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RETROSPECTIVE STUDY

The role of diclofenac and piritramide in the management of acute postoperative pain in hernioplasty

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Abstract: *Objectives:* The aim of the study was to compare the effects of diclofenac and piritramide in acute postoperative pain after hernioplasty.
Background: In the treatment of moderate acute postoperative pain, non-steroidal anti-inflammatory drugs and opioids play the major role. The data on safety and effect of analgesia based on opioid and non-opioid drugs are still a controversial topic.
Methods: We compared the first-line treatment effects of diclofenac and piritramide in 105 patients after hernioplasty in a retrospective manner. The subsequent therapy combined piritramide with diclofenac. We evaluated the intensity of pain and its relief using a visual analogue scale (VAS). We also evaluated the necessity of application of other analgesics.
Results: One hour after the application of the first analgesic dose, we observed complete pain relief in 39.5 % of patients treated with piritramide and in 19.4 % of patients treated with diclofenac ($\chi^2 = 5.17$; $p = 0.02$). After the use of piritramide, the pain relief (3.84 ± 1.27 mm) was significantly higher than after diclofenac (3.34 ± 0.77 mm). Another injection was needed in 76 % and 54 % of patients subjected to first-line treatment based on diclofenac and piritramide, respectively.
Conclusion: We observed that the first-line analgesic treatment based on piritramide was more effective when compared to that based on diclofenac *(Tab. 3, Ref. 3)*. Full Text in free PDF *www.bmj.sk.*
Key words: analgesia, diclofenac, piritramide, hernioplasty, postoperative pain, human.

Abbreviations: ATC – Anatomical Therapeutic Chemical, classification system, DDD – Defined daily doses, VAS – Visual analogue scale, NNT – Number needed to treat.

Postoperative pain increases the discomfort and stirs up concerns in patients. Unfortunately, we are still unable to alleviate completely the pain in as many as one-third of patients in postoperative period (1). Currently, we dispose of a series of analgesic medicaments enabling to increase the success rate in daily practice. In the treatment of moderately severe acute postoperative pain, non-steroidal anti-inflammatory drugs and opioids play the major role. The main advantage of non-steroidal anti-inflammatory drugs is that they do not influence the peristaltics and blood circulation and do not bear the risk of inhibiting the breathing and consciousness. Their main disadvantages include insufficient pain relief and gastrotoxicity, as well as=antiaggregation and nephrotoxic effects in patients with hypokalemia. The aim of this study is to compare the analgesic effects of diclofenac and piritramide when used as first-line treatment of acute postoperative pain after hernioplasty.

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Materials and methods

We enrolled 105 patients requiring inguinal hernioplasty into this retrospective study. All patients were operated under general anesthesia and subjected to standard inguinal hernioplasty according to Lichtenstein. In all patients, the surgeries were carried out in 2009. We enrolled only patients taking no non-steroidal anti-inflammatory drugs or opioids. For premedication, we used peroral diazepam. General anesthesia was performed under the combination of propophol and sulphentanyl.

The intensity of postoperative pain was evaluated before the administration of analgesics and one hour after their administration using 100 mm visual analogue scale (VAS). We enrolled only patients with initial pain intensity higher than 40 mm, where the postoperative pain was treated by administration of diclofenac (Dolmina 75 mg, inj., sol., Zentiva, i.m.) or piritramide (Dipidolor 15 mg, inj., sol, Janssen-Cilag s.r.o., i.m.). From values obtained from VAS, we calculated the pain relief (the difference between the values measured before the drug administration and one hour after it) in absolute values as well as in percentage. The patients who were free of pain one hour after the first injection of analge-

Tab. 1. Basic characteristics of both groups of patients. Data are reported as mean ± S.D. Ns. – nonsignificant.

	Piritramide	Diclofenac	p
Number	43	62	–
Age (years)	52.16±13.05	55.61±12.19	NS
BMI (kg/m^2)	25.51±3.07	27.17±5.09	NS
Gender (male/female)	33/10	56/6	NS
Duration of operation (min)	51.09±18.71	51.76±16.84	NS
Duration of anesthesia (min)	74.88±24.26	75.65±20.52	NS

Tab. 2. Comparison of effects of analgesic first-line and second-line treatments and their relation to duration of hospitalization. Data are reported as mean ± S.D. Ns - nonsignificant.

