An Assessment of Buprenorphine as an Analgesic

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Abstract

Buprenorphine has been shown to be an effective analgesic agent. In this trial buprenorphine was found as an effective analgesic agent in most of surgical emergencies; same was true for post operative cases. The duration of analgesia in this study was found to be nearly 8 hours as compared with morphine which was 5-1/2 hours. In another study after operations (Royll and Versichelas, 1976) the duration of analgesia following 4 ug/kg of buprenorphine was at least 6 hours. The drug has a low frequency of side effects. Respiratory depression is known to occur with buprenorphine. In a study of Orwin and Robson (1976) the respiratory effects of equianalgesic doses of buprenorphine and morphine were similar (JPMA 31:250, 1981).

Introduction

Buprenorphine is a new synthetic analgesic agent derived from thebaine (Lewis, 1974) and is closely related in structure to morphine. Boura and Fitzgerald (1966) found buprenorphine to be 50 times more potent compared with morphine in mice, rat and dog. Clinical trials in man (Hovell, 1976) showed that buprenorphine is safe, potent and long acting analgesic which was equally useful in the treatment of pain after surgery.

Prolonged administration in monkeys and mice does not produce addiction. Peak concentrations in man are found 10-30 minutes after M injection. Excretion of buprenorphine is relatively slow and the principal route is faeces. It is mata-bolised in the liver but mostly unchanged buprenorphine is found in the faeces.

Object of the Trial

The object of the trial was to assess:

1. The efficacy of buprenorphine as an analgesic in all sorts of general surgical emergencies.
2. A comparative study of buprenorphine with morphine as analgesic in post operative patients. In the latter group buprenorphine and morphine were compared for the duration of pain relief in the post operative period and adverse reactions if any of both the drugs were noted.

Methods and Material

A total number of 150 patients were admitted to this trial. The cases were divided in two groups.

1 General assessment group consisted of fifty non-operative random patients who reported to the casualty department with acute illness, trauma and colics to assess the analgesic activitiy of buprenorphine.

2. In the comparative group (fifty pairs) one hundred of post operative patients were studied for comparison between buprenor-phine and morphine. All the patients were selected from the North Surgical Ward, Mayo Hospital, Lahore. The age difference between the pairs was not more than five years, and they belonged to the same sex. Similar operations were performed by the same group of surgeons. The anaesthesia techniques and procedures were also similarly standardised.

All patients who were mentally somewhat unstable or considered to be malingerers were excluded from the trial. The age varied between 12 and 72 years (Table 1).

Table

Age Groups

General Assessment group		Comparative group	
		Buprenorphine	Morphine
12-20	9	7	7
21-30	11	13	13
31-40	16	18	18
41-50	6	4	4
51-60	4	6	6
61-70	3	2	2
71-and above	1	—	—
Total	50	50	50

Fifty of the post-operative cases received buprenorphine 0.3 mg IM and the comparative group of fifty patients received 10 mg. morphine 1/2 an hour after anaesthesia. Non-operative cases received in the emergency room buprenorphine as a primary analgesic. The sex ratio is given in table 2.

Table II Sex Ratio

General Assessment group		*Comparative group*	
		Buprenorphine	*Morphine*
Male	37	32	32
Female	13	18	18
Total	50	50	50

Table III-A Emergency Cases

General Assessment group		*No. of Patients*
	Diagnosis	
1.	Colics:	
	Renal	15
	Biliary	7
2.	Multiple Injuries and Fractures	19
3.	Advance Malignancy	3
4.	Burns	5
5.	Epididymoorchitis	1
	Total	50

Table 3A shows the general breakdown of random patients received in the emergency who were given buprenorphine as a primary analgesic

Table III-B Comparative Groups (Non, Emergency Cases)

