Efficacy of Topical Lignocaine Spray and Gel in the Management of Pain While Delivering Inferior Alveolar Nerve Block

Dr. Jayant Verma[1*], Dr. S. Gokkulakrishnan[2], Dr. Archana Chaurasia[3], Dr. Jitendra Diwakar[4]

[1]Junior Resident, Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences Bareilly Uttar Pradesh, India.

[2]HOD, Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences Bareilly Uttar Pradesh, India.

[3]Reader, Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences Bareilly Uttar Pradesh, India.

[4]Senior Lecturer, Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences Bareilly Uttar Pradesh, India.

ABSTRACT

Objective: This study investigates pain relief using topical anesthesia spray vs gel while delivering the classical inferior alveolar nerve block technique during mandibular extraction.

Method: An observational study was conducted in May 2024 involving 122 patients undergoing dental procedures requiring IANB. Before giving the IANB, a topical spray or gel was used on the needle insertion site and the pain score of the patient was noted using the VAS scale. Secondary outcomes included variations in onset times related to patient demographics, anatomical factors, and the experience level of the clinician.

Result: In our study in Group 1 mean pain score was 2.92 ± 0.75 and in Group 2 mean pain score was 1.63 ± 0.66. The mean pain score was less in Group 2 as compared to Group 1 and the mean pain score difference was 1.29. There was a significant difference in the mean pain score between Group 1 and Group 2.

Conclusion: Patients reported less pain during the injection prick when lignocaine spray was applied as opposed to lidocaine gel. By avoiding uncomfortable inferior alveolar nerve blocks and lowering patient anxiety, this study implies that lignocaine spray may be useful in delivering anesthetic as a preventative measure for anxiety and pain.

Keywords: IANB, Lignocaine, Mandibular Extraction, Topical spray.

Address of Corresponding Author

Jayant Verma; Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences Bareilly Uttar Pradesh, India.

E-mail: jayant.verma009@gmail.com

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Introduction

It is a hard and unpleasant operation to inject local anesthetic into a patient. Furthermore, the most important component of oral surgery is pain management. By adjusting the local anesthetic solution's pH and temperature as well as slowing down the injection rate into the tissues, we can get around the problem of injection discomfort.[1] Another method is surface anesthetic, which involves topical, transcutaneous electrical nerve stimulation (TENS), and chilling of the tissues prior to injection.

In dentistry, it is standard practice to combine topical anesthetic with IANB to enable efficient pain management during specific dental operations. Few studies assert that topical anesthetics significantly reduce LA injection pain. A randomized clinical trial by Cho et al. stated that highly anxious participants reported higher pain scores, however, topical anesthetic agents reduced the effect of anxiety and pain on needle insertion pain.[2]

Topical anesthetic gels and sprays are widely accessible and do not require special handling skills. The "holy grail" of painless local anesthetic techniques in dentistry is hence topical anesthetic gel or ointment.[3]

They are able to cause analgesia by penetrating the oral mucosal membrane. They produce surface anesthesia for a depth of 2-3 mm by preventing signals from the sensory nerves' terminal fibers from conduction.[4] This modification occurs as a result of a shift in transmission via voltage-sensitive sodium channels, which raises the action-potential threshold. This characteristic of topical anesthetic makes it possible for it to successfully reduce needle insertion pain. The most widely used topical anesthetic agent (Gold Standard) is lignocaine, which is followed by benzocaine.[5] Hence this study was done to find out the efficiency of topical gel and spray form in the management of pain while giving inferior alveolar nerve block.

Material and Method

This study was conducted in the Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences, BIU, Bareilly. 122 patients were selected from the outpatient flow of the department and will be divided randomly into 2 groups which will be further classified into subgroups according to age. Lignocaine in 15% will be used in spray form in one group and 2% in gel form and 2nd group.

Inclusion Criteria

1. Healthy adult patients
2. Age groups of 18 to 80 years require extraction.

Exclusion Criteria

1. Patients allergic to lignocaine
2. Severe Peri-apical infections
3. Systemic conditions contraindicating extraction
4. H/O Adverse drug interactions of lignocaine

Methodology

The 122 selected patients were divided randomly into 2 groups which were then subclassified according to their age.

