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Analgesic Efficacy of Piroxicam Compared to Paracetomol in the Treatment of Post Extraction Dental Pain

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Abstract

Paracetomol is an NSAID with only analgesic properties it doesn't relieve inflammatory pain.The analgesic activity of piroxicam, a well-known NSAID has been documented in many pain states. The purpose of this study was to assess the efficacy and the rapidity of action of piroxicam in comparison with standard paracetamol following surgical extraction of teeth.The aim of the study was to compare the efficacy and rapidity of action of piroxicam and paracetamol in the treatment of post extractive dental pain The study consisted of 30 patients of both sexes and in good health. Patient seeking dental extraction were included in this study. They were specifically selected on the criteria of reporting to Saveetha dental college and hospitals for tooth extractions only. Each participant was given a brief explanation of the study, and informed consent was obtained from each participant before inclusion in the study.From the result of this study, it is clearly evident that patient who received piroxicam has less dental pain when compared with patient who received paracetamol. This will help clinicians in prescribing medication after dental extraction.

Key words*: Piroxicam, Paracetamol, Post-operative extractions.*

I. Introduction

Dental extractions always cause apprehensions with patients both in terms of pain they have to endure and the post extraction impact they would experience. It is due to various factors including the psychological influence that patient goes through before and after surgery. It is always a delicate but important task in the hands of dentists to prepare the patients before any dental extraction procedure and it is also critical to provide appropriate expectations of the discomfort the patients would experience and the oral hygiene process that they should follow. Pain is a common experience following post-operative dental extractions. Pain is mostly acute.

Post operative dental pain may occur due to a non-isotonic solution, adrenaline in the solution, trauma, surgical interference, marked tissue destruction, acute inflammatory conditions and infections. A study revealed that, two groups, each of 100 adult patients who had undergone either a periodontal or oral surgical procedure were asked to record their pain experience over a three day investigation period.

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The results show that post-operative dental pain is variable in its nature and intensity, but reaches its maximum intensity in the first 12 hours post-operatively. [1] Managing acute postoperative pain is inherent to dental practice. Safe and effective management of acute dental pain can be accomplished with non-opioid and opioid analgesics. To formulate regimens properly, it is essential to appreciate basic pharmacological principles and appropriate dosage strategies for each of the available analgesic classes. Non-steroidal anti-inflammatory drugs have shown to be very effective against pain that ranges from mild to moderate. The ability of NSAIDs to inhibit cyclooxygenases in platelets reduces the synthesis of thromboxane A2, which normally contributes to platelet aggregation. This accounts for the so-called antiplatelet effect of these agents and is a consideration following surgical procedures.

Piroxicam is a non-steroidal anti-inflammatory drug (NSAID) of the oxicam class which is used to relieve post-operative pain. It is available as tablets, capsules and prescription free gel 0.5% [2]. Like other NSAIDs, and mechanism of action is by inhibition of the cyclooxygenase enzyme, resulting in reduced prostaglandin synthesis, which is responsible for pain, stiffness, tenderness and inflammation. Piroxicam also inhibits thromboxane synthesis in platelets and thus inhibits the secondary phase of platelet aggregation [3]. Since platelets can be involved in the inflammatory process, this action may contribute to the efficacy of Piroxicam. It has a long half-life, but due to its slower absorption in the gastrointestinal tract its onset of action is also slow. When administered orally, it takes more than 30 minutes to produce relief of pain. Therefore piroxicam have a practical benefit in the management of post-operative pain [4].

Paracetamol is a mild analgesic. It is used for the relief pains and is a major ingredient in numerous cold and flu remedies. In general, prescribed for the post tooth extraction period. The dose of 1000 mg of paracetamol induces efficient analgesia after oral surgeries. Adequate plasma concentration level is established 90 minutes after oral administration. It should be prescribed in the dose of 60 to 90 mg/kg every six hours [5]. Their effect lasts between two to four hours. It is usually safe at recommended doses in combination with opioid analgesics; paracetamol can also be used in the management of more severe pain such as post-surgical and cancer pain. Though paracetamol is used to treat inflammatory pain, it is not generally classified as an NSAID because it exhibits only weak anti-inflammatory activity. Paracetomol appears to be safe during pregnancy and breastfeeding. It can be prescribed to patients with liver disease, but at low dosages [6].

