EFFECTIVENESS OF WOUND INFILTRATION WITH LOCAL ANESTHETIC AGENT AFTER ABDOMINAL SURGERY

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ABSTRACT

Objective: *To assess the effectiveness of local infiltration of wound with 20 ml of 0.5% bupivicain after abdominal surgery in term of delay in postoperative analgesic demand.*

Material and Methods: *This case control study was carried out at the Surgical Unit of City Hospital, Kohat Road Peshawar from January 2004 to January 2005. Two hundred patients, who underwent abdominal surgery selected by non-probability convenient sampling, were randomized by odd or even numbering into two equal groups: Group1 (the study group) and Group 2 (the control group). In group 1 patients (n=100) the wound and surrounding tissues were infiltrated with 20 ml of 0.5% bupivicain and in Group 2 patients (n-100) the wound was not infiltrated. Post-operative pain was assessed with visual analogue scale (VAS).*

Results: *Patients in Group 1 were more comfortable during the postoperative period and average delay in analgesic demand was 5.1± 0.8 hour as compared to a 2.4± 1.1 hour in group-2. Eight (8%) patients in the group 1 required no supplementary analgesia at all. Patients in study group-1 were mobilized much earlier (8.8 ± 1.2 hours) as compared to control group-2 (18.1 ± 1.5 hours). There was no significant difference in the incidence of wound related complications between the two groups. Mean hospital stay in group-1 was 51.20 ± 2.5 hours as compared to 73.20 ± 3.7 hours in group-2.*

Conclusion: *Wound infiltration with bupivacain is an effective method of minimizing postoperative pain.*

Keywords: *Abdominal Surgical Wound, Local Bupivacain Infiltration, Post Operative pain.*

INTRODUCTION

Pain causes increase in the sympathetic response of body with subsequent rise in heart rate, cardiac work and oxygen consumption. Prolong pain can reduce physical activity and leads to venous stasis and an increase risk of deep vein thrombosis and subsequent pulmonary embolism. In addition there can be wide spread effects on gut and urinary tract motility which may lead to post operative ileus, nausea, vomiting and urinary retention. These problems are unpleasant for the patients and may result in prolong hospital stay. [1] Patients show variable threshold for pain, however, 75% of surgical patients have severe postoperative incisional pain. [2] Pain relief may cause good psychological and physical effects in patients, which could lead to better recovery from surgical procedures and early mobilization of patients to prevent complications like deep vein thrombosis etc. [3]

According to Taylor MS [4], wound infiltration with long acting local anesthetic agents are considerably less expensive and free of complications when compared to systemic analgesia. Coleman A [5] also suggested that the systemic analgesia could alleviate pain while local techniques can eliminate it. The efficacy of local infiltration of wounds in various operations has been reported by various workers. [6-9]

The purpose of this study was to assess the effectiveness of local infiltration of wound with 20 ml of 0.5% bupivicain after abdominal surgery in term of delay in postoperative analgesic demand.

MATERIAL AND METHODS

This case control study was carried out at the Surgical Unit of City Hospital, Kohat Road Peshawar from January 2004 to January 2005. Two hundred patients were operated for intra-abdominal

VARIOUS OPERATIONS CARRIED OUT ON PATIENTS

Operations	Group-1 (n= 100)	Group-2 (n= 100)
Cholecystectomy	7	7
Laparotomy	6	6
Appendicectomy	25	21
Inguinal Herniorraphy	40	44
Haemorrhoidectomy	22	22

Table 1

conditions during this period. Patients were divided into two groups, Group1 (The study group) and Group 2 (The control group). For both the group selection of the patient was by non-probability convenient sampling; all patients were randomized to either group by odd or even numbering accordingly. No consideration was given to age, sex or provisional diagnosis for inclusion of any patient to any group. Patients having the dementia, cardiovascular diseases and diabetes mellitus were excluded from this study. In group-1 patients, the wound and the surrounding tissues were infiltrated with 20 ml of 0.5% bupivacain, diluted with equal amounts of normal saline (thus reducing the concentration to 0.25%) before applying skin stitches. All these patients were informed about the procedure and consent was obtained. A proforma was designed for the study and used for collection of data in both the groups. Assessment of pain was based on visual analogue scale. [10] This is a 10 cm long paper strip, marked no pain at one end and worst possible pain on the other, and the patient is asked to mark an X on the strip according to intensity of pain he is experiencing, The patients were advised to ask for analgesics whenever they feel like, complaint of pain was scrutinized to evaluate whether the pain was from the incision or from some other reason. Only the incisional pain was considered for relief. Requirement of analgesics after surgery was monitored in both the groups. The analgesic used in all cases was injectable diclofenac sodium, which inhibits prostaglandin synthesis, thus influencing peripheral sensitization. [7] Time of administration of first analgesic dose was noted in all the cases to calculate the time interval between termination of surgery and onset of pain, in order to asses the delay caused by the effects of local anaesthetic in the study group.

Statistical data analysis including mean, frequency, standard deviation, student t-test and chi-square-test, was performed on the statistical package for Social Sciences (SPSS 10).