Group I: From age group 18-30
Group II: From age group 31-50
Group III: From age group 51-70
Group IV: From age group 70 plus

Group 1 consisted of patients in which topical gel was used and in group 2 topical spray was used. Multiple operators who had received training on how to position the needle insertion carried out the experiment. Because they were instructed to cover their eyes while topical anesthesia was being administered, the subjects were blind to the formulations used. Each subject was kept upright throughout the experiment, and the helper held the suction tip to keep any topical anesthetics from being swallowed. Prior to applying topical anesthesia. Random applications of either 2% lidocaine gel or 15% lidocaine spray were made to the pterygomandibular area on either side. Short needle gauge 26 was used to insert the needle. The VAS was used to record the participant's rating of the level of discomfort experienced during needle insertion.

Assessment Protocol

All the patients were reviewed for complications in terms of pain during injection prick.

Pain

The Visual Analogue Scale (VAS) (McCormack et al., 1988) is used to quantify pain intensity. It comprises ten scales, with 0 denoting no pain at all and 10 denoting the most severe pain a patient has ever experienced. Each subject used a 10-point visual analogue scale (VAS) to rate the amount of pain they experienced during the injection. For every patient, a pain score was taken.

Result

In our study out of 62 cases in group 1, 27.4% cases were in the age group of 18-30 years,29.0% cases were in the age group of 31-50 years,22.6% cases were in the age group 51-70 years and

21.0% cases were in the age group of >70 years and Group2, 26.7% cases were in the age group of 18-30 years, 28.3% cases were in the age group of 31-50 years, 23.3% cases were in the age group of 51-70 years and 21.7% cases were in the age group of 70 years, The mean age of cases in Group 1 was 22.6 ± 4.6 years and in Group2 was 22.6 ± 4.6 years, No obvious distinction was seen in age group of cases in between group 1 and Group2.

Table-AGE GROUP (in years) Distribution.

	GROUP 1		GROUP 2		P-Value
AGE GROUP (in years)	**Number**	**Percentage%**	**Number**	**Percentage%**	
18-30	17	27.4	16	26.7	**0.999#(not significant)**
31-50	18	29.0	17	28.3	
51-70	14	22.6	14	23.3	
>70	13	21.0	13	21.7	
Total	62	100.0	60	100.0	

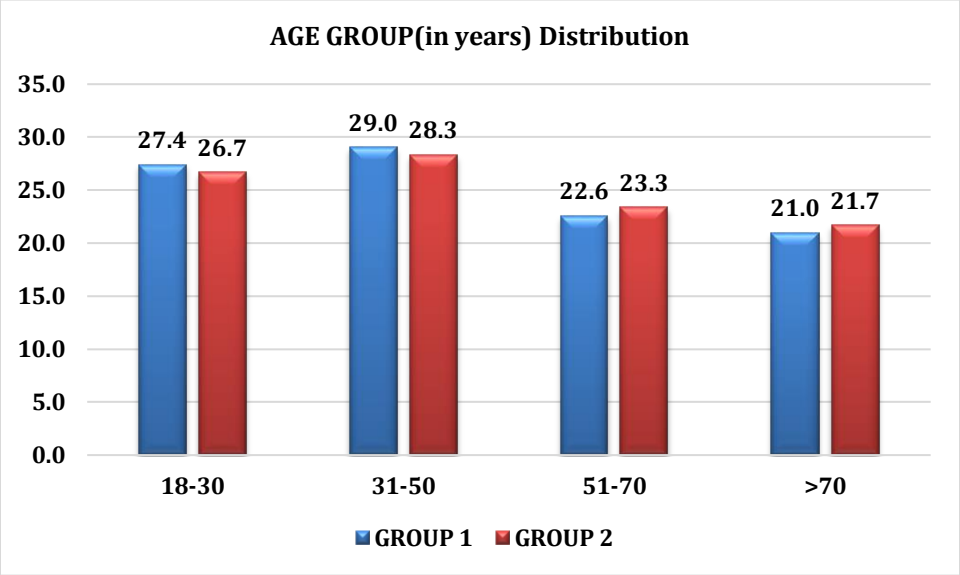


Table-Gender Distribution

In our study out of 62 cases in Group 1, 61.3% cases were male, and 38.7% cases were female and in Group 2, 61.7% cases were male, and 38.3% cases were female. There was no significant difference in the gender of cases between Group 1 and Group 2.

