other reasons, severe allergic, hepatic, renal, cardiovascular or peripheral nervous system disease, chronic abdominal pain or on the treatment with analgesics and anticoagulant, were excluded.

Data were collected in proforma meeting the objectives of the study. Details pertaining to patients' clinical history, general physical examination and basic routine investigations such as hemoglobin, bleeding time, clotting time, urine for albumin, and sugar were noted. All patients were premedicated in the night before surgery and 6 am in the morning with tablet rantidine. 150 mg. IV line was started with 18 gauge needle, and loading with ringers lactate 500ml was done. Monitoring was done using multi-parameter monitor having electrocardiography (ECG), noninvasive blood pressure (NIBP) and arterial were taken to Operation Theater in left lateral position.

Under all aseptic precautions, lumbar puncture was performed at the level of L2-L3 /L3-L4 through a midline approach using 25 gauge quinke's spinal needle and 0.5% bupivacaine 2.2ml was injected after the confirmation of needle tip in the subarachnoid space by clear and free flow of cerebrospinal fluid. After delivery of baby, injection oxytocin was given as slow 0.3-1 IU bolus over 1 min followed by an infusion of 5-10 IU for 4 hr. All the three groups of patients received oxygen 4L/min via facemask. Fetal parameters were noted. Continuous intraoperative monitoring was done and heart rate, RR, SPO2 and ECG were recorded, every 5 min for the first 20 min, then at an interval of 10 min till the end of the surgery. Readings were noted in the recovery room for every 15 min for 2 hr and in the postoperative ward every 2 hourly for the next 10 hr, then at 16, 20, and 24 hr (except for SPO2 and ECG which were noted only up to recovery room) neonatal APGAR scores at 1, 5 and 10 min after birth were recorded. Duration of analgesia is defined as the time interval between administration of the study drug and visual analog scale (VAS) of >4 was considered to administer first top up. Pain intensity was measured using VAS immediately in recovery room then 2 hourly till 24 h postoperative in the ward. (VAS (0-10) point scale: 0- no pain, 1-3- mild pain, 4-7- moderate pain, 8-10- severe pain.) Rescue analgesia was given for pain score >4 in the form of intramuscular diclofenac sodium 75 mg. Duration of analgesia, time to first rescue analgesia, total dosage and number of doses of rescue analgesia consumed in 24 h in an individual patient were also studied as secondary outcomes. Hemodynamics was monitored both intraoperatively and postoperatively. In the postoperative period, patients were also monitored for adverse effects like: including nausea, vomiting and abdominal pain, bleeding etc.

This study had the prior approval of the Institutional Ethical Committee and a prior informed consent was also taken from all the paturients. The data was analyzed using Chi Square test for non-parametric data and ANOVA test for parametric data. SPSS software version 11 was used.

RESULTS

Demographic distribution was comparable in the three groups.

Table 1: Demographic Distribution.

Variable	Group 1 (Oral Paracetamol) n=30	Group 2 (Intravenous Paracetamol) n=30	Group 3 (Rectal Paracetamol) n=30
Age	26.12 ± 3.20	25.98 ± 3.19	26.29 ± 3.02
ASA PS			
ASA I	45	44	46
ASA II	5	6	4

ASA = American Society of Anesthesiologist (Physical Status)[6]

Post-operatively, the duration of analgesia was significantly longer in Group 3 (rectal paracetamol) as compared to the other two groups. The results were significant as the duration of analgesia was 298.8 ± 76.3 minutes for Oral group, 326.5 ± 85.4 minutes for IV group and significantly higher at 518.0 ± 85.5 minutes for Rectal group. Time to first rescue and total number of doses were also poised significantly in favour of Rectal group (Group 3).

Table 2: Perioperative Outcomes.

Secondary Outcomes	Mean ± SD (n=30)			P Value		
	Group 1	Group 2	Group 3	Group1 : Group 2	Group1 : Group3	Group2 : Group3
Duration of Analgesia (Minutes)	298.8 ± 76.3	326.5 ± 85.4	518.0 ± 85.5	0.786	< 0.001*	< 0.001*
Total Number of Doses of Rescue Analgesia	2.44 ± 0.56	2.05 ± 0.48	1.62 ± 0.41	0.536	< 0.001*	0.003

Time to first rescue Analgesia (Minutes)	302.4 ± 77.9	329.8 ± 86.0	533.6 ± 88.3	0.881	< 0.001*	< 0.001*

*p < 0.001 = highly significant; SD = Standard Deviation
The neonatal outcome also had no effect due to the route of administration of drug. No significant adverse effects of any kind were observed in any of the three groups.

