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Original Research Article.

Comparison of Analgesic Efficacy of Ibuprofen and Ibuprofen Plus Acetaminophen for Pain Management After Third Molar Surgery

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ABSTRACT

Background: Transalveolar extraction is a time consuming procedure and it generally the most feared one. For adequate pain control it is necessary that the patients are prescribed appropriate analgesics for at least first 24 hours. With the advent of non steroidal anti inflammatory drugs there has been significant reduction in pain in both dentistry and medicine. The main aim of the present study is to compare the analgesic efficacy of 400 mg of ibuprofen with combination of ibuprofen and acetaminophen in providing pain relief after extracted of impacted third molar tooth.

Materials and Methods: The present study was conducted in the Department of Oral and Maxillofacial surgery, PGI, Rohtak, Haryana (India) during a period of 1 year. All the subjects were informed about the study and the study was approved by the Institutional ethical committee. Patients were divided into two groups, Group I patients received combination of ibuprofen and acetaminophen and Group II patients received only Ibuprofen. The patients were not informed about the drug they were given. All the patients were prescribed antibiotics postoperatively (Amoxycillin 500 mg and Metrogyl 400 mg). Single dose of preoperative analgesic was given to every patient 30 minutes prior to the surgery. Pain was recorded on the visual analog scale 20 minutes, 1 hour and 4 hours after surgery. All the data was arranged in a tabulated form and analysed using SPSS software. Student t test and chi square tests were used for analysis. Probability value of less than 0.05 was considered significant.

Results: The mean age of the subjects was 31.22+/-1.32 years. There were 69(57.5%) males and 51(42.5%) females in this study. Majority of the subjects were between 26-35 years of age. There were 48.3% (58) subjects in Group I and 49.2 %(59) subjects in Group II who had a no pain preoperatively. There were 27.5% (33) subjects in Group I and 25 %(30) subjects in Group II who had a mild pain preoperatively. Severe pain was seen in 15 %(18) subjects in Group I and 18.3% (22) subjects of Group II. At 4 hours postoperatively, there were 5.8% subjects in Group I and 3.3 %(4) subjects who had no pain. There were still 5.8% subjects in Group I and 6.7% subjects in Group II who had severe pain. Mild pain was seen 64 subjects of Group I and 60 subjects of Group II. There was no significant difference between both the groups as p value more than 0.05.

Conclusion: From the above study we came to the conclusion that combination of acetaminophen and ibuprofen does not offer significant pain control compared to ibuprofen alone.

Keywords: Acetaminophen, Ibuprofen, Pain, Postoperative.

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INTRODUCTION

Transalveolar extraction of third molar is the most extensively carried out procedure under local anaesthesia. It is a time consuming procedure and it generally the most feared one also.[1] Surgical extraction of teeth involves raising of flap and bone cutting that involves intense inflammatory response accompanied by pain.[2] This inflammatory response activates the kinin system and causes the release of bradykinin which is responsible for mediating pain. According to a study it was estimated that there are 63.5% of the patients suffer from severe pain during the first day of surgery. For adequate pain control it is necessary that the patients are prescribed appropriate analgesics for at least first 24 hours.[3] With the advent of non steroidal anti inflammatory drugs there has been significant reduction in pain in both dentistry and medicine. They are generally considered as ideal choice of drugs for the management of mild to moderate pain that is associated with transalveolar extraction of third molar.[4] Ibuprofen is one such

drug of choice that is used widely for reducing postoperative pain associated with extraction.[5] Another drug acetaminophen is an analgesic and antipyretic that also provides adequate relief against mild to moderate type of pain.[6] There exists a controversy regarding the mechanism of action of the drug but its primary action is inhibition of prostaglandin synthetase in the central nervous system.[7] The maximum safety dose of acetaminophen allowed per day is 4g, at this dose it doesn't provide sufficient pain relief therefore it is generally combined with other NSAIDS for adequate action.[8] Combination of analgesics provides the opportunity of increasing the analgesic efficacy without increasing the dosage and side effects associated with them.[9] The main aim of the present study is to compare the analgesic efficacy of 400 mg of ibuprofen with combination of ibuprofen and acetaminophen in providing pain relief after extracted of impacted third molar tooth.

