Single Dose Intrathecal Tramadol in the Management of Postappendicectomy Pain

S. Parthasarathy, M. Ravishankar

ABSTRACT

Fifty patients of either sex belongings to ASA I or II, scheduled for elective appendicectomy were selected for the study. They were divided randomly into two groups and were assigned to receive either subarachanoid hyperbaric lignocaine 5% with 10 mg of tramadol (group T) or only subarachanoid hyperbaric lignocaine 5% (group C). Pain scores (numeric rating score 0-10) and sedation scoring was done for 12 hours in the postoperative period by a blinded observer Inj. Pentazocine 30 mg. IM was given as a postoperative analgesic on demand or when NRS score was >5.

Time to first analgesic (TFAAA) was significantly longer (mean ± SD, 310 ± 127.49 min Vs 131 ± 40.51, p<0.01) and the pentazocine requirements were significantly less (p<0.05) in the tramadol group. The pain and sedation scores were comparable and there were no significant side effects. Single dose intrathecal tramadol (10mg) can be effectively used for relief of postoperative pain in the initial 12 hours.

KEY WORDS: **Analgesia** : Postoperative
Techniques : Intrathecal opioids
Drugs : Tramadol

The remarkable efficacy provided by intrathecal and epidural administration of opioids has clearly improved the management of post operative pain. The early experience with large doses of morphine produced a protracted duration of analgesia but reports of delayed emergence, respiratory depression, nausea, pruritus dampened the enthusiasm of using spinal opioids[1,2]. Careful dosage adjustments and vigilant monitoring is indicated while using morphine. Tramadol[3,4,5] an opioid agonist-antagonist is known to provide adequate analgesia with less respiratory depression. Animal studies have confirmed the analgesic effect of intrathecally administered tramadol[6] but human studies establishing its efficacy are lacking. Hence we studied the effect of low dose tramadol in a mixture of local anaesthetic administered intrathecally as a single dose in providing postoperative pain relief.

MATERIAL AND METHODS

The study population consisted of fifty patients in the age group of 18 to 48 years belonging to physical status ASA I or II admitted to Government District Headquarters hospital, Kumbakonam for interval appendicectomy. The study was initiated after obtaining the approval from the hospital, ethical committee. Patients with fever or a history of respiratory illness were excluded from the study. An informed consent was obtained. They were explained about the Numerical Rating Scale (NRS) of pain and were asked to rate their intensity on a scale of 0-10, with 0 as no pain and 10 as the maximum possible pain. The patients were premedicated with Inj. Pentazocine 30 mg and Inj. Atropine 0.6 mg I.M. 30 minutes before surgery. With patients in right lateral position, spinal anaesthesia was administered in L3-L4 interspace. Patients were randomly allocated using sealed envelope technique to

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receive either 1.8 ml of lignocaine 5% (group C) or 1.8 ml. of lignocaine 5% with 10 mg. of preservative free tramadol (group T). The patient and the observer were blinded to the drug administered intrathecally. Patients with inadequate block who required general anaesthesia or additional intraoperative sedatives were excluded from the study. All patients were monitored till the subarachnoid block wore off before transferring to the ward. In the postoperative period pulse, blood pressure and respiratory rate were monitored every half hour. The pain was assessed using the NRS and sedation-score using a 3 point scale : (i) Asleep & comfortable, (ii) awake & comfortable (iii) awake with pain.

The observer who was blinded to the drug administered to the patient, did the recording every 30 minutes for first 3 hours and then, every 3 hours for next 9 hours. Inj. Pentazocine 30 mg. IM was administered any time patient demanded pain relief or when the NRS exceeded[5]. The time of first request for analgesia was noted.

The data were collected upto 12 hours and statistical analysis was done by students 't' test p value of less than 0.05 was considered significant.

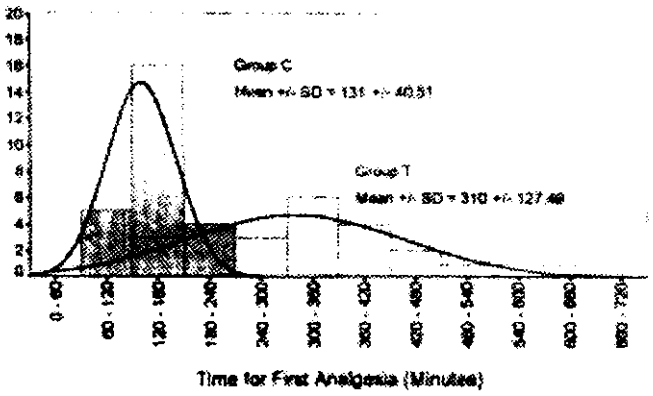
Table 1.

Sedation Score

Parameter	Score
Asleep and comfortable	1
Awake and comfortable	2
Awake with pain	3

RESULTS

Both the groups were comparable regarding demographic variables such as age, sex, weight and duration of surgery (Table 2). No patient required general anaesthesia or additional sedatives/narcotics due to inadequate block and the intraoperative period was uneventful in all the fifty cases. The appendicectomy performed was completed within 30 minutes in all patients. In the postoperative period the mean time for first analgesia (TFA) was significantly prolonged in group T. (Mean ± SD 310 ± 127.49 Vs 131 ± 40.51 minutes, p<0.01) (Fig.1). The mean pentazocine



Group C ▒ *Group T* □ **p<0.01*

Figure 1. *Histogram with normal curve for TFA in 2 groups*

requirements were significantly less in group T (46.8 ± 15.1mg) than group C (63.6 ± 19.1mg) (p<0.05). Cumulative pentazocine requirement showed a steep rise at 2 hours in group C and remained higher throughout the study period (Fig.2)

Table 2.

