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Evaluate and Compare Anaesthetic Efficacy of 75% Ropivacaine and 5% Bupivacaine on the Perioperative Regional Anaelgesia in Impacted Mandibular Third Molar Surgery

Author's name: Ankita Raj- Professor, Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh

Co-author's name:
Dr. Vivek Singh Chauhan- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh
Dr. V. Santhosh Kumar- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh
Dr. Himanshu Gupta- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh.
Dr. Aathira Madhu- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh
Dr.Tuba Jamal- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh
Dr. Akash Tiwari- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh
Dr. Ayushi Agarwal- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh
Dr. Pulkit Advani- Post Graduate Resident , Department of OMFS, Rama Dental College Hospital and Research Centre, Rama University, Kanpur, Uttar Pradesh

Abstract:-

➢ ***Background***

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Mild to severe pain may be experienced during oral surgical procedures which may be abolished using various analgesics and local anesthetic agents of varying concentration. The management of patient's pain, both intra and post operatively, is one of the pivotal goal in treatment of patients with impaction due to its persistent moderate or severe pain concerning its intensity.

➢ ***Aim***

To evaluate anesthetic potencies of 0.75% ropivaciane and 0.5% bupivacaine , as well as their influence on hemodynamic parameters in the impacted third molar surgeries.

➢ ***Materials and methods***

This study was carried out on patients who visited department of Oral and Maxillofacial Surgery , Rama Dental College, Hospital And Research Centre Kanpur. 50 subjects who fulfilled inclusion and exclusion criteria were arbitrarily selected, using lottery system to receive either .75% ropivacaine in group I and .5% bupivacaine in group II . the results were noted and compared

➢ ***Results***

Post operatively mean systolic pressure was lesser in group B while mean diastolic pressure was lesser in group B. Post operative pulse rate decreased in group A while increased in group B and the onset of action was lesser in group B. The success rate of anesthesia was significantly more in ropivacaine. On comparison of quality of anesthesia score 23 of group A and 18 in group B showed quality 1, 2 of group A and 6 in group B showed quality 2 while none in group A and 1 in group B showed quality 4. In group A, 19 had mild, 6 has moderate and none had severe bleeding while in group B, 7 had mild, 15 has moderate and 3 had severe bleeding. While comparing intra-operative bleeding mean percentage was 0.36 in group A and 1.16 in group B. Duration of anesthesia showed a mean percentage of 469.68 in group A and 371.12 in group B.

➢ ***Conclusion***

This study states that ropivacaine provides successful and higher rate of local anesthesia than bupivacaine by providing faster onset of anesthesia, greater depth of anaesthesia, grater duration of anesthesia, lesser intra operative pain and bleeding.

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I. INTRODUCTION

International Association For Study Of Pain (IASP) defined pain as " an unpleasant sensory and emotional experience associated with actual or potential tissue damage." Mild to severe pain may be experienced during oral surgical procedures which may be abolished using various analgesics and local anesthetic agents of varying concentration. the management of patient's pain, both intra and post operatively, is one of the pivotal goal in treatment of patients with impaction due to its persistent moderate or severe pain concerning its intensity(1,2).local anesthetics may be classified as short acting (eg. Procaine, lidocaine) and long acting (eg ropivacaine ,bupivacaine)(3). Efficacy of local anesthetic solution is characterized by its rapid onset of action and intermediate duration of action. surgical trauma and inflammation sensitive nocciceptive receptors from where neural impulse take post – operative period of 8 -12 hrs through which maximum pain intensity is achieved. Thus, longer acting local anesthetic agents are finer in controlling post operative pain as compared to short acting local anesthetic agents.(4,5). Bupivacaine is one of the most known long acting amide type local anesthetic with onset time of 1- 15 min and duration of action of 4 – 9 hrs. the major advantage of bupivacaine is its extended period of analgesia after the return of normal sensations which reduces the need of post operative analgesics(6)however it is cardiotoxic and arrhythmogeic when administered in higher doses or accidentally via intra vascular route (7) thus there was a need for pharmacologically safer long acting local anesthetic as dynamic as bupivacaine, hence ropivacaine was developed.(8,9) . ropivacaine is a long acting amide type local anesthetic with rapid onset of 1.5 to 3 mins and duration of action of 8-9 hrs. it was introduced as successor of bupivacine in terms of onset, duration, reduced toxicity to CNS and CVS however question arises regarding its overall anesthetic potency for use in oral surgery . Interestingly the anesthetic evaluation of ropivacaine and bupivacaine in the elimination of pain associated with surgical removal of impacted mandibular third molar has not been exhaustively studied in patients. Hence , the purpose of this study is to evaluate anesthetic potencies of 0.75% ropivaciane and 0.5% bupivacaine , as well as their influence on hemodynamic parameters in the impacted third molar surgeries.