Operations	*No. of pairs*
1. Herniorrhaphies	25 (50 patients)
2. Appendicectomies	13 (26 patients)
3. I/m nailing femur	4 (8 patients)
4. Fistulectomies	2 (4 patients)
5. Bilateral Oophorectomy	2 (4 patients)
6. Ligation and excision of varicocele	2 (4 patients)
7. Pyelolithotomy	1 (2 patients)
Total	50 (100 patients)

Table 3B shows the breakdown data of the post operative cases selected for the comparative study of buprenorphine versus morphine for their analgesic effect.
The above patients were monitored carefully for a period of 10 hours post-operatively observing the following protocol by the senior and junior Registrar and competent senior Nursing Staff:
1. Hourly pulse
2. Hourly blood pressure
3. Onset of analgesic effect
4. Recurrence of pain after first injection.

Onset of analgesic effect in various patients in the general assessment groups is given in .
For the duration of relief from pain their state of comfort and state of analgesia were carefully observed by the Nursing Staff on duty The observation was stopped at the end of 10th hour or earlier if a second injection had to be given. The mean of the duration was taken as pain-free period. The response was comparatively studied applying the following:
A Good B Satisfactory
C Poor
Good response meant that the patient was completely pain free; satisfactory response meant a relative freedom from pain whereas poor response denoted poor relief of pain or imperfect analgesia.

Table VI

Side Effects

Reaction	*Buprenorphine*		*Morphine*	
1. Vomiting	6	12%	7	14%
2. Rigors	2	4%	1	2%
3. Resp. difficulty	2	4%	1	2%
4. Generalised Rash	1	2%	3	6%
5. Potentiation of therapeutic effect of anaesthetic agents (Halothane Flexedil and Brevedil)	1	2%	1	2%
6. Hyperpyrexia	1	2%	Nil	Nil
7. Blurring of vision	Nil	Nil	2	4%
Total	13		15	

The results are shown in Table 5 and Fig. 2.

Fig. 1.

