

EFFICACY OF PRETREATMENT WITH SINGLE DOSE PREDNISOLONE IN REDUCING POST-ENDODONTIC PAIN

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ABSTRACT

Objective: To determine the efficacy of pretreatment with single dose prednisolone in reducing post-endodontic pain within 24 hours of the procedure.

Materials and Methods: This study was randomised Clinical Trial (RCT) comprising 110 patients of both genders reported to for non-surgical endodontic treatment over the period of six months. Patients were divided into two groups equally by blocked randomisation. Patients in group I was given placebo (dextrose capsule), and those in group II were given Prednisolone (30mg) orally 30 minutes before the procedure of root canal. Tablet was disguised in a manner that the patient was not aware of medication he was taking. Patients were then asked to mark their pain level experience on Visual Analogue Scale (VAS) both before treatment and 24hrs after endodontic treatment. All the findings were entered in the proforma. Data were analysed using SPSS version 20.

Results: Mean age of the total 110 patients of both groups was 48.85±9.95. Where 63 (57.3%) were male patients and 47(42.7%) were female patients. In group-I (Dextrose capsule) was no pain found in, 10 (18.2%), mild pain 20 (36.4%), moderate pain 15 (27.3%) and severe pain was found in 10 (18.2%) out of 55 patients. In group II (Prednisolone), no pain was found in 45(81.8%), mild pain 05(9.1%), moderate pain 05(9.1%) no one found with severe pain out of 55 patients. Pain intensity showed a statistically significant decline after 24 hours ($P=0.001$).

Conclusion: Pre-treatment with Prednisolone resulted in significant reduction in post-endodontic pain.

Keywords: Post endodontic pain, Prednisolone, Steroidal anti-inflammatory drugs, Pre-treatment

INTRODUCTION:

Dental pain is the primary reason for the patients to seek dental treatment. Pulpal disease affects the quality of life, mainly through physical pain and psychological discomfort¹. After endodontic treatment, there has been the resolution of patient's complaints and improved quality of life. However, literature establishes that pain after the endodontic treatment is around 25-40% in all endodontic patients.^{2,3}

Patients with severe pre-operative pain tend to have severe post-endodontic pain than the patients with

mild pre-operative pain⁴. Females have shown more flare-ups after endodontic treatment than the males. Potential causes include endodontic instrumentation, intracanal medications⁵, irritating irrigants⁶, peri-apical contamination due to trauma⁷, temporary restorations in hyper-occlusion etc⁸. This persistent pain could be to the result of inadequate healing after RCT, or because of non-endodontic sources. Non-odontogenic pain makes up to 50% of the persistent pain cases in maxillofacial area⁹. All these factors trigger an acute inflammatory reaction, mostly resulting in pain and swelling.¹⁰ Post RCT pain is highly prevalent, but it declines within 24hrs of treatment¹¹ and decreases continuously to minimum levels in 7 days¹.

Management of pain associated with root canal treatment is a challenging task for dentists. Various

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methods are in practice to manage pain like occlusal reduction, prescription of analgesics, use of non-steroidal analgesics, steroidal agents anaesthetic agents and narcotic analgesics¹². As in most of the cases, endodontic pain is caused by chronic inflammation, the presence of inflammatory mediators, bacterial by-products. Pain can be controlled by using glucocorticoid steroids². Compared to multiple doses given postoperatively, a single preoperative, a dose of anti-inflammatory drugs can reduce inflammatory mediators release and decrease the resultant pain^{8,10,13}. The anti-inflammatory effect of glucocorticoids was first acknowledged and applied in endodontics ago by Steward et al. five decades ago¹⁴. However, an absolute anti-inflammatory protocol to control and prevent manifestation pain after endodontic treatment has not been established yet^{10,15}.

The objective of this study was to determine the efficacy of Prednisolone administered as a single pre-operative dose to prevent and eradicate post-endodontic pain.

MATERIALS AND METHOD:

The design of this study was randomised Clinical Trial (RCT) comprising 110 patients of both genders, reported for non-surgical endodontic therapy over the period of six months. Patients were divided into two groups equally by blocked randomisation as a block of 10, in which even numbers were placed in Group I whereas, an odd number was assigned to Group II. Patients who required non-surgical endodontic therapy in single-rooted teeth with irreversible pulpitis were included in the study. Pain characteristic found in these patients was dull, spontaneous in origin, persisting for 10-20 minutes. Patients who have taken analgesics and anti-inflammatory drugs in last 6 hours, having an endodontic or periodontal abscess or sustaining systemic conditions that are a contraindication for the use of corticosteroids were excluded from the study.

Patients were explained about the study and informed written consent for participation in the study was taken after approval from the ethical committee. Patients in group I was given placebo (dextrose capsule), and those in group II were given Prednisolone (30mg) orally 30 minutes before the procedure of root canal. Patients were blinded from the medicine they are taking. Patients were then asked to mark their pain level experience on Visual Analogue Scale (VAS) both before treatment and 24hrs after endodontic treatment.