II. AIMS AND OBJECTIVES

- *Aim:* to evaluate anesthetic potencies of 0.75% ropivaciane and 0.5% bupivacaine , as well as their influence on hemodynamic parameters in the impacted third molar surgeries

- *Objectives:*

- To assess any hypersensitivity reaction associated with local anesthetic solution
- To Ascertain onset time of action
- To assess Quality of local anesthesia
- To assess Duration of action
- To assess Intensity of intra operative pain
- To assess Intensity of intra operative bleeding
- To Measure blood pressure and pulse rate pre and post operatively

III. MATERIAL AND METHODS

This study was carried out on patients who visited department of Oral and Maxillofacial Surgery , Rama Dental College, Hospital And Research Centre Kanpur. 50 subjects who fulfilled inclusion and exclusion criteria were arbitrarily selected, using lottery system to receive either .75% ropivacaine in group I and .5% bupivacaine in group II . the results were noted and compared

- *Inclusion Criteria*

- All patients having impacted third molars
- All patients in age group of 25-50 yrs
- Patients medically fit for surgery

- *Exclusion Criteria*

- Patients allergic to any local anesthetic agent prescribed in study
- Pregnant or lactating mothers
- Medically compromised patients
- Subjects unwilling to comply with protocol
- Subjects not giving consent for the study

IV. RESULTS

Table 1: Comparison Of Preoperative Blood Pressure

Groups	Number of subjects	Mean systolic pressure	Mean diastolic pressure
Group A (Ropivacaine)	25	126.28	81.72
Group B (Bupivacaine)	25	128	82.16

Table 2: Comparison of Postoperative Blood Pressure

Groups	Number of subjects	Mean systolic pressure	Mean diastolic pressure
Group A (Ropivacaine)	25	126.4	82.32
Group B (Bupivacaine)	25	125.32	85.44

Table 3 : Comparison of Pre Operative & Post Operative Pulse Rate

Groups	Number of subjects	Mean pre Operative pulse rate	Mean post Operative pulse rate
Group A (Ropivacaine)	25	76.4	73.9
Group B (Bupivacaine)	25	77.2	82.6

Table 4 : Comparison Of Onset Of Action

Groups	Number of subjects	Mean time of onset(minutes)
Group A (Ropivacaine)	25	2.21
Group B (Bupivacaine)	25	3.15

Table 5 : Comparison Of Success Rate Of Anesthesia

Groups	Number of subjects	Mean (%)
Group A (Ropivacaine)	25	95.6
Group B (Bupivacaine)	25	87.56

Table 6 : Comparison of Quality of Anesthesia Score (QRS)

QUALITY	Group A (Ropivacaine	Group B (Bupivacaine	TOTAL
1	23	18	41
2	2	6	8
4	0	1	1
TOTAL	25	25	50

Table 7 : Comparison of Quality of Intra Operative Bleeding (VDS)

QUALITY	Group A (Ropivacaine	Group B (Bupivacaine	TOTAL
MILD	19	7	26
MODERATE	6	15	21
SEVERE	0	3	3
TOTAL	25	25	50

Table 8 : Comparison of Intra Operative Bleeding (VAS)

Groups	Number of subjects	Mean (%)
Group A (Ropivacaine)	25	.36
Group B (Bupivacaine)	25	1.16

Table 9 : Comparison of Duration of Anesthesia

Groups	Number of subjects	Mean (%)
Group A (Ropivacaine)	25	469.68
Group B (Bupivacaine)	25	371.12

V. DISCUSSION

Pain is most commonly experienced symptom during extraction.both, bupivacaine and ropivacaine are long acting amide type of local anesthetics. This study demonstrates the magnitude of more successful local anesthetics in the surgery of mandibular third molar, and an analgesic efficacy of .75% ropivacaine compared to .5% bupivacaine. In present study there were no significant changes in mean systolic blood pressure ore and post operatively in both the groups however mean diastolic pressure and pulse rate was elevated in group B as compared to group B postoperatively . mean time of onset in the present study was least in group A (2.21mins) as compared to group B (3.15 mins). Duration of action was longer for .75% ropivacaine compared to .5% bupivacaine. In this study interventions were performed with minimum pain, with full achieved effectiveness of local anesthesia with ropivacaine in 95.6% of patients while in 87.56% of patients with bupivacaine. Quality of anesthesia score obtained in this study was between 1 and 2 in both the groups.

VI. CONCLUSION

This study summarizes the unbiased direct comparison of .75% ropivacaine and .5% bupivacaine. From the results and discussion, this study states that ropivacaine provides successful and higher rate of local anesthesia than bupivacaine by providing faster onset of anesthesia, greater depth of anaesthesia, grater duration of anesthesia, lesser intra operative pain and bleeding.

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