ORIGINAL ARTICLE

EFFECTIVENESS OF PRETREATMENT PREDNISOLONE ON POSTENDODONTIC PAIN IN COMPARISON TO PLACEBO

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ABSTRACT

The objective of the study was to compare the effectiveness of pretreatment prednisolone on post-endodontic pain in comparison with placebo. Patients of irreversible pulpitis were arbitrarily divided into two equal groups (group A & group B) each comprising of 45 patients. In group A premedication (prednisolone) was given and in group B placebo was given. Pain level was evaluated on visual analogue scale as no , mild, moderate or severe pain according to score. The overall effectiveness was noted after 24 hours. It was concluded that Pretreatment prednisolone was more effective for prevention of Postendodontic (PEP) pain in comparison to placebo.

Key Words: *Prednisolone; Postendodontic pain; VAS.*

INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential damage or described in terms of such damage".[1] 40% patients present with pain of different degrees after root canal treatment.[2] Pain after root canal treatment can be due to microbial, mechanical or chemical damage to the periapical area that will cause acute inflammation.[3]

There are three pharmacologic strategies for the management of post-endodontic pain: 1) Drugs that block inflammatory mediators that activate or sensitize pulpal nociceptors (e.g., NSAIDs and glucocorticoids); 2) Drugs that block impulse propagation along the peripheral nerves; and 3) Drugs that block central mechanisms of hyperalgesia and pain perception.[4] Glucocorticoids suppress the inflammatory mediators. Glucocorticoids reduce the prostaglandin, leukotriene synthesis that are released from activation of phospholipase- A2 which reduced the expression of cyclooxygenase-2 in inflammatory cells.[5]

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Anti-inflammatory and pro-inflammatory mediators are blocked by single dose of glucocorticoid.[6] A single dose of glucocorticoid is almost without side effects.[7] The usually used systemic glucocorticoids are dexamethasone, prednisolone, hydrocortisone and methylprednisolone.[8] Prednisolone is an anti-inflammatory drug that reduces prostaglandin and leukotriene synthesis by inhibiting phospholipase-A2, a preoperative, single oral dose of 30mg of prednisolone significantly reduced pain after root canal treatment.[9]

The aim of this study was to evaluate the effect of preoperative single oral dose of prednisolone on post endodontic pain after 24 hours in comparison with placebo. Prednisolone blocks chemical mediators before they are released and helps to reduce post-endodontic pain. This study proved that pre-operative single dose of prednisolone was effective and helped to reduce post-endodontic pain.

METHODOLOGY

This study was done in operative Dentistry Department, Nishtar Institute of Dentistry, Multan. The study design was randomized controlled clinical trial. The study was completed in six months. The sample size was 90 patients, 45 patients in each group, with 99% power of test, with 5% level of significance taking expected percentage of effectiveness i.e 85% with prednisolone and 15% with placebo. Non-Probability sampling technique was used.

Patients with irreversible pulpitis diagnosed clinically (By hot and cold test) and radiographically; maxillary or mandibular teeth; Patients of age 20-50 years of both genders and patients who would not had

taken any analgesic and Inflammatory drugs for at least 6 hours before clinical procedure were included in this study.

Patients who gave history of allergy, sensitivity or were unable to take medication (through history), who had periodontal disease, acute endodontic or periodontal abscess, who required prophylactic antibiotics, who had systemic diseases like hypertension (Blood Pressure >140/90mmHg), Diabetes Mellitus (Blood Sugar Range >200mg/dl), deranged Renal Function Tests (serum creatinine >1.2mg/dl) and mentally disable and pregnant ladies or patients on nursing were excluded from this study.

Permission was taken from Institutional Ethical Committee to conduct this study. 90 patients visiting the OPD of Department Operative Dentistry, Nishtar Institute of Dentistry, Multan were selected after fulfillment of inclusion criteria. Informed consent and demographic profile was obtained from each patient.

Patients were arbitrarily allocated into two equal groups. In Group A, 30mg of prednisolone was given 30 minutes before starting root canal treatment. In Group B, placebo was given 30 minutes before starting root canal treatment. After 30 minutes conventional single visit root canal treatment was started under rubber dam isolation using crown-down technique of instrumentation.

Patients in each group were taught to complete a pain chart based on VAS 6, 12 and 24 hours after treatment given to them. Patients were educated to mark on the line according to their level of perceived pain. Patients were recalled after 24 hours of root canal treatment. Pain diary was collected from them. Effectiveness was labeled.

RESULTS

Details of results can be seen in Table 1-2 and in Fig 1.