MATERIALS AND METHODS

The present study was conducted in the Department of Oral and Maxillofacial surgery, PGI, Rohtak, Haryana (India) during a period of 1 year. All the subjects were informed about the study and the study was approved by the Institutional ethical committee. A written informed consent was obtained from all the subjects. Healthy subjects belonging to ASA grade I or II with the age range of 16- 55 years were included in the study. Patients allergic to NSAIDS, with local infection or belonging to ASA grade III or IV were excluded from the study. Patients with any bleeding disorder, history of asthma or alcohol or drug abuse were also excluded from the study. Patients with presence of signs and symptoms of local infection like fever, decreased mouth opening, swelling or pus discharge were also excluded from the study. Patients were divided into two groups, Group I patients received combination of ibuprofen and acetaminophen and Group II patients received only Ibuprofen. The patients were not informed about the drug they were given. All the patients were prescribed antibiotics postoperatively (Amoxycillin 500 mg and Metrogyl 400 mg). Single dose of preoperative analgesic was given to every patient 30 minutes prior to the surgery. All the transalveolar extractions were performed by a single operator. After giving inferior alveolar and buccal nerve block, a full thickness mucoperiosteal flap was raised. This was followed y removal of buccal bone by bone guttering and elevation of tooth. A thorough irrigation was done and closure was done using 3-0 silk sutures. The mean duration of surgery was 21 minutes, range between 15- 25 minutes. The surgery was categorised as mild, moderate and difficult by the surgeon based on the amount of osteotomy and odontotomy required. It was considered as mild if only little buccal guttering was required without tooth sectioning. It was regarded as severe if both bone guttering and tooth sectioning was required. Patients were instructed to use the analgesic provided to them, 1 hour after the procedure. They were advised to continue using it every 6 hourly. Pain was recorded on the visual analog scale 20 minutes, 1 hour and 4 hours after surgery. All the data was arranged in a tabulated form and analysed using SPSS software. Student t test and chi square tests were used for analysis. Probability value of less than 0.05 was considered significant.

Table 1: Demographic detail of the subjects

DEMOGRAPHICS		FREQUENCY	PERCENTAGE
Gender	**Male**	69	57.5
	Female	51	42.5
Age group	**16-25**	31	25.8
	26-35	42	35
	36-45	29	24.2
	46-55	18	15

Table 2: Pain scores amongst the subjects

PAIN SCORES		GROUP I (n/%)	GROUP II (n/%)	P VALUE
Preoperative	**No pain**	58/48.3%	59/49.2%	>0.05
	Mild pain	33/27.5%	30/25%	
	Moderate pain	29/24.1%	31/25.8%	
	Severe pain	0/0	0/0	
Postoperative (20 mins)	**No pain**	0/0	0/0	>0.05
	Mild pain	54/45%	43/35.8%	
	Moderate pain	60/50%	67/55.8%	
	Severe pain	8/6.7%	10/8.3%	
Postoperative (1 hour)	**No pain**	1/0.8%	0/0	>0.05
	Mild pain	50/41.7%	44/36.7%	
	Moderate pain	51/42.5%	54/45%	
	Severe pain	18/15%	22/18.3%	
Postoperative (4 hours)	**No pain**	7/5.8%	4/3.3%	>0.05
	Mild pain	64/53.3%	60/50%	
	Moderate pain	42/35%	48/40%	
	Severe pain	7/5.8%	8/6.7%	

RESULTS

In this study a total of 120 subjects were enrolled. The mean age of the subjects was 31.22+/-1.32 years. Table 1 shows the demographic details of the subjects. There were 69 (57.5%) males and 51 (42.5%) females in this study. Majority of the subjects were between 26-35 years of age. There were 42 (35%) subjects in this age group. The least number of subjects were between 46-55 years of age. There were 18(15%) subjects in this age group. There were 29 (24.2%) subjects between 36-45 years of age. there were 31 (25.8%) subjects between 16-25 years of age.

