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The Efficacy of Preemptive Submucosal Dexamethasone at Temporalis Muscle and Medial Pterygoid Muscle in Preventing Trismus Following Mandibular Third Molar Surgery: A Comparative Split mouth Study

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Abstract

Introduction

The profound antiinflammatory properties of dexamethasone alleviated trismus with reducing the production of chemical mediators, edema, and pain. Similarly, preemptive submucosal injection of dexamethasone for the treatment of surgery-induced edema was regarded as a safe, effective, and uncomplicated method of pain management. To evaluate postoperative complications, submucosal dexamethasone was compared to placebo in the temporalis and medial pterygoid muscles of the same patient at 2-week intervals after surgery on the patient's third mandibular molars.

Materials and Methods

Thirty patients (20-40 years old, mean age: 25) with bilateral class II position B/C soft tissue-covered impactions participated in a randomised, triple-blind study. Using the sequentially-numbered, opaque/unclear, tightly sealed envelopes (SNOSE) technique, Subject/patients were randomly assigned/allocated to either the D (right/left side) or P (right/left side) research groups. Patients who had undergone bilateral procedures separated by two weeks recorded with pain, swelling, and mouth opening periodically.

Results

The comparison between Groups D & P focused on assessing Swelling, Mouth opening & Pain scores. GroupD exhibited superior outcomes in terms of reduced swelling, improved mouth opening, & decreased pain compared to GroupP. Statistical tests, including the Friedman examination/test, Mann WhitneyU examination/test, and Repeated Measure ANOVA, were employed to analyze/examine the variations/differences between groups at various time frame. The statistical examination/analysis confirmed that Group D consistently outperformed Group P in the aspects of swelling reduction, enhanced mouth opening, and postoperative pain relief.

Conclusion

By conclusion, preoperative administration of steroids reduces postoperative trismus and improves patient outcomes. Dexamethasone administered submucosally reduces swelling and restores mouth opening. The benefits of multiple postoperative dosages must be confirmed in studies with larger sample sizes.

Keywords: Mandibular third molar surgery, Sub mucosal, Dexamethasone, medial pterygoid muscle, temporalis muscle, dental, quality of life

Introduction

In the realm of oral surgery, the proactive administration/preemptive of dexamethasone, a potent corticosteroid, has emerged as a promising approach to enhance patient outcomes after third molar surgery (1),(2),(3). This proactive approach involves administering dexamethasone prior to the surgical procedure, aiming to mitigate the inflammatory response that commonly accompanies this type of surgical intervention. By preemptively addressing the inflammatory cascade, dexamethasone has shown efficacy in minimizing post-operative swelling (4),(5), pain (6),(7),(8), and trismus (9),(10),(11), which are key factors contributing to patient discomfort and delayed recovery (12), (13). Due to its well-established antiinflammatory properties, incorporating dexamethasone as a preemptive treatment in 3rd molar surgery offers a valuable supplementary therapeutic approach that should be taken into account to enhance patient care and enhance surgical outcomes.