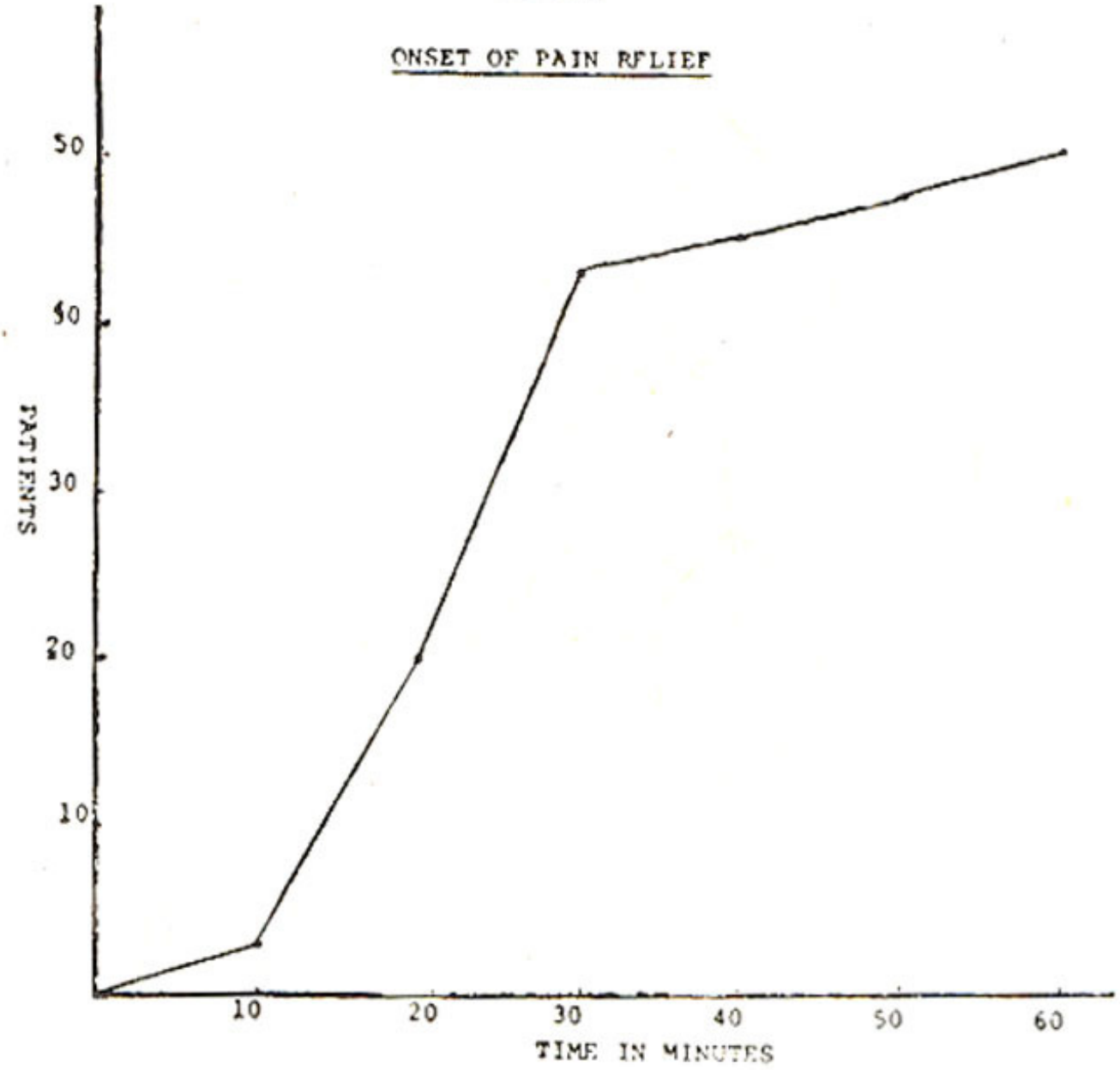
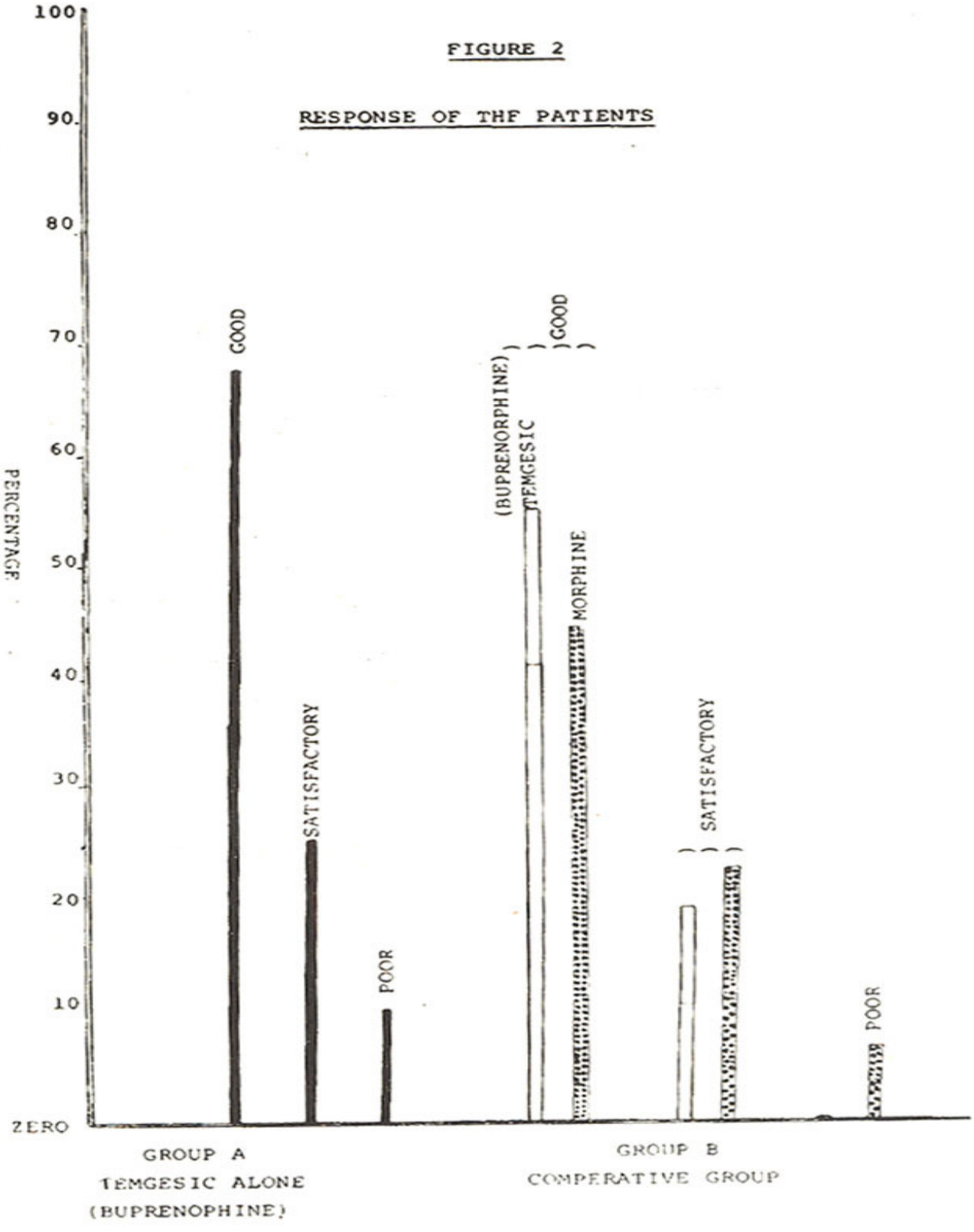