All the findings were entered in the proforma.

Data were analysed using SPSS (version 20). Descriptive statistics were calculated for both qualitative and quantitative variables. For qualitative variables like gender, pain, efficacy, frequency and percentage calculated. For quantitative variables like age, mean S.D. was calculated. Paired t-test was used to compare the frequency of pain between two groups. A (P) value ≤ 0.05 considered as significant.

RESULTS:

A total sample of 110 patients was divided into two groups, Group-I (Dextrose capsule) and Group-II (prednisolone), 55 patients were in every two groups included in this study. Mean age of all patients of both groups was 48.85 ± 9.95 . 63 (57.3%) were male patients and 47(42.7%) were female patients. In group-I (Dextrose capsule) no pain was found in, 10(18.2%), mild pain in 20 (36.4%), moderate pain in 15(27.3%) patients. Severe pain was found in 10(18.2%) out of 55 patients. In group II (Prednisolone), 45 patients reported no pain (81.8%), the frequency of mild and moderate pain was equal 05(9.1%), while no one reported with severe pain. Overall pain intensity showed a statistically significant decline after 24 hours ($P < 0.001$) (Table 2). Prednisolone treatment was associated with the lowest levels of endodontic pain in both genders.

DISCUSSION:

Use of corticosteroids in the alleviation of post-endodontic pain has been discussed by many researchers^{10,17-19}. The anti-inflammatory effect is attained if therapeutic levels are obtained before the procedure. An oral formulation of the drug was preferred as it is more convenient and effective clinically; the administration of intramuscular or intravenous injection is mostly associated with fear and discomfort and is not well-tolerated by many patients.

We have use placebo in one group as prednisolone (steroidal anti-inflammatory) drug in another group. This result of data show no significant decline in pain intensity in a group of patients with placebo drug in 24hrs after endodontic treatment. Jalalzadeh et al. 85% patient felt reduced pain with the use of prednisolone whereas in placebo group pain intensity decreased only by 15%^{20,21}. On the contrary, many other studies stated the significant decrease in pain, up to 71% with

Table-1: Age and gender-wise descriptive statistics

Mean Age (Years)	Std. Deviation
47.89	±9.58
Gender	N (%)
Male	63 (57.3)
Female	47(42.7)
Total	110(100)

Table-2: Frequency distribution of pain on VAS, Pre-treatment and post-treatment and in G 1 (Placebo) G2 (Prednisolone) groups (after 24 hours)

Group	Pain Frequency on VAS				Total
	No Pain	Mild	Moderate	Severe pain	
Pre-endodontic treatment	18	34	42	16	110
	16.4%	30.9%	38.2%	14.5%	100.0%
Post-endodontic treatment (After 24 hours)	55	25	20	10	110
	50.0%	22.7%	18.2%	9.1%	100.0%
Group-I (Dextrose capsule)	10	20	15	10	55
	18.2%	36.4%	27.3%	18.2%	100.0%
Group-II (Prednisolone)	45	5	5	0	55
	81.8%	9.1%	9.1%	.0%	100.0%
P-value	<0.001*				

placebo drug after pulpectomy^{13,22,23,24}.

The outcome of this study states that the use of oral prednisolone pre-operatively reduced the pain significantly in patients after 24 hrs endodontic treatment. Elkhadem and his colleagues reported that pretreatment use of a single dose of oral prednisolone was effective to regulate post-endodontic pain in patients by 30% after 24 hrs in earlier symptomatic patients²⁵. Claffey et al²⁶, reported pain relief after 24 hrs which correspond to this study.

An other study conducted at Cairo University, Egypt, to analyse the effect of premedication with prednisolone on post-endodontic pain also affirms our results by stating that patients who received oral dose of prednisolone (40 mg) pre-operatively experienced reduction in pain 6 hours postoperatively²⁷.

The analysis made in other clinical trials regarding the comparison of the efficacy of 20mg ketorolac, 30mg prednisone, and placebo (pre-operatively) in endodontic pains, also endorsed. This study by reporting reduced pain with prednisolone than the other two groups after endodontic treatment^{28,29}.

The evaluation of the studies, in which other prepara-

tions of corticosteroids were used before the initiation of endodontic in symptomatic patients, demonstrated the reduction in pain after the procedure, compared to those patients who received placebo. These outcomes are in agreement with this analysis^{13,16, 30}.

The administration of prednisolone by different routes, in patients before the initiation of endodontic treatments proved to decrease the pain after endodontic procedures^{3,31,32,33,34}, whereas, the oral administration of the steroidal anti-inflammatory drug reported to be more beneficial and effective³⁵.

CONCLUSION:

Use in endodontic treatment has showed prednisolone resulted in greater resolution of postoperative pain compared to the group which received placebo.

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