

EFFECTS OF PRE OPERATIVE ADMINISTRATION OF DICLOFENAC POTASSIUM ON PAIN INTENSITY FOLLOWING IMPACTED MANDIBULAR THIRD MOLAR SURGERY

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ABSTRACT

Objectives: To evaluate the effect of pre operatively administered Diclofenac potassium, on the postoperative management of pain following removal of impacted lower third molars.

Material and Methods: The study was carried out in the Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar, from Jan 2009 to June 2009. Fifty patients were recruited in this study who were equally distributed into group I and group II. Post operative pain was assessed using a four-point Category Rating Scale.

Results: In this study more males were recruited than females and the ratio of male to female was 2:1. Majority of the patients (56%) recruited were in 3rd decade of life followed by 4th decade (32%). In group I, 80% were those who had no post operative pain after 48 hours while in group II 86% of the patients showed moderate to severe pain postoperatively.

Conclusion: This study illustrated the enhanced effects of preoperative administration of Diclofenac potassium on short-term postoperative pain, compared to those patients who do not receive diclofenac potassium prior to third molar surgery.

Keywords: Mandibular third molar, Pain intensity, Diclofenac potassium, Impacted.

INTRODUCTION

Surgical removal of wisdom teeth under local anaesthesia is widely carried out in general dental practice as well as in many Oral & Maxillofacial Surgical clinics and occupies an appreciable amount of clinical time.^{1,2} Postoperative pain and swelling are usually associated with this procedure as direct and immediate consequences.³ The adverse effects of the wisdom tooth surgery on the quality of life has been reported to show a three-fold increase in patients who experi-

ence pain and swelling alone or in combinations, compared to those who were asymptomatic. Many clinicians have, thus, emphasized the necessity for better pain and swelling control in patients who undergo third molar surgery.^{4,5}

The introduction of Non-steroidal anti-inflammatory drugs (NSAIDs) e.g Diclofenac potassium has significantly altered the management of postoperative pain in dentistry.⁶ There are two possible mechanisms for the efficacy of NSAIDs when administered prior to surgical trauma. The first may simply be a pharmacokinetic advantage. By administering the NSAIDs prior to pain onset, drug absorption would have begun and therapeutic blood level will be present at the time of pain onset. Second, the presence of a cyclooxygenase inhibitor at the surgical site may limit

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the production of prostaglandins and prostacyclins associated with hyperalgesia and edema.^{7,8,9}

The aim of this study was to evaluate the effect of pre operatively administered diclofenac potassium, on the postoperative management of pain following removal of impacted lower third molars.

MATERIAL AND METHODOLOGY

Fifty patients who attended the Department of Oral and Maxillofacial of Khyber College of Dentistry, Peshawar, from January 2009 to June 2009, requiring surgical removal of impacted mandibular third molar teeth under local anaesthesia were recruited in this study. Patients who had taken other analgesic drugs within 24 hours before surgery were excluded from the study. All recruited patients were free of pain. They were divided into two groups. In Group I, patients were given pre operative diclofenac potassium 50 mg orally starting 12 hours before the procedure and another dose given half an hour prior to surgery. Group II comprised of patients who were given no analgesics pre operatively. The degree of surgical difficulty was assessed using Winter’s and Pell-Gregory criteria¹⁰. Surgical extraction of the third molars was carried out with elevation and reflection of buccal mucoperiosteal flap under local anaesthesia. Post operative pain was assessed using a four-point Category Rating Scale¹¹ in which pain was recorded as:

- 0- No pain (patient experiences no discomfort)
- 1- Mild pain (almost unnoticeable pain)
- 2- Moderate pain (noticeable pain, but patient can still engage in routine daily activities)
- 3- Severe pain (very noticeable pain which disturbs the patient’s daily routine.

Z-test was applied to compare the pain score among the to groups.

RESULTS

Fifty patients were recruited in this study. Out of these, 33 were male while 17 were female with male to female ratio of 2:1. Majority of these patients (36%) were in age group of 21-25 years, followed by 20% in the age group of 26-30 years. The mean age of these patients was 27.3+6.3 years. The detail of age distribution is given in Table 1.

Radiographic analysis of the type of impactions showed that mesio-angular impaction constituted 52%

of cases, followed by disto-angular impaction (20%) as shown in Table 2. Except at the pain score 1, highly significant difference was found in two groups regarding the pain levels. Patients with pain score 0 were significantly greater (p= 0.000) in group I while patients with pain score of 2 and 3 were significantly greater (p= 0.000, 0.009 respectively) in group II as compared to group I. In group I, 80% patients had no postoperative pain after 48 hours while 84% patients of group II had moderate to severe pain post-operatively. The details of pain intensity score is given in Table 3.

Table 1: Age Distribution

Age in years	Frequency	Percentage
16-20	6	12
21-25	18	36
26-30	10	20
31-35	9	18
36-40	7	14

Table 2: Type of Impaction

Type of impaction	Number	Percentage
Mesioangular	26	52
Distoangular	10	20
Horizontal	8	16
Vertical	6	12

Table 3: Pain intensity score

Pain score	Group I (n=25)	Group II (m=25)	Z-test	P=value
0	20(80%)	1(4%)	5.44	0.000
1	4(16%)	3(12%)	0.41	0.684
2	1(4%)	15(60%)	-4.24	0.000
3	0(0%)	6(24%)	-2.61	0.009

DISCUSSION

By pharmacologically controlling the extent of the inflammatory process, the intensity or severity of postoperative sequelae such as pain, may be reduced.⁴ One technique for post operative pain reduction is to control the synthesis of prostaglandins. Prostaglan-

dins play a major role in the induction of pain, inflammation, and fever.^{4,6} The reduction of biosynthesis of prostaglandins by inhibition of the cyclooxygenase enzyme system is considered an important mechanism of action of NSAIDs. When administered pre operatively, NSAIDs have been shown to be particularly effective in combating postoperative pain.⁶

Preventive strategies for postoperative management of pain and inflammation are based on the known ability of NSAIDs to block the arachidonic acid cascade. When NSAIDs are administered preoperatively, absorption and distribution of the medication may occur before the initiation of tissue trauma, the ensuing synthesis of prostaglandins and the subsequent inflammatory response. Prevention of the inflammatory response may decrease the sequelae of tissue trauma; especially the accompanying pain.^{10,11} Diclofenac potassium has been shown to be useful in controlling postoperative pain after removal of third molars.^{10,12}

The present study assessed the clinical effect of Diclofenac potassium on pain. The pattern of postoperative pain has been reported to increase between the post-operative days 1 and 3, after which the symptoms subside gradually within one week.⁸⁻¹⁴ The results of the present study confirm this observation. The comparison of pain score intensity between group I and group II showed significant difference between the two groups (Table 3) indicating an enhanced analgesic effect of Diclofenac potassium when administered pre and post operatively. This finding corroborates with those of previous reports.^{15,16,17} Apfelbaum¹⁸ mentioned that Diclofenac potassium when given in doses similar to the therapeutic doses given for post operative pain is sufficient to alleviate post operative pain when administered pre operatively. Similar result was reported by Becker¹⁹ with 50-75mg Diclofenac Pottassium given 12-24 hours pre operatively.

CONCLUSION

This study illustrated the enhanced effects of preoperative administration of diclofenac potassium on short term postoperative pain, compared to those patients who do not receive Diclofenac potassium prior to third molar surgery.

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