	GROUP 1		GROUP 2		P-Value
	Number	**Percentage%**	**Number**	**Percentage%**	
Sex					**0.966#(not**

Male	38	61.3	37	61.7	**significant)**
Female	24	38.7	23	38.3	
Total	62	100.0	60	100.0	

Table- Pain Score

	GROUP 1		GROUP 2		P-Value
PAIN SCORE	**Number**	**Percentage%**	**Number**	**Percentage%**	
1-3	0	0.0	28	46.7	**0.000*(significant)**
4-6	20	32.3	26	43.3	
7-9	27	43.5	6	10.0	
10	15	24.2	0	0.0	
Total	62	100.0	60	100.0	

In our study out of 62 cases in Group 1, a pain score of 1-3 in 0(none) of cases, a pain score of 4-6 in 32.3% of cases, a pain score of 7-9 in 43.5% of cases, a pain score of 10 in 24.2% of cases, and in Group 2, a pain score of 1-3 in 46.7% of cases, a pain score of 4-6 in 43.3% of cases a pain score of 7-9 in 10.0% of cases, a pain score of 10 in 0(none) of cases. There was a significant difference in the pain score of cases between Group 1 and Group 2.

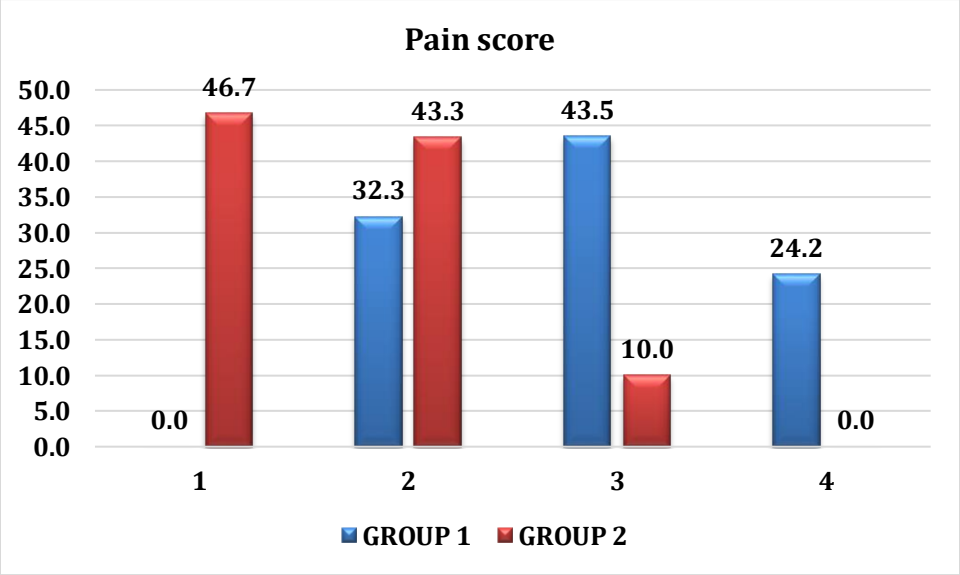


Table-Level of Pain

	GROUP 1		GROUP 2		P-Value
	Number	Percentage%	Number	Percentage%	
PAIN LEVEL					**0.000*(significant)**
MILD	20	32.3	54	90.0	
MODERATE	42	67.7	6	10.0	
Total	62	100.0	60	100.0	

In our study out of 62 cases in Group 1, 32.3% of cases had mild levels of pain and 67.7% of cases had moderate levels of pain in Group 2 out of 60 cases, a maximum of 90.0% of cases had mild levels of pain and only 10.0% of cases had moderate levels of pain. There was a significant difference in levels of pain cases between Group 1 and Group 2.

