COMPARING THE EFFECT OF INTRAMUSCULAR INJECTION OF PETHIDINE AND DICLOFENAC SUPPOSITORY IN RELIEF OF PAIN FOLLOWING LAMINECTOMY SURGERY

M. R. Emamhadi[*1] and H. R. Hatamian[2]

1) Department of Neurosurgery, School of Medicine, Guilan University of Medical Sciences, Guilan, Iran

2) Department of Neurology, School of Medicine, Guilan University of Medical Sciences, Guilan, Iran

Abstract- Pain, particularly after surgery, can create a variety of side effects including delay in wound healing. Different drugs such as pethidine and non-steroidal anti-inflammatory drugs are used for relieving patient's pain after surgery. The purpose of this research was to compare effect of pethidine vs. diclofenac suppository in relief of pain after laminectomy. A total of 100 patients who underwent laminectomy entered this study. They were divided into pethidine and diclofenac groups. The patients' pain score was measured with visual analog scale (VAS) method. The mean pain score 24 hours after surgery was 2.8 ± 2.0 in pethidine group and 4.46 ± 2.30 in diclofenac group. There was a significant statistical difference between pain score after surgery in two groups ($P < 0.05$). Nausea was the most common side effect observed in pethidine group (20%) and epigastric pain was the most common one in diclofenac group (18%). There wasn't any statistical significant difference between side effects in these two groups. It seems that pethidine injection is more effective than diclofenac suppository in relieving pain after laminectomy.

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Key words: Laminectomy, postsurgical pain, diclofenac, pethidine

INTRODUCTION

Pain is an unfavorable experience that occurs following a true or potential tissue injury, including after surgery. Post-operative pain control not only accelerates healing of patient's wounds, but also contributes to the early ambulation and discharge from the hospital. As a result, the costs and time spent for surgery will be reduced (1). A number of studies have shown that 77% of patients undergoing laminectomy experience postoperative pain; therefore, relief of pain that contribute to restoring the function and promoting the quality of life will be of great importance in these patients (2, 3).

To reduce postoperative pain, different drugs including opioids and non-steroidal anti-inflammatory drugs (NSAIDs) have been used. However, the use of opioids is associated with side-effects such as nausea, vomiting, confusion, constipation, tolerance and physical dependency. For this reason, NSAIDs, especially in the form of suppository, have been taken into consideration. Use of suppository is easy, painless and there is no need for injection devices. Also, due to the stimulation of gastrointestinal tract, occurrence of ileus following surgery becomes less likely (4).

Considering contradictory results obtained from studies regarding use of NSAIDs (5, 6), the present

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*** Corresponding Author:**
Mohammad Reza Emamhadi, Department of Neurosurgery, School of Medicine, Guilan University of Medical Sciences, Guilan, Iran
Tel: +98 131 7762061
Fax: +98 131 7762061
Email: emamhadi@ytahoo.com

study was designed and implemented in order to compare the effects of diclofenac suppository and the intramuscular injection of pethidine in reducing the pain following laminectomy.

MATERIALS AND METHODS

In a single blind, randomized controlled clinical trial, the effects of pethidine injection and diclofenac suppository for relieving pain following laminectomy was compared. The studied population consisted of all patients who underwent laminectomy in Poursina Hospital, Rasht, from October to February 2005. The study was approved by Ethics Committee of Guilan University of Medical Sciences and written informed consent was obtained from all subjects.

Inclusion criteria were as follows: 1) age over 20 years, 2) lack of convulsion history, and 3) lack of any prior drug sensitivity to NSAIDs. The criteria for exclusion of individuals from the study were presence of respiratory problems, cyanotic appearance, increased bronchial secretions, addiction to narcotics and history of anorectal disease.

Simple sampling method was used for the individuals and all the patients meeting the inclusion criteria were taken into consideration for inclusion in the study. A total of 104 patients were candidates for surgical operations. Three persons were excluded due to addiction to the narcotics and one due to cardio-respiratory problems. From 100 remaining patients two intervention groups were established by a randomized allocation: diclofenac group (D) and pethidine group (P). Randomized allocation for the interventional groups was performed by selection of numbered cards and card selection was done by the patients in the recovery room. Technicians working in the recovery room had no knowledge concerning the type of treatments listed in the cards.

Intervention was the administration of parenteral pethidine (0.5 mg/kg every 8 hours intramuscularly) and diclofenac suppository (100 mg once per 8 hours).

Pain scores of patients based on Visual Analogue Scale (VAS) were recorded at 4, 12, 20 and 28 hours after surgery. Side-effects of these drugs such as nausea vomiting, headache, dizziness, epigastric pain and respiratory depression were recorded according to the patients' responses.

The one in charge of registering the pain scores and complications had no prior knowledge of the treatment type performed for the patients. Given the type of intervention carried out, the possibility for patients to be blind in connection with the intervention performed was not feasible.

RESULT

Patients participated in the study were 50 males and 50 females. In pethidine group, 23 males (46%) and 27 females (54%) had participated and in diclofenac group, 27 males (54%) and 23 females (46%) were present. Difference in sex distribution of patients in the two groups was statistically significant.