DISCUSSION

Paracetamol has been widely used as an effective analgesic and an antipyretic agent, it has an established efficacy and wide safety profile. Paracetamol is the most commonly prescribed drug for the treatment of pain as a mono-therapy as well as multimodal therapy.[4]

Paracetamol is a cheap drug, recommended by WHO to be used as a starting point for analgesic regimes. Its perioperative use is common, for improving analgesia and to reduce the need of opioids. It can be administered orally, parenterally and rectally.[5]

Inadequate management of pain in the postoperative period, can lead to physiological and psychological changes, leading to more morbidity and mortality.[3] Rectal route for the administration of analgesics like paracetamol, can be the preffered one, when there is a need to bye pass the first metabolism route or in unconscious patients or among children. This also leads to avoidance of pain associated with parenteral route and gastric irritations as well. The duration of analgesia increases in such cases possibly due to the slower absorption of rectal acetaminophen, causing to peak the plasma concentration after 2-3 hours, while in IV form of administration, it peaks quite early at 15 to 20 minutes. The analgesic effects of rectal acetaminophen last longer.[6-8]

Our study showed that the perioperative outcomes of rectal administration of paracetamol were far more better and satisfactory than the parenteral or oral routes. This was quite in accordance with the conclusions by Marzban et al and Kulkarni et al, who had studied the same with respect to children undergoing minor surgery. Prolonged analgesia and enhanced time to attain maximum concentration, lead to reduced values of rescue analgesia in rectal group. This stressed upon the similarity of results with our findings and the safety associated with such types.

Other significant studies by Aleagha et al, Bhandari et al, also concluded on similar lines, however the study groups comprised of children mainly, who had better acceptability of rectal route in comparison to the parenteral / IV route.[12, 9]

CONCLUSION

The rectal route of administration of paracetamol among susceptible community like children and women undergoing lower segment cesarean section, improved the quality of post-operative and perioperative analgesia, without giving any side effects.

REFERENCES

1. Dahl JL, Gordon D, Ward S, Skemp M, Wochos S, et al. Institutionalizing pain management: The post-operative pain Management quality improvement project. J Pain., 2003; 4(7): 361-71.
2. Apfelbaum JL, Chen C, Mehta SS, Gan TJ,. Postoperative pain experience: results from a national survey suggest postoperative pain continues to be undermanaged. Anaesthesia & Analgesia., 2003; 97(2): 534-40.
3. Lee SY, Lee WH, Lee eH, Han KC, Ko YK. The effects of paracetamol, ketorolac, and paracetamol plus morphine on pain control after thyroidectomy. Korean J Pain., 2010; 23(2): 124-30.
4. Neugebauer EA, Althaus A, Simanski C, Acute pain management. Rural Surgery. 2011; Springer: 67-75.
5. Cattabriga I, Pacini D Lamazza G, Talarico F, Di Bartolomeo R, Grillone G. Intravenous paracetamol as adjunctive treatment for postoperative pain after cardiac surgery: a double blind randomized controlled trial. Eur J Cardiothorac Surg., 2007; 32(3): 527-31.
6. Abouleish AE, Leib ML, Cohen NH. ASA provides examples to each ASA physical status class. ASA Monitor, 2015; 79: 38-9.
7. Pasero C, Stannard D. The role of intravenous acetaminophen in acute pain management: A case-illustrated review. Pain Manag Nurs., 2012; 13: 107-24.
8. Kulkarni R, Dave N, Bartakke A, Nair A, Kadam PP, Thatte UM, *et al*. Pharmacokinetics of rectal compared to intravenous paracetamol in children undergoing minor surgery. Indian J Pharmacol., 2007; 39: 187-91.
9. Prakash M, Yachendra V, Manohar P. Comparison of efficacy of intravenous paracetamol and intravenous tramadol for post operative pain in patients undergoing infraumbilical surgeries. J Dent Med Sci., 2016; 15: 24-9.
10. Marzban S, Haddadi S, Karami MS, Heidarzadeh A, Parvizi A, Nabi BN. Comparing the duration of the analgesic effects of intravenous and rectal acetaminophen following tonsillectomy in children. Anesth Pain Med., 2014; 3: 1-7.
11. Paseron C, Standard D. The role of intravenous acetaminophen in pain management. Am Soc Pain Manage, 2012; 13: 107-24.
12. Aleagha AE, Behzadi M, Jafarich A, Hajimohamadi F. Effects of prophylactic rectal versus oral acetaminophen on postoperative conditions in pediatric adeno tonsillectomy patients: A randomized clinical trial. Arch Anesthesiol Crit Care, 2015; 1: 39-41.

13. Bhandari G, Mitra S, Shahi KS, Rani A, Chauhan R, Satrunjay. Analgesic efficacy of intravenous versus rectal acetaminophen after adenotonsillectomy in children. J Med Dent Sci., 2015; 4: 3933-9.