Comparison of Demographic data

Parameter	Group T	Group C
Age (years)	25.16±6.9	24.44±5.27
Weight (kg)	52.12±5.57	50.0±5.4
Sex (F:M)	8 : 17	7 : 18
Duration of surgery (min)	20.12±3.4	21.1±3.2

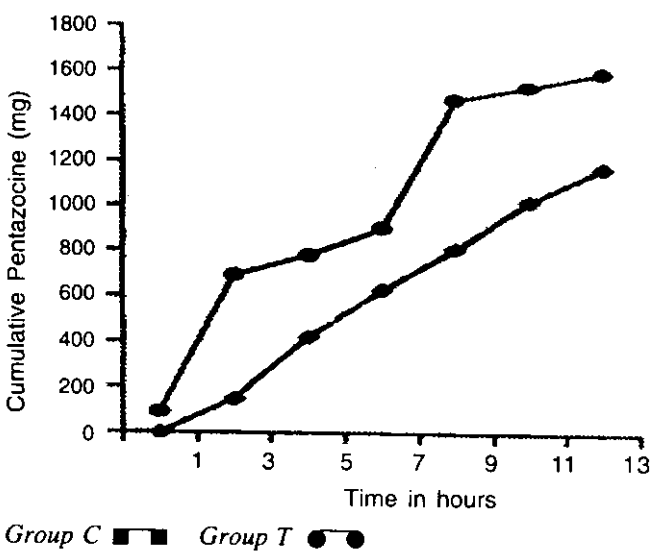


Figure 2. *Cumulative pentazocine requirement in 2 groups.*

Patients of group T were more sedated at 0 and 6 hours while patients of group C were more sedated at 3 and 9 hours. The sedation scores were similar at 12 hours. The NRS scores for pain were comparable in both groups and the mean value was below 5 at all times. The respiratory rate was between 15 and 25 per minute in the first 12 hours in all the fifty cases. Only one patient had vomiting and one had urinary retention in group T. No other side effects were observed.

DISCUSSION

The nature of pain is multi dimensional and exhibits individual variations. Every technique or agent used to provide pain relief has its own advantages and disadvantages, and to designate any technique or agent as ideal is very difficult. Intrathecally administered opioids along with local anaesthetics, with its advantages of simplicity and reliability have come to the fore. Various studies have shown the usefulness of addition of a low dose of opioid with the local anaesthetic for subarachnoid block. Combined administration of intrathecal local anaesthetic and morphine is the most commonly used technique with satisfactory results[7,8]. Fentanyl in small intrathecal doses (6.25 μgm) has been shown to improve the quality of intraoperative analgesia and also provided 3 hours of postoperative analgesia[9]. Sufentanil[10] by intrathecal route (10 μgm) in combination with hyperbaric bupivacaine has also shown similar postoperative analgesic effects as fentanyl. Studies have shown the usefulness of epidural tramadol[11]. Delilkan et al.[12] concluded that 100 mg of epidural tramadol gives better analgesia than either 50 mg of epidural tramadol or 10 ml of 0.25% bupivacaine. They showed that respiratory depression is not significant with 100 mg of epidural tramadol.

In this study, we had chosen the postappendicectomy patients as they formed a good experimental model for study of somatic pain. The intensity of pain is likely to be similar in all the patients with minimal visceral component. We evaluated the efficacy of low dose intrathecal tramadol as postoperative analgesic. We did not encounter any major intraoperative problem. In the postoperative period, the time for first analgesic was significantly prolonged in group T (310 minutes) while it was 131 minutes in group C. The total requirement of pentazocine was also significantly less in group T. These two factors clearly establish the analgesic efficacy of low dose intrathecal tramadol. It would have been ideal to use patient controlled analgesia to assess the narcotic requirement postoperatively. In a peripheral hospital such facilities are not available and hence we resorted to on demand analgesia as bolus dose provided by the staff nurse. Even though the sedation and pain scores were similar, the relative differences can be attributed to the timing of analgesic injection, as the majority of group C patients received the first dose within 2 hours while majority of group T patients received between 3 and 6 hours of the study. Very deep sedation or lowering of respiratory rate below 14/minute was not found in any of the fifty cases. The potential advantage of tramadol is its action through different receptors. The opioid component of tramadol-induced antinociception is mediated by the mu-opioid receptor. The opioid component of tramadol-induced antinociception is mediated by the mu-opioid receptor. Further examination of the neurochemical profile of tramadol revealed that unlike morphine, it also inhibited the uptake of norepinephrine and serotonin. This favours a nonopioid component in the tramadol induced antinociception. This multimodal action may be responsible for its decreased depressant effect on respiration[13,14]. This effect prompted us to use tramadol as a single dose intrathecal analgesic to utilize its efficacy and to overcome the most dreaded respiratory depression in using subarachnoid opioids. The added advantage is its easy marked availability because of its low addiction potential. This factor counts in pain management strategies in the face of frequent non-availability of potent narcotics in most developing countries, including India. At the peripheral hospital we did not resort to continuous oximetry in our study, as our trial cases in the institute with 10 mg. of intrathecal tramadol did not show any desaturation for 24 hours. Hence, we conclude that single dose intrathecal tramadol is a useful tool to overcome postoperative pain especially in the initial stages, without many side effects. Its safer side effect profile and the lesser necessity for monitoring equipments makes it a choice opioid for spinal use in peripheral setup.

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