Therefore clinician should mindful about the efficacy of drug in post extracted dental pain. Therefore present investigation about the comparison of efficacy of piroxicam and paracetamol in treatment of post extracted dental pain.

II. Materials and Method

Patient seeking dental extraction were included in this study. They were reported to Saveetha dental college and hospitals for extraction. Each participant was given a brief explanation of the study, and informed consent was obtained from each participant before inclusion in the study

To be included in the study, patients have some following criteria

Each patient should understand the pro form given to them. Patients were asked to report in scoring. Each patient must be about to have dental extraction. Each patient should understand and give the score to questionnaires. Each patient must be eligible and no contraindication should exist.

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Gender had no relationship with the scores. A total number of thirty healthy patients were selected. The drug paracetamol and piroxicam is given to 15 patients respectively, along with antibiotic (Amoxicillin). After three consecutive days they were asked to give their scoring mention in the pro form. The score indicates 0 (no hurt), 1(hurts little bit), 2 (hurts little more), 3(hurts even more), 4(hurts whole lot), 5(hurts worst). Higher scores indicate worse, and lower scores indicate better efficacy of drug in treatment of post extracted dental pain.

III. Result

Thirty healthy patients were included in this study. Gender has no relationship with the score. Patient has less dental pain while taking piroxicam when compared with patient having paracetamol. This study shows that the administration of piroxicam is more effective than paracetomol in the control of pain after dental extraction. Piroxicam appear to show that it is an effective analgesic for treating moderate to severe pain. From the result of this study it is concluded that patient has less dental pain while taking piroxicam when compared with patient having paracetomol. The scores are calculated in percentage are mentioned in Table 1, Table 2 and 3 shows the efficacy of piroxicam and paracetomol in three consecutive days.

Table 1: scores (%) for efficacy of piroxicam in three consecutive days

	0	1	2	3	4	5
Day 1		73.3%	20%	6.6%		
Day 2	26.66%	60%	13.3%			
Day 3	93.3%	6.6%				

Table 2: scores (%) for efficacy of paracetamol in three consecutive days.

	0	1	2	3	4	5
Day 1		26.6%	53.3%	20%		
Day 2	33.3%	46.6%	20%			
Day 3	80%	20%				

IV. Discussion

Dental extraction has a psychological influence on the patients both before and after the surgery. It is always a delicate task in the hands of dentists to prepare the patients before any dental extraction procedure and it is also critical to provide appropriate expectations of the discomfort the patients would experience and the oral hygiene process that they should follow.The extraction of third molars is a common task carried out at dental/surgery clinics. Postoperative pain is one of the two most common complications of this surgery, along with dry socket. [7]

Dental pain is largely inflammatory and evidence based medicine has shown that non-steroidal anti-inflammatory drugs are the best analgesics for dental pain. [8]

NSAIDs have been used for more than 25 years to treat rheumatologic disease. They were then introduced to relieve pain after tooth extraction and to provide post-operative analgesia. The severity of postoperative dental pain can be variable depending on the type of procedure. Both centrally acting and peripherally acting analgesics, such as no steroidal anti-inflammatory drugs (NSAIDs), aspirin, and acetaminophen are used [9].

The efficacy of preventive analgesia depends on many factors, including, the nature of the tissue injury, and the degree of sensitivity of the nociceptors, the type of drugs used pre-emptively, the route and timing of drug administration, duration of its action, the degree of afferent nerve block, and finally the emotional, physiological, and psychological condition of the patients[10].

