

Preoperative diclofenac sodium reduces post-laparoscopy pain

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*Post-laparoscopy pain can increase recovery time and delay patient discharge. While previous studies have focused on the problems of nausea and vomiting, the purpose of this study was to assess the effect of diclofenac (a non-steroidal anti-inflammatory drug) in the treatment of post-laparoscopy pain. Diclofenac (50 mg) or placebo was administered *pr* randomly and double-blind, prior to induction of anaesthesia, to 46 women. Pain intensity was assessed by the patient using a visual analogue scale 1, 12 and 24 hr after surgery. Postoperative analgesic requirements and side effects were also studied. Diclofenac resulted in better pain relief at 24 hr (1.0 vs 2.5, $P < 0.05$) and reduced the number of patients who needed additional postoperative analgesics (7 vs 15, $P < 0.05$). There was no difference in the incidence of side effects. These data suggest that diclofenac reduces post-laparoscopy pain and postoperative analgesic requirements.*

La douleur postlaparoscopique ralentit la récupération et retarde le congé. Alors que des études antérieures portaient sur les phénomènes de nausées et de vomissements, l'objectif de cette étude est d'évaluer les effets du diclofénac (un anti-inflammatoire non-stéroïdien) sur la douleur postlaparoscopie. Le diclofénac 50 mg ou un placebo sont administrés à 46 femmes au hasard et à double insu par la voie rectale avant l'induction de l'anesthésie. L'intensité de la douleur est évaluée par la patiente à l'aide d'une échelle visuelle analogique 1 hre, 12 et 24 hres après la chirurgie. Les besoins analgésiques postopératoires et les effets secondaires sont aussi étudiés.

Key words

ANALGESICS: diclofenac;
PAIN: postoperative;
SURGERY: laparoscopy.

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Le diclofénac produit un meilleur soulagement à 24 hres (1,0 vs 2,5, $P < 0,05$) et diminue le nombre de patientes qui ont besoin d'analgésiques additionnels (7 vs 15, $P < 0,05$). Il n'y a pas de différence dans l'incidence des effets secondaires. Ces données suggèrent que le diclofénac diminue la douleur post-laparoscopie et les besoins postopératoires d'analgésiques.

In many patients post-laparoscopy pain is severe and difficult to manage.¹ In a recent study, peritoneal biopsy, performed two or three days after laparoscopy, showed peritoneal inflammation resulting from capillaries which were torn at the time that the abdomen was distended with gas. In the same study a linear relationship was found between abdominal compliance at the time of laparoscopy and the severity of postoperative pain.² Postoperative pain control using non-steroidal anti-inflammatory drugs (NSAIDs) may reduce peritoneal inflammation and consequently reduce the pain. The purpose of this study was to assess the analgesic efficacy of rectally administered diclofenac before surgery on postoperative pain following gynaecological laparoscopy.

Methods

After approval of the protocol by the Ethical Committee of the Faculty of Medicine of the University of Lund, informed written consent was obtained from 49 women, ASA I-II, who required laparoscopic surgery. If laparotomy was performed, the patient was excluded from the study. Each patient was allocated to one of the study groups according to a random number sequence.

Procedure

All patients underwent laparoscopy with general anaesthesia. Sixty minutes before induction of anaesthesia meperidine 75 mg (Petidin, Kabi, Sweden) was given *im*. At the same time diclofenac sodium 50 mg (Voltaren/Voltarol, Ciba-Geigy, Basle) or placebo was administered *pr* to the patient in a randomized double-blind manner. The ECG monitored continuously. After glycopyrrolate $3 \mu\text{g} \cdot \text{kg}^{-1}$ (Robinul, Robins, UK) anaesthesia was induced with fentanyl, $1 \mu\text{g} \cdot \text{kg}^{-1}$ (Leptanal, Janssen Pharmaceutica, Belgium), followed by thiopentone, 4-5 $\text{mg} \cdot \text{kg}^{-1}$ (Pentothal, Abbot, US). Tracheal intubation

TABLE I Characteristics of patients (mean \pm SD)

	Placebo	Diclofenac
<i>n</i>	22	24
Age(yr)	29.8 \pm 7.9	30.5 \pm 9.6
Weight(kg)	64.1 \pm 7.6	63.8 \pm 11.4
Height(cm)	165 \pm 6.3	166 \pm 24.2

NS placebo vs diclofenac.

TABLE II Characteristics of type of laparoscopy

	Placebo	Diclofenac
Sterilisation (tubal ligation)	6	4
Diagnostic	13	15
Others	3	5

NS placebo vs diclofenac.

was facilitated by succinylcholine, 1 mg \cdot kg⁻¹ (Celocurin-klorid, Kabi, Sweden). Anaesthesia was maintained with N₂O 70% and isoflurane (Forane, Abbot, US) in oxygen. Vecuronium, 0.08 mg \cdot kg⁻¹ (Norcuron, Organon Teknika, The Netherlands), was used for neuromuscular relaxation and at the end of the operation the block was reversed by neostigmine, 40 μ g \cdot kg⁻¹ (Neostigmin, Pharmacia, Sweden) and glycopyrrolate, 10 μ g \cdot kg⁻¹. Neuromuscular monitoring was recorded throughout the operation using a Microstim (Organon Teknika, The Netherlands).