Dexamethasone (14), a potent synthetic corticosteroid, demonstrates a multifaceted mechanism of action that underlies its therapeutic efficacy. After being administered, dexamethasone easily permeates cell membranes and attaches to specific cytoplasmic glucocorticoid receptors, the complex then translocates into the nucleus, acting as a transcription factor to modulate gene expression and regulate various cellular processes. In context of 3rd molar extraction, when dexamethasone is administered at the submucosal level, it exerts its pharmacological effects locally within the surgical site. The drug diffuses into the surrounding tissues and interacts with glucocorticoid receptors in target cells. By binding to these receptors, the dexamethasone-receptor complex influences gene expression and subsequently suppresses the synthesis and diffusion of pro-inflammatory cytokines, chemokines, & other factors involved in the inflammatory cascade. By locally inhibiting inflammatory molecules, the administration of dexamethasone at the submucosal level provides relief from the post-operative inflammatory response commonly associated with swelling, pain & trismus following 3rd molar extraction. Furthermore, dexamethasone's anti-inflammatory properties at the surgical site foster a favorable environment for tissue repair and regeneration, thereby reducing the likelihood of complications such as infection & delayed wound healing. Through its targeted mechanism of action, the submucosal administration of dexamethasone proves to be a valuable strategy in optimizing patient outcomes and enhancing the post-operative healing process in third molar surgery. Trismus (15), characterized by restricted mouth opening resulting from involuntary muscle contraction or spasm associated with mastication, involves the engagement of several key muscles. The temporalis muscle, anchored along the ascending ramus, and the medial pterygoid muscles, located posterior to the pterygomandibular raphae, play integral roles and are susceptible to trauma during third molar surgery. Factors such as inflammation, trauma, or prolonged muscle spasm can trigger the onset of trismus in these muscles. Muscle-associated trismus, often observed as a complication following third molar surgery, significantly affects various functional aspects, including speech, eating, oral hygiene, and overall quality of life. Management of this condition involves identifying and addressing the underlying cause, which may involve inflammation management or infection control, in addition to implementing physical therapy techniques aimed at stretching and relaxing the affected muscles. Combining anti-inflammatory medications, analgesics, and physical therapy regimens encompassing stretching and jaw exercises, treatment strategies for muscle-associated trismus following third molar surgery aim to alleviate discomfort, enhance jaw mobility, and facilitate a smoother post-operative recovery. According to Grossi GB et al. (16), the submucosal injection 4mg dexamethasone demonstrates effective reduction of postoperative facial edema following 3rd molar extraction. However, increasing dosage to 8 mg does not yield additional benefits. O'Hare PEet.al. (17) found in a comprehensive review alongside a meta-analysis that submucosal administration of dexamethasone after impacted lower 3rd molar removal mitigates early postoperative pain and edoema. Although trismus has improved, this improvement is not considered clinically significant. Nair RB et al. (18) investigated the analgesic efficacy of intraoperative dexamethasone administered submucosally at a dose of 4 mg for third molar surgery. In this study, fifty patients received submucosal dexamethasone and fifty served as a control group. On day 2, the group administered submucosal dexamethasone had a statistically significant reduction in postoperative edoema. However, neither group significantly outperformed the other in terms of discomfort or trismus.

In the research carried out by S. Kaewkumnert et.al. (19), it was recently demonstrated that submucosal administration of dexamethasone (4 mg) effectively reduces postoperative pain after 3rd molar extraction. The reduction in swelling achieved through this method is comparable to, if not greater than, that observed with other delivery methods. This approach simplifies the medication administration process for the surgeon &patient. The study/research involved twenty-seven individuals who underwent surgery on 54 mandibular third molars, with each side of the mouth receiving either intraosseous or submucosal injection. Pain, swelling, & mouth opening were assessed at various time points after surgery. Pain and edoema were not significantly different between the two injection techniques. On postoperativeday 3, however, submucosal injection was associated with improved trismus outcomes. It was found that submucosal dexamethasone injection was more effective than intramuscular injection for treating trismus following surgery on the mandibular 3rd molar. Multiple studies have demonstrated that submucosal dexamethasone administration doesn't significantly decrease trismus following third molar surgery.These studies primarily focused on broad submucosal administration instead of targeting the temporalis and medial pterygoid muscles, which play a crucial role in mastication. However, the prophylactic use of dexamethasone as an anti-inflammatory medication has been proven to be an effective, safe, and uncomplicated therapeutic approach for reducing edema, pain & trismus following surgery involving impacted 3rd molars. It should be noted that submucosal dexamethasone administration to the medial pterygoid and temporalis regions has not been proven to prevent trismus. The purpose of this research/trial was to examine the effects of submucosal dexamethasone versus placebo administered at 2-week intervals to the same patient after lower 3rd molar extraction procedure, with a focus on pain, edoema/swelling, and trismus.

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Materials & Methodology

Study Design

The prospective, randomized trial involved the recruitment of 30 participants from the Oral & Maxillofacial Surgery Department Out patient at Saveetha Dental Hospital. The study/trial took place under ethical guidelines, with approved from the Institutional Review Board (IRB) and each patient'sInformed Consent. Eligible participants included individuals with impacted lower 3rd molars in Bilateral class II position B/C, weighing less than 90kg, and having (ASA) American Society of Anesthesiologists status-I (20). The study/trail design followed a triple blinded and placebo controlled approach. To ensure the integrity of the study, certain exclusion criteria were applied. Patients who had used a sedative, tranquillizer, or analgesic within the previous 24 hours were excluded. Additionally, individuals with impacted third mandibular molars in positions other than classIII positionC, previous evidence of dexamethasone sensitivity, bleeding disorders, cardiac disorders, endocrine disorders, or skin disorders were also excluded from the study.