Table 2 illustrates the mean pain scores amongst the subjects. There were 48.3% (58) subjects in Group I and 49.2 % (59) subjects in Group II who had a no pain preoperatively. There were 27.5% (33) subjects in Group I and 25 % (30) subjects in Group II who had a mild pain preoperatively. There were 24.1% (29) subjects in Group I and 25.8 % (31) subjects in Group II who had a moderate pain preoperatively. None of the patients in any group had severe pain. After a period of 20 minutes postoperatively, there were 45 %(54) subjects in Group I and 35.8 % (43) subjects in Group II who had mild pain. Approximately 50 % (60) subjects in Group I and 55.8 %(67) subjects in Group II had moderate pain. Severe pain was seen amongst 6.7% subjects of group I and 8.3% subjects of Group II. After a period of 1 hour, there was 1 subject in Group I who had no pain. Mild pain was seen in 41.7 %(50) subjects of Group I and 36.7% (44) subjects of Group II. There was moderate pain in 42.5 % (51) subjects of Group I and 45% (54) subjects of Group II. Severe pain was seen in 15 % (18) subjects in Group I and 18.3% (22) subjects of Group II. At 4 hours postoperatively, there were 5.8% subjects in Group I and 3.3 % (4) subjects who had no pain. There were still 5.8% subjects in Group I and 6.7% subjects in Group II who had severe pain. Mild pain was seen 64 subjects of Group I and 60 subjects of Group II. There was no significant difference between both the groups as p value more than 0.05.

DISCUSSION

Impacted teeth are amongst the common reasons for extraction other than decay and periodontitis. The most commonly associated with transalveolar extractions are pain, trismus and edema.[10] It has been seen that maximum amount of pain associated with removal of impacted teeth is seen in 3 hours after surgery[5,11] and the symptoms start to decline within one of the operation[1]. Since prostaglandins are the prime and chief agents responsible for pain and inflammation, control of these can help in controlling the symptoms associated with extraction.

The main action of NSAIDS is inhibition of cyclo oxygenase enzyme that is responsible for the synthesis of prostaglandins. Preoperative administration of NSAIDS have aided in controlling postoperative pain.[11] In a study conducted by Dionne et al[12], to evaluate whether the use of ibuprofen is associated with reduction in postoperative pain or not. They concluded that preoperative single dose of ibuprofen is capable of delaying the mean onset time of postoperative pain by 100 minutes as compared to a placebo. Ibuprofen is a potent NSAID that is capable of anti-inflammatory properties.[13] But there are also various side effects associated with ibuprofen like nausea, epistaxis, gastritis, rash, dizziness, hypertension associated with fluid retention.[14] Photosensitivity is another commonly associate problem with ibuprofen as with other NSAIDS and chronic high doses of ibuprofen is associated with increased risk of myocardial infarction.[15]

Acetaminophen is an aniline derivative that has both analgesic and antipyretic properties. Its chemical structure is similar to aspirin and it is one of the most commonly used drugs worldwide. Because of its similar structure like aspirin, it is also recognised by the enzyme responsible for synthesis of prostaglandins.[16] A wide variety of studies have been done to determine the analgesic efficacy of acetaminophen after third molar surgery.[10] Excessive use of acetaminophen is also associated with gastrointestional problems and liver damage. It is a hepatotoxic drug. Various studies have also shown that chronic users of acetaminophen are associated with higher chances of developing blood cancer.[17] In a study conducted by Mitchell A et al[18], they found that use of combination of ibuprofen and acetaminophen are a safe and effective modality of pain control after surgery. In our study, after a period of 20 minutes postoperatively, there were 45 % (54) subjects in Group I and 35.8 %(43) subjects in Group II who had mild pain. Approximately 50 % (60) subjects in Group I and 55.8 % (67) subjects in Group II had moderate pain. Severe pain was seen amongst 6.7% subjects of group I and 8.3% subjects of Group II. At 4 hours postoperatively, there were 5.8% subjects in Group I and 3.3 % (4) subjects who had no pain. There were still 5.8% subjects in Group I and 6.7% subjects in Group II who had severe pain. Mild pain was seen 64 subjects of Group I and 60 subjects of Group II. There was no significant difference between both the groups as p value more than 0.05. This study was in contrast to the results of the study by Merry A. F. et al[8], according to whom there was a significant relief in pain with combination of acetaminophen and ibuprofen postoperatively during the first 48 hours after surgery. The few limitations of our study were, smaller sample size and less postoperative follow up duration .

CONCLUSION

From the above study we came to the conclusion that combination of acetaminophen and ibuprofen does not offer significant pain control compared to ibuprofen alone. Though the pain control was better with the combination drugs but there was no significant difference.

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