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COMPARISON OF 0.5 MG DEXAMETHASONE AND PLACEBO USED AS PREMEDICATION FOR SUCCESS OF INFERIOR ALVEOLAR NERVE BLOCK

[1]MUHAMMAD AHMED, [2]ASIF NOOR, [3]ROMANA NOREEN, [4]MUSTAFA SAJID, [5]MUHAMMAD JAMIL, [6]MOHSIN JAVAID

ABSTRACT

In irreversible pulpitis, it is very difficult to achieve local anesthesia which is very frustrating condition for a dentist. Steroids are a most valuable adjunctive to the armamentarium available to health professionals to increase the success rate of inferior alveolar nerve block. Objective of the study was to compare the effects of steroids with placebo before inferior alveolar nerve block for reducing the pain. One hundred and four patients were included from the OPD of Operative Dentistry Department of Multan Dental College. Study subjects were divided into two groups by using random number table. The patients in group A received 0.5 mg tablet of dexamethasone and patients in group B received identical placebo tablet one hour before the administration of a conventional inferior alveolar nerve block. When success rate of inferior alveolar nerve block of group A(dexamethasone) and group B (Placebo) were compared among age groups and gender then it was found that success rate of group A was significantly more than that of group B (Table 1, 2). Conclusion of the study was that use of 0.5mg Dexamethasone showed promising results for the success rate of inferior alveolar nerve block.

Key Words: *Dexamethasone, Inferior Alveolar Nerve Block, Placebo.*

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INTRODUCTION

Reversible pulpitis is considered when mild or moderate pain is present and remained for a while after removal of stimulus. Irreversible pulpitis represents spontaneous and dull pain which remained for a long time after removal of stimulus. If left un-treated, reversible pulpitis can convert into irreversible. Reversible pulpitis, irreversible pulpitis and apical periodontitis are painful conditions when they are in acute phase.[1-4] In irreversible pulpitis root canal therapy is the treatment of choice. In irreversible pulpitis, it is very difficult to achieve local anesthesia which is a very frustrating condition for a dentist. There are several causes about local anesthetic failure which includes anatomic variations, decreased PH due to inflammation, tachyphylaxis, increased nociceptors due to inflammation, change in blood flow due to inflammation, increased central sensitization, and effect of patient psychology.[5] The prostaglandins induced sensitization of peripheral receptor and increased proportions of tetrodotoxin resistant sodium channel are major factors for inferior alveolar nerve block failure.[6,7] Quality of local anesthesia can be improved by using anti-inflammatory drugs which inhibit the prostaglandins. Glucocorticosteroids and non steroidal anti-inflammatory drugs (NSAIDs) can reduce the inflammation. NSAIDs and other anti-inflammatory drugs reduce the inflammation by blocking cyclo-oxygenase enzyme which produces prostaglandins[9].Dentist can use steroids to increase the success rate of inferior alveolar nerve block. In case of irreversible pulpitis endodontic therapy is the treatment of choice. Local or systemic supplement of steroid before endodontic therapy can increase the effect of local anesthesia by reducing the acute inflammation.[10]Objective of the study was to compare the effect

[1] Muhammad Ahmad, BDS, Assistant Professor, Multan Medical and Dental College, Jahangirabad, Multan, Cell: 03317049381, E-mail: Ahmedshafi378@yahoo.com
[2] Asif Noor, BDS, MSPH, Associate Professor, Cell: 03054994700 E-mail: asifnoor14@gmail.com
[3] Romana Noreen, BDS, FCPS, Senior Registrar, Cell: 03217356477
[4] Mustafa Sajid, BDS, FCPS, Associate Professor, House 45, Employees Colony, Layyah. Cell: 03136705216:03000870781 E-mail: mustafa_sajid_@hotmail.com
[5] Muhammad Jamil, BDS, MSC(BRISTOL), FDSRCS(EDINBURG), Professor, Cell: 03337615146
[6] Mohsin Javaid, BDS, MsPH, Senior Lecturer, Cell: 03136521888 E-mail: Mohsinjavaid734@gmail.com
Number 1,2,4,5, 6 are from Multan Medical & Dental College. Author number 3 is from Nishtar Institute of Dentistry, Multan.

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of steroids with placebo before inferior alveolar nerve block for reducing the pain.

MATERIALS AND METHODS

After approval from ethical committee, one hundred and four patients were included from the OPD of Operative Dentistry Department, Multan Dental College, Multan during 6-months period. Informed consent was taken from each patient after describing them the objectives of the study.

Inclusion criteria: Females & males of age 18 to 40 years with symptomatic irreversible pulpitis presenting them within one week after the onset of symptoms were included in the study.

Exclusion criteria: Patients with reversible pulpitis, having past history of allergies and hypersensitivity to or unable to take dexamethasone, pregnant or nursing women, those with a history of significant medical conditions like angina pectoris, diabetes and patients who had taken any analgesics for at least 12 hours before enrollment in the study were excluded from the study.

Study subjects were divided into two groups: Group A with odd numbers and group B with even numbers. The patient in Group A had received 0.5 mg tablet of dexamethasone and patient in group B had received identical placebo tablet one hour before giving inferior alveolar nerve block anesthesia. Successes were defined as no to mild pain (visual analog scale recordings) on pulpal access or instrumentation.

Data were entered and analyzed using computer program SPSS-20. Mean, standard deviation, frequencies and percentages were calculated. Quantitative variables were age, pain score, and duration of symptoms. Both groups were compared by using chi-square test.