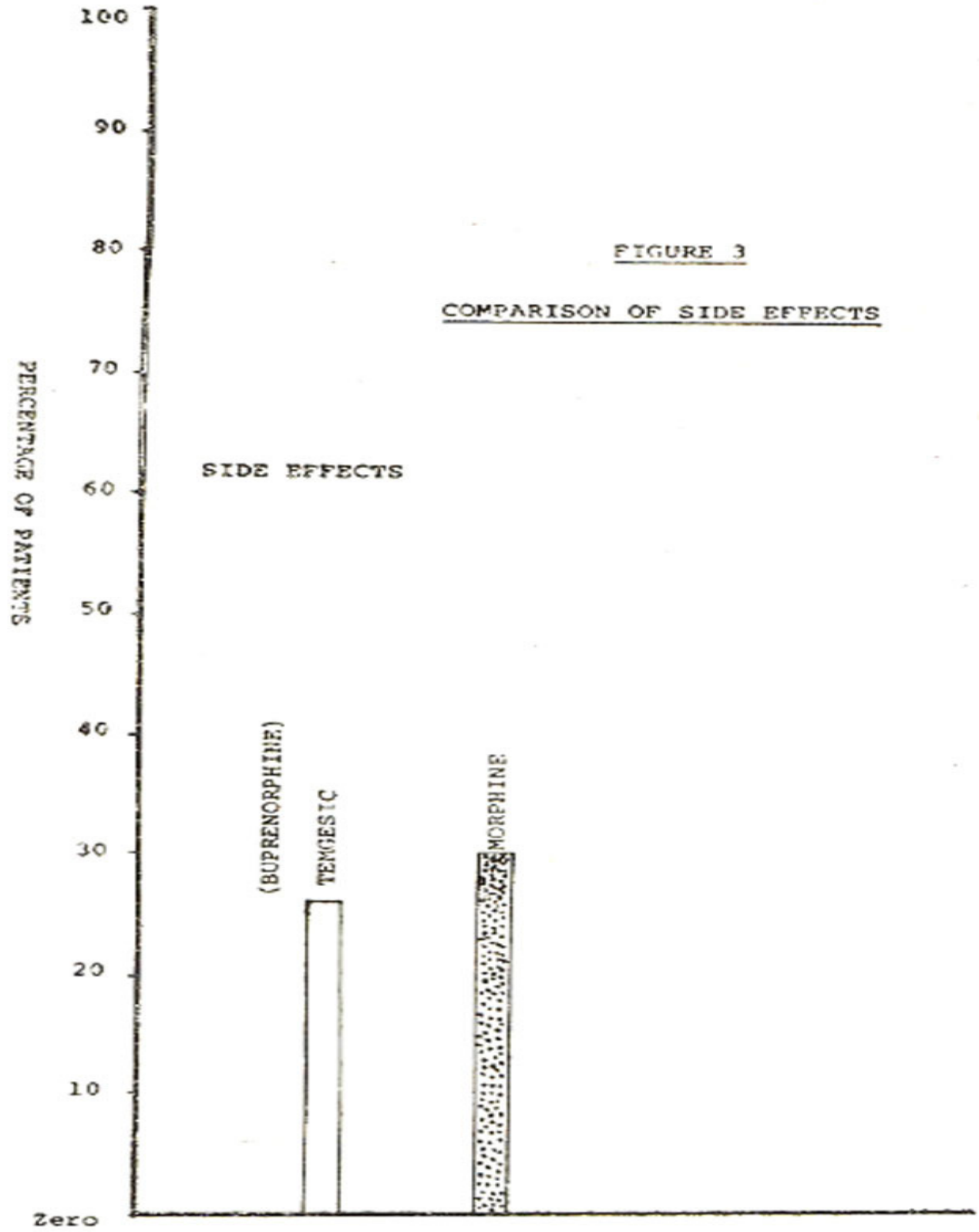