DISCUSSION

25% to 40% patients having root canal treatment have complaint of pain after treatment.[10] Causes of

TABLE 1: AGE DISTRIBUTION OF THE PATIENTS WITH IRREVERSIBLE PULPITIS

Age (in years)	Group	
	A	B
20-30	18(40%)	17(37.8%)
31-40	14(31.1%)	15(33.3%)
41-50	13(28.9%)	13(28.9%)
Total	45(100%)	45(100%)

Age (±S.E.M.) of Group A Patients = 33.69±1.22 years
Age (±S.E.M.) of Group B Patients = 33.69±1.24 years

TABLE 2: OUTCOME OF PREMEDICATION IN PATIENTS WITH IRREVERSIBLE PULPITIS AMONG GROUPS

Outcome (in terms of no pain)	Group		P-value
	A	B	
Success	34(75.6%)	12(26.7%)	<0.0001
Failure	11(24.4%)	33(73.3%)	
Total	45(100%)	45(100%)	

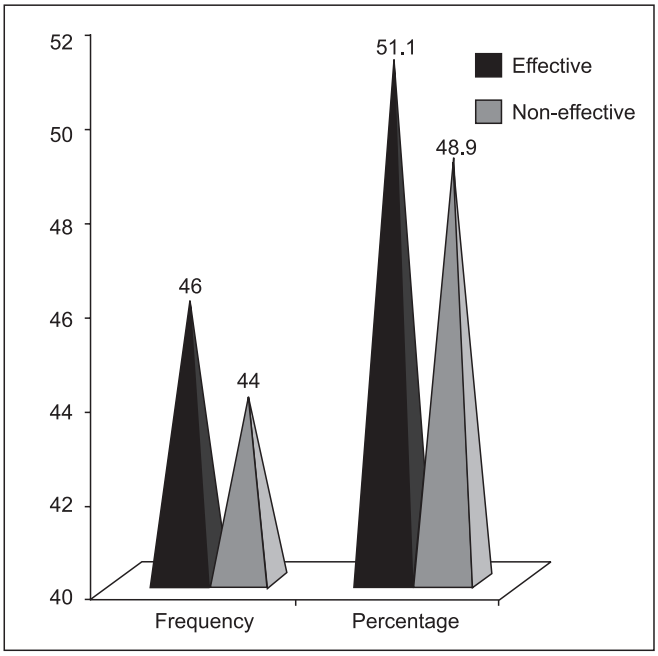

Fig 1: Analysis of effectiveness of premedication

Post-endodontic pain are mostly microbial, mechanical or chemical injury of the pulp or periradicular tissues.[11] Endodontic therapy produces local trauma and subsequent inflammation. Inflammation is initiated by Prostaglandins, bradykinin and histamine. Prostaglandinss raise chemotactic activity, increase vascular permeability, sensitize pain receptors to inflammatory mediators and are a reason for pain after endodontic therapy.[12] Pharmacological management of pain should be considered together with definitive dental treatment.[13]

Unlike NSAIDS, which block only prostaglandins, glucocorticoids not only inhibit prostaglandins but also thromboxanes and leukotrienes.[14] Prednisolone inhibits phospholipase A2 and decrease leukotriene and prostaglandin synthesis, reducing chemotaxis of polymorphonuclear leukocytes. It increase interleukin-10 (IL-10) and down-regulate pro-inflammatory cytokines.[7,9,15,16]

In this study 90 patients were included. When Post-endodontic pain was evaluated after 24 hours

effectiveness of prednisolone was 75.6% in comparison to placebo 26.7%. It means in Group A 24.4% and in Group B 73.3% pretreatment medication was non-effective.

A study did by Gallatin et al 40 patients with irreversible pulpitis were given an injection of either 1 ml (40mg/ml) of methylprednisolone or 1 ml of saline by intraosseous route. Intraosseous injection of methylprednisolone cause a significant reduction of postoperative analgesic use over the 7-day observation period. In methylprednisolone group number of patients who don't use analgesic was 63% on first day and 74% on day seven compared to upto 29% with placebo on day first and seven.[17]

Similar results reported by Mehrvarzfar et al in his study in which after completion of first visit of root canal treatment in patients having irreversible pulpitis, He gave a supraperiosteal injection of either lidocaine 2% or 1 mL dexamethasone. Post-endodontic pain was evaluated using visual analogue scale. Patients given Dexamethasone reported less pain after 6, 12 and 24 hours after the first appointment and the difference between both groups was statistically significant ($P < 0.05$). Dexamethasone was most effective during the first 24h at controlling the incidence and severity of postoperative pain. After 48 hrs no difference was found between two groups (placebo 8%, dexamethasone 8%) ($P > 0.05$).[18]

A similar study done by Jalalzadeh et al who compared single oral dose of prednisolone pretreatment with placebo on Post-endodontic Pain. He assessed pain by using Visual Analogue Scale given to patients which they filled after 6, 12 and 24 hours. His findings were that the prednisolone was effective 75%, 80%, and 85% at 6, 12, and 24 hours, respectively; and for placebo group, the effectiveness was 30%, 25%, and 15%, respectively.[09]

CONCLUSION

The results of this study suggests that pretreatment single oral dose of prednisolone effectively reduces post-endodontic pain.

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2 Naghma Parveen:	Supervise thestudy, final approval of the version to be published.
3 Amina Ghaffar:	Revised it critically for important intellectual content.
4 Qudsia Iqbal:	Revised it critically for important intellectual content.