A COMPARATIVE EVALUATION OF SINGLE DOSE TRANSDERMAL PATCH OF DICLOFENAC VERSUS KETOPROFEN FOR POST OPERATIVE ANALGESIA IN ABDOMINAL HYSRECTOMY.

Anaesthesiology

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ABSTRACT

Introduction: Transdermal patch is very simple and painless method for providing postoperative analgesia. The aim of the study was to compare the efficacy and safety of transdermal patch of ketoprofen in comparison to diclofenac for post operative analgesia. It is randomized observational study.

Method: Thirty six patients of 18 to 60 years were randomly allocated to receive either ketoprofen or diclofenac transdermal patch at the end of surgery under spinal anaesthesia. Statistical analysis used, data were analysed using statistical package for social sciences version 15.0 and open EPI software version 2.3. The primary end point is VAS score and total requirement of rescue analgesic first 24 hours of surgery. The secondary end points are time to rescue analgesic and adverse effects like nausea and vomiting.

Conclusion: Single dose transdermal patch of Ketoprofen provided better post operative analgesia as compared to diclofenac sodium patch in abdominal hysterectomy (inframbilical surgeries) and less number of patients required rescue analgesia in ketoprofen group.

KEYWORDS

INTRODUCTION:

Postoperative pain after any type of surgery can have detrimental effects and if appropriate analgesia is not provided, it can affect respiratory, cardiovascular, gastrointestinal, urinary and as well as chronic effect like delayed recovery and chronic pain. Most commonly used drugs for post operative analgesia are NSAIDs worldwide. They can be used orally intravenously, intramuscularly and as transdermal patches. Transdermal delivery drug system avoids the pain associated with i.v. and i.m. routes and is an option for patients who don't tolerate the oral drugs especially in post operative period. Also topical NSAIDs have a reduced risk for upper gastrointestinal complications such as gastric and peptic ulcers and dyspepsia. The drug contained in the transdermal patch enters the body through skin and then diffuse into capillaries for systemic delivery. Diclofenac was patented in 1965 and came into medical use in 1988. The steady permeation of drug across the skin allows for consistent and uniform drug levels. Diclofenac Sodium is NSAIDs chemically 2-phenylacetic acid commonly used drug for both cyclo-oxygenase and II and causes decrease in prostaglandin production. It is an oxo monocarboxylic acid that consist of propionic acid substituted by a 3-benzoylphenyl group at position 2. Chemically it is 2-(3-benzoylphenyl)-propionic acid, one of the propionic acid class of NSAIDs and has analgesic and antipyretic effects. Ketoprofen inhibits the activity of the enzymes cyclo-oxygenase and II, resulting in decreased formation of prostaglandins and thromboxane A₂. Ketoprofen oral, iv and im preparation has been used for post operative analgesia. This study will compare the effects of single dose transdermal patch of diclofenac sodium with ketoprofen for patients undergoing inframbilical surgeries under spinal anaesthesia. Aims and objective of study was to compare transdermal patch of diclofenac and ketoprofen for Assessment of post operative analgesia, Duration of analgesia, Need for rescue analgesia during first 12 hrs. The primary end point was VAS score and total requirement of post rescue analgesic in first 12 hours of surgery. The secondary point were time to rescue analgesic and adverse effect like nausea and vomiting.

MATERIALS AND METHODS

The study was conducted among the patients posted for abdominal hysterectomy admitted to our tertiary care hospital. The Study Design was Observational Study and Study Duration was 6 months Sample Size was total 36 cases, 18 cases in each group. Inclusion criteria were Physical status ASA I/II, age groups between 18 to 60 years and inframbilical (abdominal hysterectomy). Exclusion criteria were patients with ASA III or higher, patients with known case of cardiovascular, neurological, psychiatric, renal disease. Patients with spinal deformities, coagulation disorders, infection at puncture site