FIG. 1
ONSET OF PAIN RELIEF
50
40
30
20
10
PATIENTS
10
20
30
40
50
60
TIME IN MINUTES

FIGURE 2

RESPONSE OF THF PATIENTS





The untoward side effects were recorded.

Table IV

Therapeutic Response

General Assessment Group			Comparative Group Buprenorphine		Morphine	
Good	35 patients	74%	40 patients	80%	33	66%
Satisfactory	12 ,,	24%	10 ,,	20%	13	26%
Poor	3 ,,	6%	Nil		4	8%
Total	50		50		50	

Table 6 illustrates a list of complications along-with number of patients and their percentage who received 0.3 mg. Buprenorphine compared with the group receiving 10 mg of morphine.
No deaths were recorded during the trial. A total of 26% of patients receiving buprenorphine showed side effects while 30% patients who were given morphine showed the same. Out of 13 patients receiving buprenorphine who showed untoward effects, 7 patients needed treatment. Out of 15 patients who showed adverse reactions to morphine 8 patients needed treatment.
In our study respiratory depression was found to be potentiated by anaesthetic agents like Halo-thene Brevedil and Flexedil. This calls for a care in its use in conjunctioc with anaestheric agents.
Whereas we recommend buprenorphine as a safe and effective analgesic in acute pain and as post operative analgesic; its use as an adjunct to anaesthetic agents is not recommended.

Acknowledgement

The authors are grateful for the help and assistance of Dr. Tanveer A. Naveed Bhatti, Registrar, N.S.W., Dr. S.N.H Kazmi, M.O., Dr. Modood Ali, Senior House Surgeon, N.S.W., Dr. S. Athar Ali Bokhari, Senior House Surgeon, N.S.W., and staff Nurse Nusrat Saeeda and Staff Nurse Zaib-un-Nisa. Thanks are also due to Messrs Abdul Ghaffar Naeem and Muhammad Aslam Javed of Postgraduate Medical Institute, Lahore.

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