RESULTS

Two hundred patients were included in the study who were operated for different abdominal conditions (Table 1). Age and sex distribution among both the groups were almost similar for the comparison (Table 2). Patients in Group 1 were more comfortable during the postoperative period and average delay in analgesic demand was 5.1± 0.8 hour as compared to a 2.4± 1.1 hour in group-2 (Table 3), indicating significant difference ($p < 0.05$) between the two groups. Eight (8%) patients in the group 1 required no supplementary analgesia at all. Patients in study group-1 were mobilized much earlier (8.8 ± 1.2 hours) as compared to control group-2 (18.1 ± 1.5 hours) (seeTable 4). There was no significant difference in the incidence of wound related complications between the two groups (Table 5). Mean hospital stay in group-1 was 51.20 ± 2.5 hours as compared to

DISTRIBUTION OF AGE AND SEX

Grouping	Group-1	Group-2	P-value
Male	68	65	
Female	32	35	
Minimum	13 years	15 years	
Maximum	70 years	68 years	
Mean age ± SD	41.5 years ± 3.1	41.5 years ± 3.3	0.11

Table 2

DELAY IN ANALGESIC DEMAND IN HOURS IN PATIENTS

Delay in hours	Group-1	Group-2	P-value
Minimum	2.6	0.4	
Maximum	20.0	22.0	
Mean ± SD	5.1 ± 0.8	2.4 ± 1.1	0.0001

Table 3

MOBILIZATION TIME IN HOURS OF PATIENTS

Mobilization time in hours	Group-1	Group-2	P-value
Minimum	4.2	7.8	
Maximum	48	63	
Mean ± SD	8.8 ± 1.2	18.1 ± 1.5	0.000028

Table 4

COMPLICATIONS IN PATIENTS AFTER OPERATION

Complications	Group-1 (n= 100)	Group-2 (n= 100)
Fever	10 (10%)	8 (8%)
Chest infection	1 (1%)	3 (3%)
Wound infection	6 (6%)	9 (9%)
DVT	----	1 (1%)

Table 5

73.20 ± 3.7 hours in group-2 (Table 6).

DISCUSSION

With the advancement in surgical techniques, there have also been new developments in post-operative pain care. One of these is infiltration of wounds at the time of closure, with a long acting local anesthetic agents. Wound infiltration has been demonstrated to have an analgesic sparing effect and has the major influence on the patients ability to resume there normal activities of daily living.[11,12] We, in our study, used bupivacaine, which is an amide derivative of cocaine, that was the first compound to exhibit local anesthetic effect.[13] It is related chemically and pharmacologically to the aminoacylgroup of local anesthetics. These drugs block the generation and effect the conduction of nerve impulses, presumably by increasing the threshold for electrical excitation in the nerve, by slowing the propagation of the nerve impulses and by reducing the rate of size of the action potential. These actions are mediated by reducing the permeability of sodium ions across the cell membrane. According to Peng PWH et al [14], local infiltration of wounds does not prevent inflammatory response of clean surgery, so it has been widely employed in combination with general anaesthesia to control post operative pain. It significantly reduces the pain score and analgesic requirements in the immediate post operative period.[8] Pavlin DJ et al[15] have confirmed the importance of using local anesthetic for controlling post operative pain. In a large series using bupivacaine infiltration after appendicectomy, 23% patients needed no postoperative analgesia while 71% required only simple analgesics like paracetamol.[3] In another study, the average dose of analgesic required was 87 mg of diclofenic sodium per patient in first 24 hours in patients with bupivacaine infiltration, compared with 158 mg per patient for those without any infiltration.[7] Their finding matches with our report where average dose of analgesic (injection diclofenac sodium) was 85 mg per patient in the study group compared to 155 mg per patient in control group.

After major abdominal surgery, the demand of supplementary post operative analgesia was also delayed in group 1. The results show that the patients with wound infiltration were more comfortable during immediate postoperative period. They were mobilized much earlier compared those on parenteral analgesia alone. Cobby TF et al [11] reported that patients who had undergone caesarean section were sufficiently pain free to breast feed their babies. This shows early return to normal activities, which is a beneficial effect and was also reflected in the present series. This suggests that bupivacain infiltration is simple, safe and effective method of alleviating post operative pain and is especially appropriate for the day case surgery.[3,14] It has been observed during the present study and in another study by Iqbal J [7] et al from Pakistan, found an average pain relief of 4-5 hours is beneficial in early post-operative treatment. Due to the limited number of patients, a significant difference in the incidence of pain related post-operative complications could not be established, however, the delay in the analgesic demand and early mobilization of patients clearly recommend the application of this procedure in routine surgical procedures.

CONCLUSION

In present study we conclude that wound

AVERAGE STAY IN HOURS OF PATIENTS IN HOSPITAL

Procedure	Average stay in hours	
	Group-1 (n= 100)	Group-2 (n= 100)
Inguinal herniorrhaphy	24	47
appendicectomy	36	56
Cholecystectomy	78	96
Laparotomy	94	133
Haemorroidectomy	24	34
Mean ± SD	51.20 ± 2.5	73.20 ± 3.7

Table 6

infiltration with bipavacain is effective method of minimizing postoperative pain.

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