Original article:

Evaluation of Postoperative Pain After Craniotomy: An Institutional Based Study

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Date of Submission: 07 March 2013, Date of Acceptance: 29 April 2013

ABSTRACT

Background: The present study was conducted for assessing postoperative pain after craniotomy.

Materials & Methods: The present study was conducted in the Department of Neurosurgery, Government Medical College, Amritsar, Punjab (India) for assessing postoperative pain after craniotomy. A total of 20 patients scheduled to undergo craniotomy were enrolled. Complete demographic and clinical details of all the patients was obtained. Intensity of pain was evaluated 1, 4, and 24 hours after extubation using a VAS (Visual analogue scale) ranging from 0 (no pain) to 10 (maximal pain). Routine perioperative pain management was not influenced by the investigators. All craniotomies were performed under general anesthesia without local anesthetic infiltration of scalp. Anesthesia was induced with the opioids and with the hypnotic agents propofol or etomidate. Intubation was facilitated with muscle relaxants atracurium or succinylcholine.

Results: 80 percent of the patients were males. During the initial 24 hours, 90 percent of the patients experienced pain. Among these 18 patients, pain score was between 1 to 3 in 5 patients while it was between 4 to 6 in 6 patients. In the remaining 7 patients, the pain score was more than 6. In order for maintaining postoperative analgesia, the opioid piritramide was given in 11 patients out of 18 patients while nonopiod analgesics to 13 patients.

Conclusion: Pain is experienced by the majority of patients after craniotomy; hence; the is a need of improving pain management among these patients.

Key words: Craniotomy, Pain, Postoperative.

INTRODUCTION

Fear of the side effects of analgesic drugs frequently leads to the under-treatment of post-craniotomy pain. Nevertheless, this pain continues to be commonly observed, is frequently severe, and, if unrelieved, may cause distress for the neurosurgical patient and serious complications for the operative brain. Opioids, such as morphine or oxycodone, may be used in the early period after craniotomy. If titrated properly, opioids do not increase serious side effects as compared with codeine. The non-narcotics ketoprofen, tramadol, and paracetamol may be useful as supplemental, opioid-sparing drugs.[1- 3]

Current studies suggest acute and chronic pain is common in patients after craniotomy. Surgical and patient factors may influence the incidence and severity of pain and a multimodal approach to acute postcraniotomy pain is recommended. Although codeine and tramadol are frequently used in the postoperative period, research suggests morphine provides superior efficacy with a good safety profile. Local anesthesia with nerve blocks has

not been shown to consistently reduce acute postoperative pain, though it has recently been demonstrated to dramatically reduce the incidence of chronic pain. Despite this, little is known about the mechanisms, prevention and treatment of chronic postcraniotomy pain.[4- 6] Hence; the present study was conducted for assessing postoperative pain after craniotomy.

MATERIALS & METHODS

The present study was conducted in the Department of Neurosurgery, Government Medical College, Amritsar, Punjab (India) for assessing postoperative pain after craniotomy. A total of 20 patients scheduled to undergo craniotomy were enrolled. Complete demographic and clinical details of all the patients was obtained.

Intensity of pain was evaluated 1, 4, and 24 hours after extubation using a VAS (Visual analogue scale) ranging from 0 (no pain) to 10 (maximal pain). Routine perioperative pain management was not influenced by the investigators. All craniotomies were performed under general anesthesia without local anesthetic infiltration of scalp. Anesthesia was induced with the opioids and with the hypnotic agents propofol or etomidate. Intubation was facilitated with muscle relaxants atracurium or succinylcholine. Anesthesia was maintained with sevoflurane inspired or propofol infusion. Assessment of all the results was done using SPSS software.

Table 1: Demographic variables

Demographic variables	Number	Percentage
Males	16	80
Females	4	20
Mean age (years)	43.8	
Mean BMI (Kg/m^2)	26.1	

Table 2: Pain after 24 hours

Pain after 24 hours as per VAS	Number	Percentage
0	2	10
1 to 3	5	25
4 to 6	6	30
7 to 10	7	35

Table 3: Pain management

Pain management	Number	Percentage
Opioid piritramide	11	55
Non-opioids	13	65

RESULTS

A total of 20 patients were evaluated. Mean age of the patients was 43.8 years. Out of 20 patients, 80 percent of the patients were males. During the initial 24 hours, 90 percent of the patients experienced pain. Among these 18 patients, pain score was between 1 to 3 in 5 patients while it was between 4 to 6 in 6 patients. In the remaining 7 patients, the pain score was more than 6. In order for maintaining postoperative analgesia, the opioid piritramide was given in 11 patients out of 18 patients while nonopiod analgesics to 13 patients.