NSAIDs are generally better suited to ambulatory outpatients. The most commonly used postoperative dental pain model includes patients who have undergone surgical removal of impacted third molar teeth. Studies used various doses of piroxicam (5, 10, 20, and 40 mg), aspirin 648 mg, and placebo. Safety results showed that a wide range of piroxicam doses were safe when administered in single doses [11]. Although neither piroxicam 5 mg nor 10 mg produced clinically significant analgesia, 20-mg and 40-mg doses were significantly superior to placebo and both were comparable with aspirin 648 mg over the initial six hours.

Piroxicam 20 mg and 40 mg, however, produced significantly longer durations of analgesia than aspirin 648 mg, and it appears that the analgesic effect of piroxicam may extend for up to 24 hours in a substantial proportion of patients. A combination of Piroxicam and paracetamol has proved to be more effective than the two alone. This conclusion is consistent with many previous expert reviews that recommend the use of combination analgesics. [12]

When used alone, they are effective in relieving minor to moderate pain such as that seen after maxillofacial, minor orthopedic or some ambulatory surgical procedures and postpartum pain NASIDs have additional anti-inflammatory activity, lacking in opioids, which plays an important role in relieving post-operative pain and inflammation. [13]

Based on Table 1,thepiroxicam appears to show that it is an effective analgesic for treating moderate or severe postoperative pain. Sublingual administration should have had a significantly faster onset of action compared with oral administration. [14] In a different experimental protocol this could improve pain relief in the postoperative period, yet in the present study it was not possible, nor was it the aim, to compare the onset of pain relief by piroxicam since patients were still under the effects of local anesthesia from the surgery. Patients were given piroxicam immediately following the end of surgery. [15]

A rank order of the efficacy of different analgesic compared with paracetamol exists which allows comparison between different analgesics. This has been published previously in its entirety and for third molar extraction studies only (Barden 2004). It is also available on the World Wide Web. This rank order shows that piroxicam has a lower score (better) when compared to paracetamol. Its efficacy is comparable to that of other NSAIDs, for example ibuprofen and diclofenac. [16]

Piroxicam is used for tooth pain, musculoskeletal conditions, swelling, stiffness and others such as joint pain, headache, toothache, and other conditions. It is a salt combination[17]. It can also be given for other conditions such as fever, cold, flu and osteoarthritis[18]. They do show side effects which maybe be rare but severe. Side effects administration of piroxicam usually show are, sickness, skin reddening, allergic reaction, swollen face, liver damage, abnormalities of blood cells, nausea, rashes, liver toxicity. [19]

Their mechanism of action is increasing the pain threshold, increasing the blood flow, decreasing the production of prostaglandins the cause pain. Postoperative patients do genuinely develop fevers for a number of reasons; some related to the anaesthetic techniques and surgical handling, others due to infective complications[20]. Piroxicam also has anti-pyretic properties and would have acted to reduce the number of participants experiencing fevers. Thus it would be misleading to look for fever as an adverse effect. According to the intramuscular administration and half-life of Piroxicam (about 57 hours) versus intravenous infusion and half-life of Paracetamol (two to three hours) increased duration of follow-up and use of additional doses of Paracetamol during follow-up will provide better comparison between Piroxicam and Paracetamol. [21]From the result of this study (as shown in Table 1 and Table 2), it is clearly evident that patient who received piroxicam has less dental pain when compared with patient who received paracetamol. This will help clinicians in prescribing medication after dental extraction.

V. Conclusion

Piroxicam is a non-steroidal anti-inflammatory drug (NSAID) is used to relieve post-operative pain. Like other NSAIDs, mechanism of action is by inhibition of the cyclooxygenase enzyme, resulting in reduced prostaglandin synthesis, which is responsible for pain and inflammation. Paracetamol is a mild analgesic. It is used for the relief pains and is a major ingredient in numerous cold and flu remedies. In combination with opioid analgesics, paracetamol can also be used in the management of more severe pain such as post-surgical and cancer pain. From this study, it is clearly evident that patient who received piroxicam has less dental pain when compared with patient who received paracetamol associated with antibiotics (amoxicillin). This will help clinicians in prescribing medication after dental extraction.

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