ORIGINAL ARTICLE

EFFICACY OF GREATER AURICULAR NERVE INFILTRATION ANESTHESIA IN PATIENTS HAVING LESS THAN OPTIMAL ANALGESIA AFTER CONVENTIONAL INFERIOR ALVEOLAR NERVE BLOCK FOR SURGICAL REMOVAL OF MANDIBULAR THIRD MOLAR

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ABSTRACT

The aim of this study was to determine efficacy of greater auricular nerve infiltration anesthesia in patients having less than optimal analgesia after conventional inferior alveolar nerve block for surgical removal of mandibular third molars particularly those fallig in category calss 2, position B and C. It was a Quasi-Experimental study done in Minor Oral Surgery Department at Armed Forces Institute of Dentistry, Rawalpindi from 19th August 2010 to 10th June 2011. Conventional inferior alveolar nerve block was given to 40 patients. Out of these 14(35%) patients had no pain while 26(65%) experienced pain in the angle of mandible area. These 26 patients were given greater auricular nerve infiltration which relieved pain in 21 patients (80.8%) while 5(19.2%) patients remained symptomatic (p= 0.007). Based on this study it was concluded that intraoperative analgesia is enhanced by greater auricular nerve infiltration in patients complaining of less than optimal analgesia after conventional inferior alveolar nerve block during mandibular third molar surgery.

Key words: *Mandibular third molars, greater auricular nerve anesthesia*

INTRODUCTION

Mandibular third molars are the most frequently impacted teeth in human and surgical extractions have become most common dentoalveolar surgery.[18] Many impacted teeth remain asymptomatic for years but in many cause problems and often need removal. Many patients complain of pain during their surgical removal. Pain ranges from mild to severe depending upon the pattern and position of impacted mandibular third molar. Complications related to their removal range from 4.6% to 30.9%, and may occur intraoperatively or develop in the postoperative period.[19] Intraoperative pain is mainly due to inefficacy of conventional inferior alveolar nerve block. Infiltration anesthesia at other nerve areas may enhance the analgesia.

METHODOLOGY

This study was carried out on 40 patients between the ages of 20 to 40 years at Minor Oral Surgery Department of Armed Forces Institute of Dentistry, Rawalpindi from 19th August 2010 to 10th June 2011. These were scheduled to undergo surgical removal of mandibular third molar (class 2, position B and C) under local anesthesia. After giving local anesthesia (lignocane2% in 1:100,000 adrenaline) three cornered mucoperiosteal flap was elevated. Patients specifically complaining of pain in the angle of mandible area during surgery after reflecting flap were given greater auricular nerve infiltration (2% lignocaine solution with 1:100,000 adrenaline) lateral to ramus and medial to masseter muscle intraorally. Pain was evaluated by VAS criteria after giving GAN infiltration. Measure-

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ments were taken at base, one minute, 5 minutes and 10 minutes.

Data were analyzed using SPSS (Version 17) statistical software package. Mean and standard deviation was measured for age, time of surgical procedure and number of local anaesthesia cartridges. Frequencies/ percentages were computed for gender and pain. Chi-square was used to compare pain. p-value < 0.05 was considered significant. Out of 26 patients 21 patients reported no pain after one to 10min of greater auricular infiltration, with a significant p-value of 0.007, Table 4. The null hypothesis would be "there is no effect" H_o.

RESULTS

This study comprised 40 patients. There were 19 (47.5%) males and 21 (52.5%, Table 1). Females age ranged from 19 years - 40 years (28.85±5.323). Time of surgery ranged from 30 minutes to 45 minutes (40.75±5.834). Number of local anesthesia cartridges used ranged from 2 to 3 (2.58±0.501, Table 2).

TABLE 1: GENDER DISTRIBUTION

Gender	Frequency	Percent
Male	19	47.5
Female	21	52.5
Total	40	100.0

TABLE 2: AGE, TIME AND NUMBER OF CARTRIDGES USED

Variable	n	Minimum	Maximum	Mean	Std. deviation
Age of the patients	40	19	40	28.85	5.323
Time of surgery in minutes	40	30	45	40.75	5.834
Number of LA cartridges	40	2	3	2.58	0.501

TABLE 3: REASONS FOR REMOVAL

Reason for extraction	Frequency	Percent
Irreversible pulpitis/ grossly carious	7	17.5%
Recurrent pericoronitis	30	75.0%
Orthodontic purpose	3	7.5%