Randomization

Two groups were distributed at random to the participants: the study group (D) & the control group (P).. GROUP D received a submucosal injection of 4mg dexamethasone, while GROUP P received a submucosal saline injection as a placebo. The SNOSE method was utilised to conceal the study's allocation. A third party sealed allocated random alphabets to the dark envelopes carrying the group's names. Participants were allocated research numbers in numerical order, and were then treated in accordance with their respective categories. After 1-2 weeks, the same patient underwent a second impaction surgery on the other side while receiving the drug that was prescribed for that cohort. For the distribution, computer-generated random numbers were employed. The opaque envelops, which had been marked and numbered by a third party, were carefully secured by a nurse. The intraoperative procedure was concealed from the primary researcher by having each participant choose an envelope at random upon arrival. The on-duty nurse prepared the solutions in 2ml syringes and blinded them using micropore prior to the third molar extraction.

Surgical protocol

To prevent operator bias, an experienced surgeon and assistant conducted the operation in a sterilised, clinical setting. Both groups received submucosal injections at the temporalis muscle connection at the ascending ramus and the medial pterygoid muscle, which is posterior to the pterygomandibular raphe, ten minutes prior to surgery. In order to induce local anaesthesia, the inferior and lingual alveolar nerves were blocked regionally, and the buccal nerve was infiltrated. After confirming a negative aspiration, a slow administration of up to 3.6ml lidocaine/lignocaine with a concentration of 2% and 1:1 lakh adrenaline/epinephrine was performed. A crevicular incision given in conjunction of the 2nd & 3rd lower molar teeth, extending through the buccal gingival sulcus. Additionally, a posterior/distal relieving incision made. SURTEX®Howarth's periosteal elevator was employed to lift and separate a complete mucoperiosteal membrane, which was subsequently held back using an Austin retractor. Buccal and distal bone gutter was performed with 702bur connected to a straight hand piece, while maintaining continuous irrigation with sterile normal saline solution (0.9%). Bone guttering was extended slightly beyond the furcation area. After examining the cavity, irrigating it, and closing the opening with 3-0 silk, the teeth were removed from the crown and delivered. At the 6-hour, 24-hour, and 7-day postoperative follow-up appointments, we utilised a Visual Analogue Scale in conjunction with the Wong-Baker Facial Ideographic Scale to measure pain. There was no attrition among the participants throughout the research. upon completion the extraction of the impacted lower third molar, both groups were given an Aceclofenac tablet (100mg) + Paracetamol (325mg) (Zerodol-P) & mouthwash (21), to be taken twice daily for a duration of three days. Detailed post-operative instructions, both verbal & written, were provided to the patients, emphasizing the need to promptly seek medical attention in the event of challenges, such as excessive haemorrhage or severe pain,in the hours or days following the extraction. After a week, the surgical sutures (22) were removed.

StatisticalAnalysis

Version 23 of IBM'sS P S S (Statistical Package for the Social Sciences) was employed for data analysis. To analyse the ordinal variable representing Pain, nonparametric percentage and frequency calculations followed by the Within Group - Friedman test were performed. The Mann-Whitney examination was used to compare the two groups. For both the continuous and parametric variables Swelling and Mouth Opening, descriptive statistics including mean±SD were calculated. Utilising repeated-measures analysis of variance(ANOVA), both within-group and between-group differences were investigated. A significance threshold of 0.05 and less than was used, and results meeting this criterion were considered statistically significant.

Results

OMFS (oral and maxillofacial surgery) Dept. conducted research involving 30 volunteers/ subjects who had impacted mandibular 3rd molars. The age of the subject varied between 18 to 40, with an average/mean age of 25. The study sample size consisted of 12 females and 18 males, totaling 60 individuals. To ensure fairness, the 60 impacted teeth were evenly distributed among two groups of thirty participants each.