Effect modifiers like age, gender, duration of symptoms, were controlled by stratification. Post-stratification chi-square test was applied to see their effects on outcome. A p-value of ≤ 0.05 was taken as statistically significant

RESULTS

Out of 104 patients fifty-eight were males and forty-six were females (Table 1). Patients were divided into two age groups; age group under 30years included 62 patients and other age group over 30 years age contained 42 patients (Table 1). Overall success rate of inferior alveolar nerve block was not significantly different between both age groups and gender groups (Table 1). But when success rate of inferior alveolar nerve block of group A(dexamethasone group) and group B (Placebo group) were compared among age groups and gender. Then it was found that success rate of group A was significantly higher than that of group B (Table 1, Table 2).

DISCUSSION

In this study, Group B was treated with Placebo and the success of the inferior alveolar nerve block in patients with symptomatic irreversible pulpitis was 15%. Fulmar et al. reported the success rate for the IAN (inferior alveolar nerve block) as 28% for the placebo dose. Success rate of inferior alveolar nerve block has been reported as 15-57% in clinical trials.[11] While in this study, success of the inferior alveolar nerve block was 15% for group B and 40% for Group A (Dexamethasone). Shahi et al.[12] reported 13% success rate for placebo group patients.

TABLE 1: SUCCESS RATE OF PATIENTS AMONG GENDER AND AGE GROUPS

Variable	Category	Successful	Unsuccessful	Total	P-Value
Gender	Male	17(29%)	41(71%)	58(55%)	0.716
	Female	12(26%)	34(74%)	46(45%)	
Total	29(28%)	75(72%)	104		
Age	Less than 30 years	17(27%)	45(73%))	62(60%)	0.898
	More than 30 years	12(29%)	30(71%)	42(40%)	
Total	29(28%)	75(72%)	104		

TABLE 2: SUCCESS OF INFERIOR ALVEOLAR NERVE BLOCK AMONG GROUPS AND GENDER

	Group A (Dexamethasone)			Group B(Placebo)			P-Value
	Successful	Unsuccessful	Total	Successful	Unsuccessful	Total	
Male	13(45%)	16(55%)	29(56%)	4(14%)	2(86%).	29(56%)	0.009
Female	8(35%)	15(65%)	23(44%)	4(17%)	19(83%)	23(44%)	0.179
Total	21(40%)	31(60%)	52(50%)	8(15%)	44(85%)	52(50%)	

TABLE 3: SUCCESS OF INFERIOR ALVEOLAR NERVE BLOCK ANESTHESIA AMONG GROUPS AND AGE GROUPS

	Group A (Dexamethasone)			Group B(Placebo)			P-Value
	Successful	Unsuccessful	Total	Successful	Unsuccessful	Total	
Less than 30 years	11(40%)	16(60%)	27(52%)	6(17%)	29(83%)	35(67%)	0.039
More than 30 years	10(40%)	15(60%)	25(48%)	2(12%)	15(88%)	17(333%)	0.047
Total	21(40%)	31(60%)	52(50%)	8(15%)	44(85%)	52(50%)	

In another study, success rate for IAN block was thirty percent in inflamed pulp and seventy percent in uninflamed pulp.[13-17] In normal teeth, success rate for IAN block is seventy-five to ninty-five percent.[18] However, in cases of symptomatic irreversible pulpitis teeth, the rate of failure greatly increases as high as 44%–81%.[19]In present study success rate of inferior alveolar nerve block remained 40% with dexamethasone. Another double-blind randomized control trial disclosed that premedication with dexamethasone could significantly increase the success rate of inferior alveolar nerve block than placebo.[20]

A meta-analysis showed that dexamethasone enhanced the effect of inferior alveolar nerve block (IAN). Present study also showed more success in dexamethasone group.[21] Maryam B also found that dexamethasone increased the success rate of inferior alveolar nerve block.[20]

Parirokh et al and Noguera-Gonzalez et al[22,23] stated that premedication before inferior alveolar nerve block significantly raised the success rate of inferior alveolar nerve block anesthesia.

In another study statistically significant difference was found between success rate of dexamethasone group and placebo group irrelevant to all age groups.[20]

Karapinar-kazandag et al stated that their clinical studies revealed that failure rate of inferior alveolar nerve block was 40 to 90 percent in cases of irreversible pulpitis. In present study 85% patients failed to achieve anesthesia in placebo group. But in dexamethasone group this failure rate decreased to 60% which is similar to other clinical studies and systemic reviews. [24]

In Pakistan many studies have been done on success rate of inferior alveolar nerve block anesthesia with pre-medications. In most of the studies non-steroidal anti-inflammatory drugs were used as drug of choice before inferior alveolar nerve block.[25] But in present study dexamethasone was used as a premedicated drug which showed significant success rate of inferior alveolar nerve block anesthesia.

Nehal[26] concluded that success rate of inferior alveolar nerve block is not significantly affected by preoperative steroids. Results of Nehal's study are contrary to this study because Nehal used smaller sample size for study.

A systemic review and network meta-analysis showed that 0.5mg dexamethasone had significantly improved the success rate of inferior alveolar nerve block.[27] In this study preoperative treatment of steroids showed promising results as compared to placebo.

CONCLUSION

Use of 0.5mg Dexamethasone showed promising results for the success rate of inferior alveolar nerve block.

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CONTRIBUTIONS BY AUTHORS

1 Muhammad Ahmed:	Writer of the article & Data collection
2 Asif Noor:	Literature Search
3 Romana Noreen:	Article Editing
4 Mustafa Sajid:	Data Analysis
5 Muhammad Jamil:	Research Supervisor
6 Mohsin Javaid:	Clinical Assistance