Comparison of Ketoprofen and Morphine for Post-operative Analgesia in Orthopaedic Patients

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Abstract

A prospective, open label, randomized study to compare efficacy of intramuscular administration of ketoprofen and morphine for post operative analgesia in elective orthopaedic surgery was performed in 50 patients. The procedures were open reduction and internal fixation of long bone fractures (26 cases), hip replacement (9 cases) and spinal surgery (15 cases). Pain intensity and pain relief in both groups were evaluated at 1, 3 and 6 hours post-injection. There was no significant differences in pain relief of both groups (P=0.05). The side effects of intramuscular ketoprofen were encountered in only 8 per cent.

Ketoprofen injection is an alternative for post operative pain relief.

In 1977, Mena-Bernal Romeo[1] studied the analgesic effect of ketoprofen in traumatized and post orthopaedic surgery patients. The study showed that[1] 100 mg of ketoprofen administered intramuscular every 12 hours was effective enough to relieve the pain[2]. The efficacy of ketoprofen began 5-15 minutes after administration and could be maintained longer than 6 hours. Ketoprofen is a non steroidal anti inflammatory drug (NSAID).

These drugs can inhibit the cyclo-oxygenase, hence decreasing the synthesis of prostaglandins. (Prostaglandins are able to stimulate pain receptor). This means the NSAID have a local effect on pain receptors[2]. Furthermore, P. Netter[3] et al could detect ketoprofen in the spinal fluid after 15 minutes intramuscular injection. Futhermore, Willer[4] et al found that ketoprofen can inhibit the nociceptive reflex at the spinal level. So, ketoprofen has both a local and a central mechanism to relieve pain. Besides, the study of Castagnera L[5] et al in 1988 insisted on the ability of ketoprofen to relieve pain in 96.6 per cent of post orthopaedic surgery patients.

Narcotics are currently used for post operative analgesia, but respiratory depression[6] may occur if the user has no experience to handle

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them properly. This brought the idea of using the analgesic effect of NSAID instead of narcotics.

This study compares the efficacy of ketoprofen and morphine for the relief of post orthopaedic surgery pain, since there has been no report on the comparison of these two drugs before.

MATERIAL AND METHOD

From January 1995 to December 1995, a prospective open label randomised comparative study was carried out in the Orthopaedic Institute, Lerdsin Hospital. Two groups of patients were treated : Group A (25 patients) received ketoprofen 100 mg and Group B (25 patients) received morphine 6 mg intramuscularly q 12 hours and 6 hours respectively[1,7].

The elective orthopaedic procedures were catagorized into 4 types, type I - open reduction and internal fixation (ORIF) of the upper extremities. Type II - open reduction and internal fixation of the lower extremities. Type III - hip replacement and type IV - spinal surgery. Informed consent was given before drug administration. Patients were able to understand and mark their status on a visual analogue scale (VAS)[8].

Patients with any history of allergy to NSAID, seizure, kidney disease, lung disease, liver disease, peptic ulcer and patients receiving lithium, methotrexate, MAO inhibitors, anticoagulant were all excluded.

The post operrative pain was evaluated by a visual analogue scale. As an inclusion criteria, the initial pain, as evaluated on the VAS of 100 mm should be over 30 mm.

The efficacy of the drugs and the pain relief were evaluated by the patients at 1, 3 and 6 hours using scale 0, 1, 2, 3, 4 for pain and pain relief.

According to pain evsluation ; scale 0 for absence of pain 1 for mild pain, 2 for moderate pain, 3 for severe pain and 4 for very severe pain.

According to pain relief ; scale 0 for nil pain relief, 1 for mild pain relief, 2 for moderate pain relief, 3 for major pain relief and 4 for complete pain relief.

The patients who did not improve in 2 hours following intramuscular injection received 2 tablets of paracetamol 500 mg. Patients who had no improvement were considered as failures.

On the second and third post operative days, pain was evaluated at 8:00 a.m. and 8:00 p.m. The overall efficacy of the drugs was evaluated by the patients on the 3rd post operative day using a 4 level scale. Scale 0 for nil, 1 for mild, 2 for good and 3 for excellent.

RESULT

The age, the gender of the patients in both groups and the types of operation are shown in Table 1 and 2. The mean post operative pain fol-

Table 1. Demographic data : Sex and age.

Drug	Male	Female	Total	Mean age (year)
Ketropofen	20	5	25	36.84 (17-66)
Morphine	19	6	25	33.92 (17-62)

Table 2. Type of operation.