Comparison of mouth opening (in mm) (mean ± standard deviation) values between 2 groups on different time periods:

MOUTH OPENING	PRE OP	6th HOUR	24th HOUR	3rd DAY	7th DAY
Group D	39.7± 4.52	39.5± 4.55	39.2± 4.49	37.5±4.46	39.1±4.29
Group P	39.6± 4.55	34.8± 3.79	29.2± 4.16	25.5±4.31	34.3±2.74

Table 1. The changes in mouth opening (inter incisal distance) measurements at different time intervals are presented in Table 1, which includes pre-op, 6th hour, 24th hour, 3rd day & 7th day. The study aimed to compare the mouth opening measurements between two groups, namely Group D and Group P, over the course of time. After surgery, Group D experienced a minor decrease in mouth opening, whereas Group P exhibited a notable decrease that showed partial recovery by the 7th day.

The comparison of mouth opening measurements (in mm) was conducted using the Repeated Measures ANOVA test between two groups and within the group at different time period

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter
mouthopening	Pillai's Trace	.917	151.749[b]	4.000	55.000	.000	606.996
	Wilks' Lambda	.083	151.749[b]	4.000	55.000	.000	606.996
	Hotelling's Trace	11.036	151.749[b]	4.000	55.000	.000	606.996
	Roy's Largest Root	11.036	151.749[b]	4.000	55.000	.000	606.996
mouthopening * groups	Pillai's Trace	.880	100.546[b]	4.000	55.000	.000	402.182
	Wilks' Lambda	.120	100.546[b]	4.000	55.000	.000	402.182
	Hotelling's Trace	7.312	100.546[b]	4.000	55.000	.000	402.182
	Roy's Largest Root	7.312	100.546[b]	4.000	55.000	.000	402.182

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter
Intercept	386549.666	1	386549.666	5173.736	.000	5173.736
groups	3010.234	1	3010.234	40.290	.000	40.290
Error	4333.403	58	74.714			

In Table 2, an intergroup comparison of mouth opening(interincisal distance) measurements applying the repeated measures ANOVA Test is presented. The table examines the variations in mouth opening measurements between two groups as well as within each group at different time intervals. The results indicate that the effect value for mouth opening was statistically significant ($p < .05$) for all four measures: Hotelling's Trace, Wilks' Lambda, Pillai's Trace & Roy's Largest Root. Furthermore, the effect value for the interaction between mouth opening and groups was also found to be significant ($p < .05$) across all four measures.

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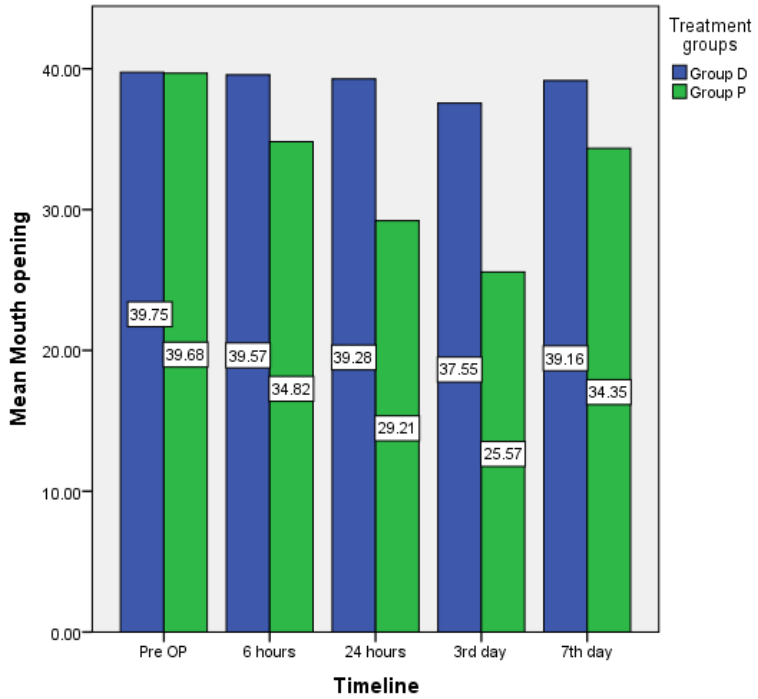
Comparison of mouth opening measurements (in mm) between group D (DEXA) and group P (placebo) on different time periods



Graph 1 illustrates mouth opening measurements over time for Group D and Group P. Group D consistently had higher measurements than Group P, with the largest difference observed on the 3rd and 7th day post-operation. Group P experienced a significant decrease immediately after the operation, which gradually improved over 7 days.