Reasons for removal and pain evaluation are given in Table 3 and 4

TABLE 4: PAIN EVALUATION

Name of Nerve Block	n	No pain	Pain	p-value
Conventional Block	40	14 (35.0%)	26 (65.0%)	0.007
Conventional Block & Greater Auricular Nerve Infiltration	26	21 (80.8%)	5 (19.2%)	

DISCUSSION

The key to successful facial nerve block is familiarity with neuroanatomy and anatomic landmarks. Regional nerve block anesthesia alone is not adequate to provide full and profound anesthesia for full-face.[1-3] The trigeminal nerve (cranial nerve-V) is the main sensory innervations to the face. Its 3 branches originate at the gasserian ganglion and include the ophthalmic nerve (V-1), maxillary nerve (V-2), and mandibular nerve (V-3).The primary sensory supply of the head and neck is through these three branches of the trigeminal nerve except the angle of mandible which is supplied by the greater auricular nerve (cervical nerve roots C2-C3).[4-5] The clinical significance of this nerve is apparent in some patients undergoing lower third molar surgery under local anaesthesia requiring a separate infiltration to achieve total analgesia of the region.[6]

The great auricular nerve (GAN) is a superficial branch of the cervical plexus that provides sensory innervation to the skin overlying the parotid gland, external ear and posterior auricular region.[7] The cervical plexus lies deep to the sternocleidomastoid muscle.[6] It is formed by the ventral primary rami of the first four cervical nerves. Each rami gives a superior and inferior branch. The deep nerves give off more superficial cutaneous branches that are the lesser occipital nerve, the greater auricular nerve, the suprascapular nerves and smaller cutaneous branches. The deep cervical plexus gives motor supply to the deep musculature of the neck.[7] The superficial branches merge from behind the midpoint of the sternocleidomastoid muscle (Erb's point) to supply the overlying skin of the neck from the base of the skull to the clavicle.[8]

Surgically difficult extractions like class 2, 3 in position B, C usually requires GA for extraction according to the literature.[9,10] We experienced that during extraction of these teeth the use of conventional inferior alveolar nerve block along with buccal and lingual

nerve block, one third of patients suffer moderate to severe intraoperative pain as a result of inadequate analgesia specifically at the angle of mandible area. To test our hypothesis: "Could infiltration of greater auricular nerve area in patients having less than optimal analgesia after conventional inferior alveolar nerve block further improves the analgesia," we present a safer, more efficient and more effective technique utilizing a combination of regional nerve block and local infiltration anesthesia. This combination provides a pain-free procedure while avoiding the risks of intravenous sedation or general anesthesia. It is a more cost effective and a less demanding procedure than general anesthesia. It is an original study regarding intraoral greater auricular infiltration anesthesia during third molar extraction. Other studies in literature are related to extraoral approach of the GAN block includes tympanomastoid surgery or awake craniotomy and patients undergoing otoplasty.[11,12]

In the early days of general anesthesia, local anesthesia was preferred due to the significant risks associated with general anesthesia. regional anesthesia has many advantages as the patient is conscious during surgery maintaining his own airway, contain his own gastric secretions, and warn the surgeon of complications. Patients usually have a smooth postoperative course with shorten recovery times. There is the elimination of painful afferent stimuli of the operative site and the blockade of efferent sympathetic nerves to endocrine glands that eliminates the postsurgical metabolic endocrine changes. Finally, local anesthesia is less expensive thus, the trend to extract mandibular third molar under general anesthesia is becoming less common.[13] It may cost the surgeon the luxury to operate quickly as in the setting of office sedation/anesthesia. If the complication rate was inûuenced by the need for speed, one would expect to see little difference between the general anesthesia and local anesthesia group.[14] The role of opioids for pain control in day case surgery is also controversial because of their side effects, especially nausea, vomiting respiratory depression, somnolence and itching which can be avoided by giving proper analgesia through regional nerve blocks and infiltration.[15-18]

Based on the above mentioned observations, it is concluded that whenever deep impactions are to be surgically removed under local anaesthesia intraoperative greater auricular nerve infiltration in patients complaining of less than optimal analgesia after conventional inferior alveolar nerve block, can help us avoid GA. Further studies are however required on large sample of patients to demonstrate the efficacy of intraoral greater auricular nerve infiltration during this surgery.

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