The pain scores of patients during the measured hours are shown in Tables 1 and 2. Fig. 1 shows the pain score trend in the two treatment groups during different hours. Patents in pethidine group had significantly less pain scores in all measured hours. Table 3 shows the relative frequency of the side-effects of the drugs in the two treatment groups.

Table 1. Mean and standard deviation (SD) of pain score in each group according to the measured hour of pain score

Description	Treatment Group	Mean	SD	SE	*t*	*P*
Pain score in 4th Hour	P	5.08	1.47	0.21	-5.052	0.000
	D	6.48	1.30	0.18		
Pain score in 12th Hour	P	3.50	1.42	0.20	-5.052	0.000
	D	5.02	1.61	0.23		
Pain score in 20th Hour	P	2.10	1.05	0.15	-5.353	0.000
	D	3.76	1.92	0.27		
Pain score in 28th Hour	P	0.90	1.18	0.17	-4.714	0.000
	D	2.60	2.26	0.32		

Abbreviations: P, pethidine; D, diclofenac; STD, standard deviation; SE, standard error.

Table 2. Mean, standard deviation and total standard error of the pain scores in P and D groups

Description	Treatment Group	Mean	STD	SE	*t*	*P*
Pain score by hour 4th to 28th	P	2.8950	2.0235	0.1431	-7.238	0.000
	D	4.4650	2.3055	0.1630		0.000

Abbreviations: P, pethidine; D, diclofenac; STD, standard deviation; SE, standard error.

DISCUSSION

Pain is an undesirable experience, and minimizing the pain following the surgery is an important issue (7). In this study, the analgesic effect of diclofenac suppository was compared with the effect of pethidine injection and the results indicate that the analgesic effect of pethidine is greater than diclofenac through all 24 hours.

In a study by Ng *et al.* the sedative effects of morphine, diclofenac suppository and placebo were compared following the hysterectomy (8) and it was concluded that the reduction of pain in the groups receiving active drugs was more significant compared to the group receiving the placebo. Also, it was concluded that the use of diclofenac suppository can reduce the consumption of morphine and general anesthesia side effects following the operation. Though this study indirectly indicated the analgesic effects of diclofenac suppository, considering the fact that both analgesic drugs have been used together and the patients, too, had surgeries on their soft tissues, results of this study can not be compared with results of our study.

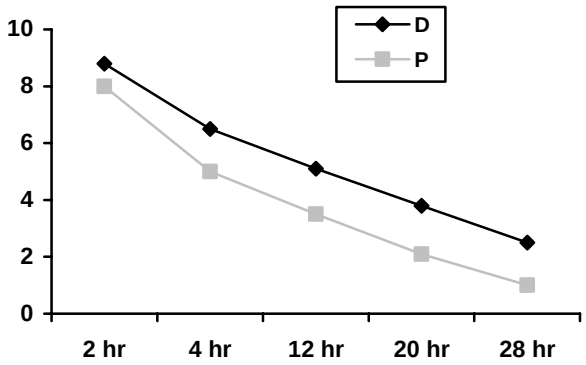

Fig. 1. Pain score trend during the measured hours. D, diclofenac; P, pethidine.

In a study performed in Iran, analgesic effects of pethidine were compared with diclofenac suppository following inguinal hernia surgery (5), and no statistically significant difference was found during first 24 hours following the surgery (mean and SD of pain score in pethidine group and diclofenac group were reported 3.1 ± 0.9 and 2.4 ± 0.9, respectively). The difference of this study with ours was in the type of surgical operation, *i.e.* soft tissue versus hard tissue, considering pain after laminectomy is mainly due to bone injury. Also, it should be noted that in the above-mentioned study, age group of the patients were not specified and it is obvious that pain experience in various age groups is different.

In another study concerning the analgesic effects of a 100 mg dose of diclofenac suppository, it was found that administration of diclofenac was effective in reduction of the required dosage of local epidural anesthesia up to 33% during 24 hours after Cesarean section compared to the control group without diclofenac (4). This research indirectly indicate the analgesic effect of diclofenac but since surgical operations were performed on the soft tissues and were associated with the local anesthesia, considering of method and the type of patients, the study was different from our study.

In conclusion, results of our study indicate that there is a statistically significant difference between the analgesic effects of intramuscular injection of pethidine and diclofenac suppository on the pain following the laminectomy, with pethidine being more effective than the diclofenac suppository.

Conflict of interests

The authors declare that they have no competing interests.

Table 3. Relative frequency of drug side effects in both groups of P and D*

Side effects	Number of complications in treatment groups		(X^2)	*P*
	Group P	Group D		
Nausea	10.50	4.50	2.96	0.085
Headache	6.50	3.50	1.09	0.29
Epigastric pain	4.50	9.50	2.19	0.14
Vomiting	3.50	0	3.06	F1=0.12, F2=0.24
Total	23.50	16.50	2.04	0.15

Abbreviations: P, pethidine; D, diclofenac.
*Data are given as percent.

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