

THE EFFECT OF DEXAMETHASONE ON NEUROPRAXIA FOLLOWING THIRD MOLAR SURGERY

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ABSTRACT

In this double blind controlled study, the effects of intramuscular Dexamethasone on neuropraxia development of inferior alveolar nerve and lingual nerve following the surgical removal of mandibular third molars were studied after 24 hours. Patients who were contraindicated to the use of steroid i.e. hypertensive, GIT ulcer, diabetics, bacterial infections, history of thromboembolic events, psychosis, patients taking other medication chronically and pregnant were excluded from this study. Out of total 200 hundred impactions cases, 100 cases received 8mg intramuscular dexamethasone one hour prior to surgical extraction but it was not given to other 100 cases of control group. The overall rate of paresthesia of lingual nerve was 15% and of the inferior alveolar nerve 6.5%. On comparison no statistical difference in neuropraxia with in the dexamethasone group and control group was noted. P value for lingual nerve was 1.000 and for inferior alveolar nerve 0.390 so both had no significance statistically ($p > 0.05$).

Key words: Neuropraxia, impaction, dexamethasone

INTRODUCTION

Surgical extraction of the impacted third molars can result in various unpleasant sequelae i.e. Post operative swelling, trismus, pain, and nerve impairment.¹ Many other studies have shown, that post operative swelling, trismus and pain can be reduced by per operative use of steroids.^{2,3} Among the most serious and often discussed post operative complication, that arises from 3rd molar surgery is trigeminal nerve injury, specifically involvement of either the inferior alveolar nerve or lingual nerve.⁴ There are three types of peripheral nerve injuries; neuropraxia, axonotmesis, and neurotmesis. Neuropraxia, the least severe form of peripheral nerve injury means temporary failure of conduction in a nerve in the absence of valerian degeneration. There is a contusion of the nerve in which epineural sheath and the axons are maintained. Blunt trauma or traction of a nerve, inflammation around a nerve or local ischemia of a nerve can produce a neuropraxia. Full recovery of the

nerve function usually occurs in a few days or weeks.⁵

Chamani showed the effect of routine oral surgery on salivary cortisol response. According to him cortisol level of saliva raises pre- and post operatively.⁶ Williamson et al. showed initial suppression of normal adrenal gland when dexamethasone was given for oral surgical procedures. The stress caused by molar surgery was insufficient to overcome this suppression, but the presence of sufficient amount of synthetic steroids at a cellular level seemed to prevent any manifestations of adrenal insufficiency.⁷ The anti-inflammatory effect of steroid after oral surgery procedures are well established. Since dexamethasone has been shown to reduce post operative edema, it was decided to investigate the specific effects of dexamethasone on neuropraxia following removal of mandibular 3rd molars as it was felt, that this effect may reduce nerve damage caused by pressure or edema. As dexamethasone showed reduction of swelling after 24 hours post

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operatively, if any effect on neuropraxia is to be observed, it should be seen by this time.

METHODOLOGY

This study was carried out at the Department of Dentistry, Hayat Abad Medical Complex, Peshawar from June 2010 to December 2010. Hundred volunteers took part in this study, who presented themselves for extraction of bilateral impacted 3rd molar teeth. There were 60 males and 40 females with an average age of 18 years. All belonged to middle class families socioeconomically. After taking history and thorough clinical examination periapical x-rays were taken for all selected patients. Patients who were contraindicated to the use of steroid i.e. hypertensive, GIT ulcer, diabetics, bacterial infections, history of thromboembolic events, glaucoma, psychosis, patients taking other medication chronically and pregnant were excluded from study. Both verbal and written consent was obtained from each patient prior to inclusion in the trial.

As all hundred patients were having bilaterally impacted mandibular third molars, therefore in each individual molar of one side was randomly assigned to the study group and the other side to the control series each consisting of hundred impaction cases. The study group received 8 mg dexamethasone intra muscularly one hour before surgery, while the control received no such medication. Extractions of the both bilateral impacted teeth (one side study group and other side control group) of same patient were carried out at six weeks apart. All patients were operated by a single surgeon. In most of the procedures, ostectomy with tooth sectioning were performed.

All patients were enquired 24 hours post operatively regarding altered sensation with in the distribution of inferior alveolar nerve and lingual nerve. The question was asked by an operator who had not performed the surgery and who was unaware as to which treatment group the patient belonged. Any alteration in the sensation described by the patients, usually as tingling or pins and needles; was recorded. No patient reported an area of total anesthesia post operatively and so no further investigations were undertaken.

TABLE 1: INCIDENCE OF PARESTHESIA AFTER 24 HOURS POST OPERATIVE

	Control group	Study group	P value
Total no of cases	100	100	
Normal sensation	80 (80%)	77 (77 %)	0.606
Lingual paresthesia	15 (15%)	15 (15%)	1.000
Inferior alveolar nerve Paresthesia	5 (5%)	8 (8%)	0.390

RESULTS

Among the 100 patients of bilaterally mandibular impacted molars, there were 60 males and 40 females. The mean age was 20 years. Total of 200 surgical extractions were done, 100 in control group and 100 in dexamethasone study group.. The numbers reported paresthesia of these nerves is shown in Table 1.

The overall rate of paresthesia of lingual nerve was 15% and of the inferior alveolar nerve 6.5%. On comparison no statistical difference in neuropraxia with in the dexamethasone group and control group was noted. P value for lingual nerve was 1.000 and for inferior alveolar nerve was 0.390 so both have no significance statistically ($p > 0.05$). Almost all of the cases resolved within one week postoperatively. The remaining few reported steady improvement over the ensuing weeks. No one among these patients reported anesthesia (total numbness) of the inferior alveolar nerve or lingual nerve.

DISCUSSION

This study has provided an opportunity to assess the effect of steroids to prevent neuropraxia development after third molar surgery. The anti-inflammatory effect of steroid after oral surgical procedure is well established. Since dexamethasone has been shown to reduce post operative edema, it was decided to investigate the specific effect of dexamethasone on neuropraxia following removal of mandibular third molars as it was felt that this effect may reduce nerve damage caused by pressure or edema.

Paresthesia of the inferior alveolar nerve affected 5% of the patients in control group and 8% in the study group in this trial. This figure is comparable to other reported series: Jarjes W⁴ (4.1%), Kipp et al.⁹ (4.4%),

and Rood¹⁰ (7.5%). Paresthesia of the lingual nerve affected 15% of the patients in this study in both groups. This figure is much different from the reports of Jarjes W¹¹ (1.8%), Blondeau F¹² (.92%), Contar CMM¹³ (.84%) and Rood¹⁰ 6.6%, but these cases were noted at between 2 to 6 months after surgery when the vast majority of our reported cases of paresthesia had already resolved. The result of this study are comparable with the report of Mason DA¹⁴ (11.5%), as he noted neuropraxia after 2 weeks of surgery. In this double blind controlled clinical trial it has become clear that the administration of 8 mg dexamethasone, intramuscularly, 1 hr before operation did not have any significant effect on neuropraxia of the inferior alveolar nerve and lingual nerves.

Dexamethasone at a dosage known to reduce swelling, pain and trismus failed to reduce neuropraxia. Further investigations to assess the effects of a larger dose of dexamethasone on neuropraxia are needed. This study failed to demonstrate any immediate advantage in using steroids, however their routine use may be considered because of the reduction of other unwanted sequelae. Side-effects of their use are minimal, and in the healthy patient make the post operative period much less unpleasant.

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