Type of operation	Number	Ketoprofen	Morphine
I ORIF in upper extremities	11	5	6
II ORIF in lower extremities	15	8	7
III Hip-replacement	15	7	8
IV Spinal surgery	9	5	4
Total	50	25	25

lowing surgery as measured on the VAS was 62.67 milimetres. The lowest mean pain was recorded in patients with ORIF of upper extremeties = 52.54 millimetres. The highest mean pain was recorded in patients with hip replacement = 68.89 millimetres. There was no statistically significant difference for the level of post operative pain and pain relief in both groups (Chi-square test, p = 0.05).

On the second post operative day, 14 patients (28.6 per cent) had pain of more than 30 millimetres as measured on the VAS. On the third post operative day, 3 patients (one in group A, two in group B) required drugs to relieve pain.

On the second and third day, Type I patient did not need more drug. Some type II patients (33.3 per cent), Type III patients (33.3 per cent), and Type IV patients (57.14 per cent) needed more drugs.

One patient (avascular necrosid of both hips) was considered as a failure. For total efficacy, 92 per cent of group A (ketoprofen) and 88 per cent of group B (morphine) got satisfactory results following intramuscular injection. There was no statistically significant difference. (Chi-square test, p = 0.05).

The adverse reactions in group A (ketoprofen) were pain at the injection site (2 patients), itching at the injection site (1 patient) and nausea (1 patient). There was no adverse effect in 25 patients of group B (morphine).

DISCUSSION

Ketoprofen can reduce pain after general surgery, malignancy pain, dentistic pain and kidney pain[9-13]. Langlais[12] et al compared ketoprefen and pethidine after orthopaedic surgery and reported that both drugs could reduce initial post operative pain of 66.7 per cent and 63.7 per cent respectively. Docquier et al[14], 1987 reported that 73.9 per cent of orthopaedic surgery patients were satisfied with ketoprofen to reduce the post operative pain and 70.5 per cent were satisfied in the pentazocine group.

In this study, more patients in group A (ketoprofen) (92 per cent) were found to have satisfactory results from intramuscular drug injection than patients from group B (morphine) (88 per cent) even though there was no statistical difference between the two groups. The efficacy of ketoprofen and morphine is nearly similar. (Both have comparable half lifes and plasma concentrations[15]).

Of the four types of surgery, type III (hip prothesis replacement) had the highest mean pain as measured on the VAS (68.89 millimetres) while type I had the lowest (52.54 millimetres).

Hip surgery needs more dissection, causes more blood loss and more extensive manipulation than open reduction and fixation of the long bone fracture. Serratrice[16] studied the adverse effects of ketoprofen and reported that 5 per cent of patients had pain at the injection site, 12.6 per cent had side effects in the gastrointestinal tract, 2 per cent had headache and 3 per cent had to stop administration of ketoprofen. In this study, we found that 8 per cent of patients group A (Ketoprephen) had pain at the injection site and 4 per cent had itching and nausea.

As for the cost of the drug, patients in the ketoprofen group paid 100 Bahts per day and patients in the morphine group paid 60 Bahts per day. The two times per day administration of ketoprofen can reduce the workload of the medical staff compared to four times intramuscular morphine. The patients are also didturbed less frequently.

SUMMARY

Intramuscular ketoprofen has a similar efficacy compared to intramuscular morphine. Minor side effects can be encountered following ketoprofen injection. The two times per day administration of Ketoprofen is easier for the patient and the medical staff than the four times per day administration of Morphine.

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การศึกษาเปรียบเทียบผลการลดปวดของยาคีโตโปรเฟน และมอร์ฟีนในผู้ป่วยหลังผ่าตัดทางออร์โธปิดิกส์

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จากการศึกษาเปรียบเทียบถึงประสิทธิภาพในการบรรเทาอาการปวดหลังการผ่าตัดออร์โธปิดิกส์ ระหว่างยาคีโตโปรเฟน และยามอร์ฟีนโดยวิธี prospective, open label, randomized and comparative ในผู้ป่วยออร์โธปิดิกส์ที่ได้รับการผ่าตัดดามเหล็กที่แขน, ขา ผ่าตัดเปลี่ยนข้อสะโพกและผ่าตัดกระดูกสันหลังจำนวน 50 ราย พบว่ายาฉีดบรรเทาอาการปวด ในชั่วโมงที่ 1 , 3 และ 6 หลังฉีดยาไม่พบความแตกต่าง อย่างมีนัยสำคัญที่ (P=0.05) ในผู้ป่วยทั้ง 2 กลุ่ม อาการข้างเคียงจากยาคีโตโปรเฟน พบเพียงร้อยละ 8 ดังนั้นยาคีโตโปรเฟนจึงเป็นอีกทางเลือกหนึ่งของการบรรเทาอาการเจ็บปวดหลังผ่าตัดออร์โธปิดิกส์

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