and hypersensitivity to NSAIDs were also included in exclusion criteria of the study. Pre-anaesthetic check up was done and routine investigation were carried out. After confirming NBM status and explaining about the procedure, written informed consent was taken. On day of surgery, iv line was secured and routine monitors were attached to the patients in operation theatre. Both groups did not receive any intravenous analgesics or sedatives during surgery. On arrival in operation room patients was preloaded with Injection Ringer-Lactate 10ml/hr slowly. Under all aseptic precaution spinal anaesthesia was performed using 25G spinal needle, in sitting position, with midline approach in L2-L3 or L3- L4 intervertebral space. After negative aspiration for clear free CSF, inj Bupivacaine heavy(0.5%) 4 ml injected intrathecally. Spinal level achieved T6 and effect was satisfactory. The 36 participants in the study were randomly allocated into two groups of 18, using a computer generated randomization table. Group D(n=18) in which Single dose of transdermal diclofenac patch 100 mg (Nupatch from Zydus Cadila 100mg per 50cm²) applied and In Group K(n=18), Single dose of transdermal ketoprofen patch 20 mg (Ketoplast patch from Zaventus 20mg per 70cm²) applied over deltoid muscle. Post-operatively Pain was assessed by VAS score. Time of first request for Post Operative analgesia when VAS≥4. When VAS≥4 Inj Tramadol 100 mg iv was given and that time was calculated as total Duration of analgesia. Side effects like allergy, nausea, vomiting, itching were noted.

RESULTS

We have included total 36 patients in this study (18 in each group). The demographic profile of both groups were comparable (table 1). The average age of patients in group D was 45.4±9.2 years and 43±9.3 years in group K (P>0.05). The duration of surgery in group D was 132±20.3 min and 129±19.2 min in group K (P>0.05). The post-operative VAS score in group D at 3, 6, 9, 12, 16, 20, 24 hours was assessed When VAS score was ≥4 Inj tramadol 1 mg/kg followed by inj Ondansetron 0.1-0.2 mg/kg. Time until rescue analgesia was assessed i.e. duration of analgesia. Frequency of additional analgesia over 24 hour was noted. We did not observe any significant allergic reaction to any of the drug patches.

Demographic Profile (table 1)

Characteristics	Group D	Group K	P value
Ages (years)	45.4±9.2	43±9.3	0.4
Sex (M:F)	12:6	11:5	0.4
Weight (kgs)	51± 3.2	50±2.4	0.7
Duration of surgery (in min)	134±20.3	129±19.2	0.13

After spinal anaesthesia at the end of surgery Group D(n=18) in which Single dose of transdermal diclofenac patch 100 mg (Nupatch from Zyclus Cadila 100mg per 50cm²) applied and In Group K(n=18), Single dose of transdermal ketoprofen patch 20 mg (Ketoplast patch from zuventus 20mg per 70cm²) applied over deltoid muscle. Post-operatively Pain was assessed by VAS score. Time of first request for Post Operative analgesia when VAS $\geq$ 4. When VAS $\geq$ 4 Inj Tramadol 100 mg iv was given and that time was calculated as total duration of analgesia.

The time until request of additional analgesia was (4 $\pm$ 1.8) hr in group-D (Diclofenac sodium) group and (6 $\pm$ 2)hr in group-k (ketorolac). Which was statistically significant (p<0.001).

The frequency of additional analgesia in 12 hrs was assessed to be (2 $\pm$ 0.98)times in group-D as compared to (1 $\pm$ 0.88)times in group K which was statistically significant (p<0.001).

DISCUSSION:

The skin offers an accessible and convenient site for the administration of medications. The field of transdermal drug delivery system, aims at developing safe and efficacious means of delivering medications across the skin for pain management in postoperative period as it avoids the first pass metabolism and gastrointestinal complications associated with oral route and pain associated with i.m. or i.v. Route. NSAIDs are the commonly used drug for postoperative analgesia. This study was done to compare the effects of single dose transdermal patch of diclofenac sodium with ketoprofen for patients undergoing infraumbilical surgeries under spinal anaesthesia. Duration of postoperative analgesia by ketoprofen (6 Hr) transdermal patch was more as compared to diclofenac sodium patch (3 Hr).

Reetu verma et al in 2016 compared single dose transdermal patches of diclofenac sodium and ketoprofen for postoperative analgesia in lower limb orthopaedic surgery. They have observed that VAS score remained significantly low in ketoprofen group as compared to diclofenac group.

Pranavi Jdhav et al in 2017 conducted a study to compare efficacy of diclofenac and ketoprofen on 50 patients undergoing bilateral jaw surgical procedures. They observed that post operative analgesia duration was longer in ketoprofen(20hrs) group as compare to diclofenac(13hrs) group. 4% patients in ketoprofen and 12% in diclofenac group required rescue analgesia.

CONCLUSION:

Single dose transdermal patch of Ketoprofen provided better post operative analgesia as compared to diclofenac sodium patch in infraumbilical surgeries and less number of patients required rescue analgesia in ketoprofen group.

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