

## Original Research

### A comparative study of the efficacy of bupivacaine versus lignocaine local anesthetic agent in preventing post-operative pain in single sitting endodontic treatment

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#### ABSTRACT:

**Background:** Postoperative pain control is frequently performed with the administration of short-acting local anesthetic and oral analgesics. The present study compared the efficacy of bupivacaine versus lignocaine local anesthetic agent in preventing post-operative pain in single sitting endodontic treatment. **Materials & Methods:** The present study was conducted on 80 patients requiring endodontic treatment of maxillary anterior teeth of both genders. Patients were divided into 2 groups of 40 each. Group I patients was administered lidocaine (2% with 1:100000 epinephrine) local anesthesia and the group II with bupivacaine (0.5% without epinephrine). **Results:** The mean VAS before treatment in both group was 6, after 2 hours was 5.1 in group I and 5.1 in group II, at 6 hours was 4.9 in group I and 4.6 in group II, at 8 hours was 4.5 in group I and 3.2 in group II, at 12 hours was 3.8 in group I and 2.8 in group II, at 24 hours was 2.9 in group I and 2.2 in group II, at 48 hours was 2.5 in group I and 1.4 in group II. The difference was significant ( $P < 0.05$ ). **Conclusion:** Bupivacaine 0.5% used in infiltration anesthesia could be more effective in reduction or prevention of post-operative endodontic pain compared with lidocaine.

**Key words:** Anesthesia, Bupivacaine, lignocaine.

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#### INTRODUCTION

An objective of endodontic therapy is to relieve and/or prevent patient pain. Good anesthetic technique can considerably eliminate pain during treatments; but, post-treatment endodontic pain remains a significant predicament.<sup>1</sup> Postoperative pain control is frequently performed with the administration of short-acting local anesthetic and oral analgesics. Theoretically, pain control can be increased by using a local anesthetic with prolonged action.<sup>2</sup>

The perceived association of pain with endodontic therapy is a great source of fear for many patients and can prevent them from seeking treatment. Controlling post-operative pain represents a meaningful challenge to many practitioners. Local anesthetics provides adequate pain

relief for the majority of dental treatments, however, failures do occur. These may be the result of anatomical, pharmacological, pharmaceutical, pathological, psychological or technical or iatrogenic factors.<sup>3</sup>

Bupivacaine, a long-acting anesthetic, demonstrates a duration of anesthesia ranging between 7 and 11 h for inferior alveolar nerve block and a mean of 9 h for infiltration. Hypothetically, this extended duration of anesthesia covers the time of greatest incidence and intensity of postoperative pain following endodontic therapy. Lidocaine, the first commercialized amide local anesthetic, is still the most widely used anesthetic in some countries. It is considered as a reference for new local anesthetics.<sup>4</sup> The present study compared the efficacy of bupivacaine versus lignocaine local anesthetic agent in

preventing post-operative pain in single sitting endodontic treatment.

**MATERIALS & METHODS**

The present study was conducted in the department of Endodontics. It comprised of 80 patients requiring endodontic treatment of maxillary anterior teeth of both genders. Ethical clearance was taken prior to the study. All patients were informed and written consent was obtained.

General information such as name, age, gender etc was recorded. Patients were divided into 2 groups of 40 each. Group I patients was administered lidocaine (2% with 1:100000 epinephrine) local anesthesia and the group II with bupivacaine (0.5% without epinephrine). The pain in patients was compared using the visual analogue scale (VAS) at definite times i.e. before treatment, during treatment and 2, 6, 10, 12, 24, 36 and 48 hours after root canal treatment. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Graph I Distribution of patients**

Total- 80		
Groups	Group I (Lignocaine)	Group II (Bupivacaine)
Number	40	40

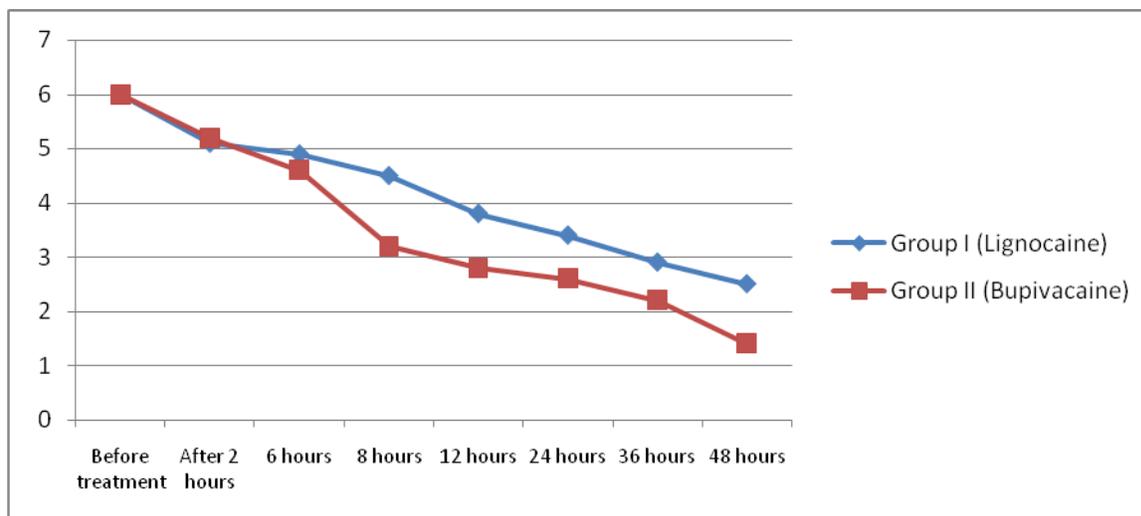
Table I shows that group I patients was administered lidocaine (2% with 1:100000 epinephrine) local anesthesia and the group II with bupivacaine (0.5% without epinephrine). Each group had 40 patients each.