Postoperative pain assessment

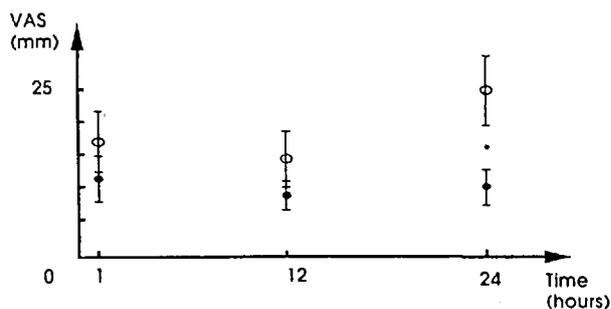
Patients rated their pain on a 100 mm unmarked linear visual analogue scales (VAS)³ where 0 = no pain and 10 = the worst imaginable pain, at 1, 12, and 24 hr after surgery. Pain was assessed and recorded by the nurse in the recovery unit. Analgesics were given on demand and consisted of either meperidine, 25 mg *im* or paracetamol, 500–1000 mg (Alvedon, Astra, Sweden) *po* or *pr*. At 24 hr after surgery, patients were asked by the nurse whether they had had any of the following typical side effects of diclofenac: epigastric pain, nausea, vomiting, diarrhoea, headache, vertigo, exanthema or oedema.

Statistics

Wilcoxon Rank Sum test was used when comparing mean values. Frequencies were tested using the chi-square test. Significance levels of $P < 0.05$ were accepted as significant (two-tailed).

Results

There were no differences in age, weight or height between the groups (Table I). Three patients were excluded

FIGURE Mean (\pm SD) values of pain intensity assessed in patients treated with diclofenac ● or placebo ○. * $P < 0.05$ vs diclofenac.TABLE III Type and amount of post operative analgesic medication (mean \pm SD, % of each group in parentheses)

	Placebo	Diclofenac
Number of patients	15(68)	7(29)*
Meperidine (mg)	38.8 \pm 13.1	33.8 \pm 11.1
Paracetamol (mg)	1400 \pm 831	830 \pm 288

* $P < 0.05$ vs placebo.

TABLE IV Incidence of side effects

	Placebo (<i>n</i>)	Diclofenac (<i>n</i>)
Epigastric pain	2	3
Nausea	4	6
Vomiting	0	2
Headache	6	4
Vertigo	1	4
Patients	9	11

NS placebo vs diclofenac.

because laparotomy was necessary. Among the remaining patients no perioperative complications were recorded. The laparoscopy findings/operations are listed in Table II. After surgery, the pain intensity was greater in the control than in the diclofenac group at 24 hr ($P < 0.05$) (Figure). At 1 and 12 hr the mean pain intensity scores were similar (Figure). During the 24-hr postoperative observation period 15 (68%) of the patients in the control group required additional analgesics (meperidine or paracetamol) compared with seven (29%) in the diclofenac group ($P < 0.05$) (Table III).

Nine (41%) of the patients in the control group and 11 (46%) in the diclofenac group had one or more side effects (NS) (Table IV).

Discussion

In Sweden approximately 15 000 gynaecological laparoscopies are performed annually. Most frequently, the

procedure is performed on a daycare basis despite the problems of post-laparoscopy pain. Postoperative pain is related not only to the subumbilical entry site. Considerable discomfort and particularly shoulder pain may be the result of gas remaining in the peritoneal cavity at the end of the procedure.⁴

Several studies have focused on the problem of nausea and vomiting following laparoscopy^{5,6} which may delay discharge from hospital. The pathogenesis of post-laparoscopy pain and discomfort has not been described until recently.²

Diclofenac is a phenylacetic acid derivate with analgesic, anti-inflammatory and antipyretic properties. Diclofenac was chosen for this study since it has a relatively low frequency of side effects.⁷ Diclofenac has been shown to provide effective pain relief in inflammatory joint disease, renal colic and, more recently, in the control of pain following surgery.⁸⁻¹³

Since post-laparoscopy pain may be due to distention of the peritoneal cavity resulting in peritoneal inflammation,² diclofenac may act not only through its analgesic but also its anti-inflammatory properties. This hypothesis is further supported because only the late pain was affected by diclofenac and that ketorolac (NSAID with less anti-inflammatory properties than diclofenac) failed to reduce post-laparoscopy pain.¹⁴ The data of the present study revealed a reduction in pain 24 hr after laparoscopy in the patients treated with diclofenac compared with the control group. This was found even though the control group received other analgesics more frequently after surgery. Although NSAIDs are responsible for the major part of serious adverse reactions (gastritis, peptic ulcer and depression of renal function) reported to drug authorities^{15,16} the occurrence of side effects recorded in the present study did not differ between the groups of patients.

In conclusion, this study supports the theory that post-laparoscopy pain is, in part, due to peritoneal inflammation. Diclofenac may act through its analgesic but also its anti-inflammatory properties to reduce postoperative pain and the need for other analgesics.

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