	Piritramide	Diclofenac	p
Number	43	62	–
Initial pain intensity (VAS)	4.75±1.03	4.39±0.49	NS
Pain relief (VAS)	3.84±1.27	3.34±0.77	0.0262
Pain relief (%)	81.40±19.90	76.53±14.92	0.030
Interspace between first and second applications (min)	458.04±181.93	348.15±258.98	0.01
No. of subsequent applications	1.7±0.88	2.7±1.74	0.015
Duration of hospitalization (days)	1.09±0.81	1.45±0.95	0.0260

Tab. 3. Other administration of analgesics and defined daily doses (DDD). Data are reported as mean ± S.D. Ns - nonsignificant.

	Piritramide	Diclofenac	p
Number	23	47	–
	No of injections		
Piritramide	1.00 ± 0.000	1.706±0.772	0.015
Diclofenac	1.20 ± 0.422	1.375±0.744	NS
Combination	2.75 ± 0.463	3.955±1.703	NS
	No of DDD		
Piritramide	0.333 ± 0.000	0.449 ± 0.273	0.00001
Diclofenac	0.858 ± 0.362	0.927 ± 0.329	0.024
Combination	1.364 ± 0.252	1.795 ± 0,720	NS

sic were evaluated separately. ATC/DDD methodology was used to assess the drug consumption (2). The data are reported as mean ± standard deviation. For statistical evaluation, we used χ^2, Mann-Whitney test and Wilcoxon test for two dependent variables ($p < 0.05$).

Results

In all patients, the operation was performed with no significant complications. We observed no significant differences between both groups of patients concerning the demographic data, duration of operation or duration of anesthesia (Tab. 1).

The pain relief was significantly increased in patients treated with piritramid (Tab. 2). One hour after the administration of piritramide, 39.5 % of patients described total pain relief whereas one hour after the administration of diclofenac, only 19.4 % of patients described total pain relief ($\chi^2 = 5.17$; $p = 0.02$). In the group of patients with first-line administration of diclofenac, 76 % of patients required an administration of other analgesics, whereas in the group of patients with first-line administration of piritramide, only 54 % of patients required an administration of other analgesics ($\chi^2 = 5.69$; $p = 0.02$). From these data, we could assume that the interspaces between drug administrations in the group of patients treated with piritramide would be longer and the number of particular doses would decrease.

The required number of following injections was lower in all groups with initial piritramide administration when compared to respective diclofenac groups; however, the statistical significance was reached only in the group with subsequent piritramide administration (Tab. 3). The number of defined daily doses (DDD) was lower in all groups given piritramide as first-line treatment when compared to respective diclofenac groups while the statistical significance was reached only in groups with subsequent piritramide and diclofenac administrations (Tab. 3). The mean total number of subsequent injections was 2.70±1.74 after the initial diclofenac administration and 1.60±0.86 after the initial piritramide administration.

Discussion

From the view of evidence-based medicine, the comparison of analgesic effects is made using the numbers of patients in need of treatment (NNT) due to acute postoperative pain. This value reflects how many patients have to be treated to observe at least 50% relief from pain (with no treatment effect when placebo is used). According to these data, the analgesic effects of opioids and non-steroidal anti-inflammatory drugs are often comparable. After one-dose administration of 50 mg of diclofenac, NNT equaled 2.3 (reference ratio 2.0–2.7), whereas after one-dose administration of 10 mg of morphine, NNT equaled 2.9 (reference ratio 2.6–3.6). We can assume that NNT of an equianalgesic dose of 15 mg of piritramide would correspond to NNT of morphine.

This retrospective study originated from clinical experience of our Department based upon analgesic effect-based titration of analgesic dose and minimization of undesired effects. Either the dose of the drug was repeated or an alternative treatment was selected. The pain intensity was evaluated by patients using VAS. Our results indicate a better analgesic effect and a decrease in the necessity of subsequent analgesic doses in patients with initial piritramide administration. Analgesic therapy based on a single type of drug is insufficient in moderately severe acute postoperative pain. The most frequently used second-line therapy was based upon a combination of a non-steroidal anti-inflammatory drug and opioid analgesic, which is consistent with recommendations for the treatment of moderately severe acute postoperative pain (3). The pain was sufficiently treated either when the mechanisms of action of first-line and second-line treatment analgesics were synergistic, or (however only in a small number of patients) when their mechanisms of action were identical.

Conclusion

We observed that the analgesic effect was higher and of longer duration in patients whose first-line treatment of pain was based on piritramide when compared to those treated with diclofenac as first-line treatment. The subsequent therapy combined piritramide and diclofenac. From the view of pharmacological load and minimization of side effects, the use of piritramide as first-line treatment is a method of choice in patients with moderately severe acute postoperative pain.

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