**Table II Comparison of pain on VAS in both groups**

Time	Group I (Lignocaine)	Group II (Bupivacaine)	P value
Before treatment	6	6	0.01
After 2 hours	5.1	5.2	
6 hours	4.9	4.6	
8 hours	4.5	3.2	
12 hours	3.8	2.8	
24 hours	3.4	2.6	
36 hours	2.9	2.2	
48 hours	2.5	1.4	

Table II, graph I shows that mean VAS before treatment in both group was 6, after 2 hours was 5.1 in group I and 5.1 in group II, at 6 hours was 4.9 in group I and 4.6 in group II, at 8 hours was 4.5 in group I and 3.2 in group II, at 12 hours was 3.8 in group I and 2.8 in group II, at 24 hours was 2.9 in group I and 2.2 in group II, at 48 hours was 2.5 in group I and 1.4 in group II. The difference was significant (P< 0.05).

**Graph I Comparison of pain on VAS in both groups**



## DISCUSSION

Bupivacaine, an amide-type local anesthetic, provides prolonged analgesia and is indicated when post-operative pain is anticipated. Its use in routine oral surgery is especially justified for lengthy surgical procedures or oral surgical extraction associated with predicted post-operative pain and discomfort. There are many studies on effectiveness and efficient use of bupivacaine for controlling pain after various types of surgery.<sup>5</sup> Many studies on patients undergoing surgical removal of impacted third molar showed that bupivacaine significantly decreased postoperative pain and the need for the analgesic drugs compared to short-acting anesthetics. It was hypothesized that long acting anesthetic like bupivacaine would cause effective anesthesia at time of treatment and also would be effective in controlling post-operative pain.<sup>6</sup> The present study compared the efficacy of bupivacaine versus lignocaine local anesthetic agent in preventing post-operative pain in single sitting endodontic treatment.

In present study, group I patients was administered lidocaine (2% with 1:100000 epinephrine) local anesthesia and the group II with bupivacaine (0.5% without epinephrine). Each group had 40 patients each. Corbett et al<sup>7</sup> conducted a study to evaluate the efficacy of a long acting anesthesia, bupivacaine, on preventing post-operative pain associated with endodontic treatment, and to compare it with lidocaine. Bupivacaine significantly decreased postoperative pain compared to lidocaine. Postoperative pain was directly related to preoperative pain. Women reported more pain, though significant difference in postoperative pain report was not found between different ages.

We found that mean VAS before treatment in both group was 6, after 2 hours was 5.1 in group I and 5.1 in group II, at 6 hours was 4.9 in group I and 4.6 in group II, at 8 hours was 4.5 in group I and 3.2 in group II, at 12 hours was 3.8 in group I and 2.8 in group II, at 24 hours was 2.9 in group I and 2.2 in group II, at 48 hours was 2.5 in group I and 1.4 in group II.

Brunetto et al<sup>8</sup> found that a total of fifty patients with symptomatic irreversible pulpitis were selected to be included in the study. The patients were randomly divided into two groups: Group A patients were given lignocaine as local anesthetic and Group B were given bupivacaine. The mean overall postoperative pain for bupivacaine was lesser than that for lignocaine, and the difference was statistically significant.

In a study by Davis et al<sup>9</sup>, the researchers found that 0.5% bupivacaine with 1:200,000 epinephrine when used for inferior alveolar nerve block for first or second

mandibular molars had lesser pain score at 6 and 12 h after RCT compared with patients who received 2% lidocaine with 1:80,000 epinephrine, and the use of analgesics was lower than in the lidocaine group. Crout<sup>10</sup> found that the level of postoperative pain was higher in lignocaine group compared to the bupivacaine group. The level of pain in lignocaine group had decreased by 24 h whereas in bupivacaine group, it had decreased by 6 and 12 h after root canal therapy.

## CONCLUSION

Authors found that bupivacaine 0.5% used in infiltration anesthesia could be more effective in reduction or prevention of post-operative endodontic pain compared with lidocaine.

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