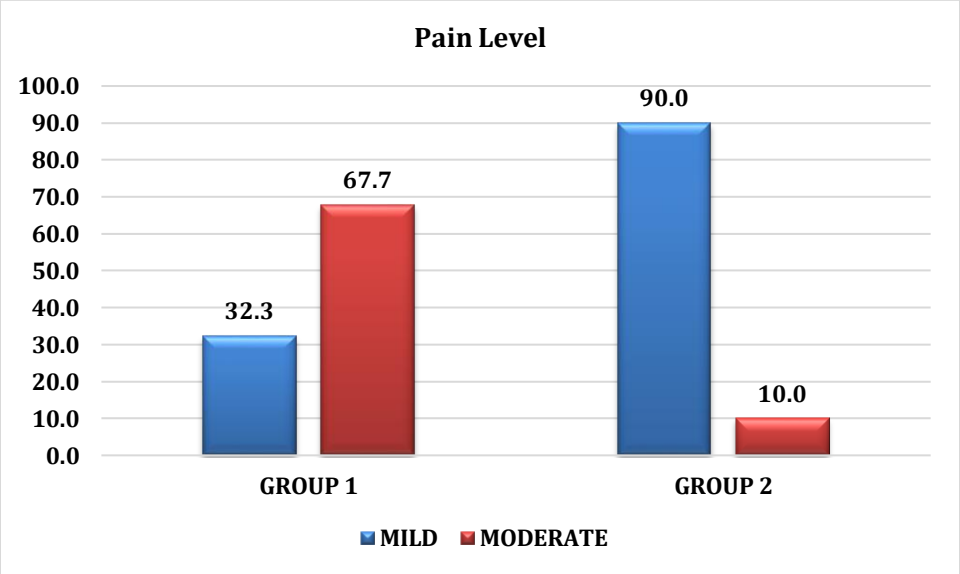
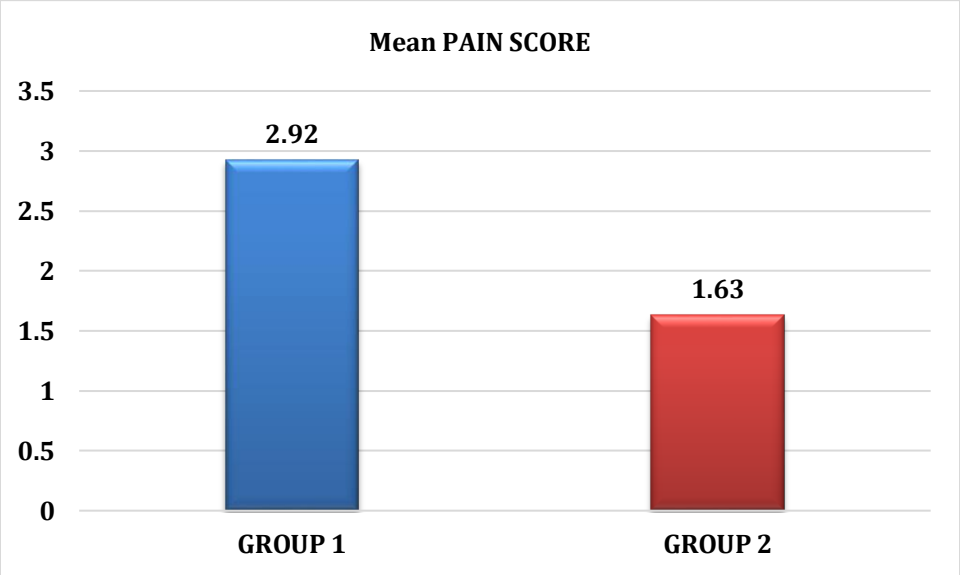


Table-Mean pain score in Group 1 and Group 2.

GROUP	GROUP 1	GROUP 2	Mean Difference	
PAIN SCORE USING VAS SCALE(1-10)	2.92 ± 0.75	1.63 ± 0.66	1.29	**0.000*(significant)**

In our study in Group 1 mean pain score was 2.92 ± 0.75 and in Group 2 mean pain score was 1.63 ± 0.66. The mean pain score was less in Group 2 as compared to Group 1 and the mean pain score difference was 1.29. There was a significant difference in the mean pain score between Group 1 and Group 2.



Summary

In our study out of 62 cases in group 1, 27.4% cases were in the age group of 18-30 years,29.0% cases were in the age group of 31-50 years,22.6% cases were in the age group 51-70 years and 21.0% cases were in the age group of >70 years and Group2,26.7% cases were in the age group of 18-30 years,28.3% cases were in the age group of 31-50 years, 23.3% cases were in the age group of 51-70 years and 21.7% cases were in the age group of 70 years, The mean age of cases in Group 1 was 22.6 ± 4.6 years and in Group2 was 22.6 ± 4.6 years, There was no significant difference in age group of cases in between group 1 and Group2.

In our study out of 62 cases in Group 1, a pain score of 1 in 0(none) of cases, a pain score of 2 in 32.3% of cases, a pain score of 3 in 43.5% of cases, a pain score of 4 in 24.2% of cases, and in Group 2, a pain score of 1 in 46.7% of cases, a pain score of 2 in 43.3% of cases a pain score of 3 in 10.0% of cases, a pain score of 4 in 0(none) of cases. There was a significant difference in the pain score of cases between Group 1 and Group 2.

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Conclusion

Patients reported less pain during the injection prick when lignocaine spray was applied as opposed to lidocaine gel. By avoiding uncomfortable inferior alveolar nerve blocks and lowering patient anxiety, this study implies that lignocaine spray may be useful in delivering anesthetic as a preventative measure for anxiety and pain.

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