DISCUSSION

Pain following craniotomy is common and has recently received increased attention in the literature. Up to 80% of patients experience severe pain in the acute postoperative period and up to 50% continue to experience chronic headache months after their surgery. Recent surveys and expert opinion emphasize that postcraniotomy pain continues to be poorly managed and undertreated. A presumed lack of need and concern that opioids may preclude neurological evaluation and cause neurological deterioration remain obstacles to treatment. Neurosurgical patients may not volunteer complaints even when pain is severe and experienced nurses and clinicians often underestimate its severity. Nevertheless, effective analgesia is necessary to avoid agitation, hypertension, shivering and vomiting – problems that may result in raised intracranial pressure and bleeding. In addition, it is known that acute pain intensity predicts the development of chronic pain and that prolonged inflammatory pain leads to central sensitization.[7- 10] Hence; the present study was conducted for assessing postoperative pain after craniotomy.

In a similar study conducted by Rahimi SY et al, authors evaluated the efficacy of alternative pain management strategies for patients who have undergone craniotomy. Twenty-seven patients were randomly assigned to a control group (n = 13) receiving narcotics alone or an experimental group (n = 14) receiving a COX-2 inhibitor in addition to narcotic pain medications. The narcotics group was noted to have statistically significantly higher visual analog scale scores, increased length of stay, and increased narcotic use compared with the COX-2 group. The narcotics group also had increased hospitalization costs when compared with the COX-2 group. The use of scheduled atypical analgesics, such as COX-2 inhibitors, in addition to narcotics for the management of postoperative pain after craniotomy may provide better pain control, may decrease side effects associated with narcotic pain medications, may encourage earlier walking, and may reduce total hospitalization costs.[11]

Despite these advances in pain diagnosis and treatment, many clinicians consider intracranial surgery only to be associated with minimal patient discomfort. Indeed, a frequently cited retrospective chart review reported only minimal pain after brain surgery; however, this conclusion is based on only 90 minutes of postoperative observation of craniotomy patients who received more than 500 mg of intraoperative fentanyl.10- 12 Verchère E et al compared the analgesic efficacy of three different postoperative treatments after supratentorial craniotomy. Sixty-four patients were allocated prospectively and randomly into three groups: paracetamol (the P group, n = 8), paracetamol and tramadol (the PT group, n = 29), and paracetamol and nalbuphine (the PN group, n = 27). General anesthesia was standardized with propofol and remifentanil using atracurium as the muscle relaxant. One hour before the end of surgery, all patients received 30 mg/kg propacetamol intravenously then 30 mg/kg every 6 hours. Patients in the PT group received 1.5 mg/kg tramadol 1 hour before the end of surgery. For patients in the PN group, 0.15 mg/kg nalbuphine was injected after discontinuation of remifentanil, because of its mu-antagonist effect. Postoperative pain was assessed in the fully awake patient after extubation (hour 0) and at 1, 2, 4, 8, and 24 hours using a visual analog scale (VAS). Additional tramadol (1.5 mg/kg) or 0.15 mg/kg nalbuphine was administered when the VAS score was > or = 30 mm. Analgesia was compared using the Mantha and Kaplan-Meier methods. Adverse effects of the drugs were also measured. The three groups were similar with respect to the total dose of remifentanil received (0.27 +/- 0.1 mircog/kg/min). In all patients, extubation was obtained within 6 +/- 3 minutes after remifentanil administration. Postoperative analgesia was ineffective in the P group; therefore, inclusions in this group were stopped after the eighth patient. Postoperative

analgesia was effective in the two remaining groups because VAS scores were similar, except at hour 1, when nalbuphine was more effective (P = .001). Nevertheless, acquiring such a result demanded significantly more tramadol than nalbuphine (P < .05).[12]

CONCLUSION

Pain is experienced by the majority of patients after craniotomy; hence; the is a need of improving pain management among these patients.

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