Comparison of Swelling (in mm) (mean ± standard deviation) values between 2 groups on different time periods

LING	PRE OP	6th HOUR	24th HOUR	3rd DAY	7th DAY
GROUP D	10± 0.44	10.4± 0.43	11± 0.58	13.6±1.06	10.9 ±0.64
GROUP P	10±0.47	11.1±0.78	12.6± 0.7	15.7 ±1.32	11±0.66

Table 3 displays swelling measurements over time for Group D and Group P at various time points, including pre-operation, the 6th hour, 24th hour, 3rd day, and 7th day. In Group D, swelling increased gradually until reaching a peak on the 3rd day, followed by a noticeable reduction by the 7th day. In Group P, swelling exhibited a similar pattern, reaching a peak on third day & reducing by seventh day.

The comparison of Swelling measurements (in mm) was conducted using the Repeated Measures ANOVA test between two groups and within the group at different time periods

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter
swelling	Pillai's Trace	.958	311.450[b]	4.000	55.000	.000	.958	1245.798
	Wilks' Lambda	.042	311.450[b]	4.000	55.000	.000	.958	1245.798
	Hotelling's Trace	22.651	311.450[b]	4.000	55.000	.000	.958	1245.798
	Roy's Largest Root	22.651	311.450[b]	4.000	55.000	.000	.958	1245.798
swelling * Groups	Pillai's Trace	.768	45.419[b]	4.000	55.000	.000	.768	181.674
	Wilks' Lambda	.232	45.419[b]	4.000	55.000	.000	.768	181.674
	Hotelling's Trace	3.303	45.419[b]	4.000	55.000	.000	.768	181.674
	Roy's Largest Root	3.303	45.419[b]	4.000	55.000	.000	.768	181.674

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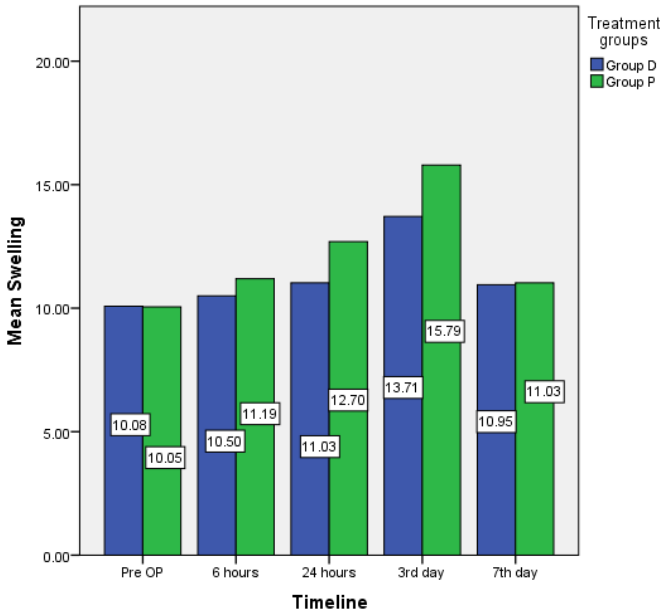
Tests of Between-Subjects Effects							
Measure: MEASURE_1							
Transformed Variable: Average							
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter
Intercept	41017.873	1	41017.873	34385.477	.000	.998	34385.477
Groups	63.572	1	63.572	53.293	.000	.479	53.293
Error	69.187	58	1.193				

Table 4 provides an intergroup comparison of swelling measurements using the Repeated Measures ANOVA test. The results indicate significant effects of swelling and the interaction between swelling and groups, suggesting differences in swelling measurements between the groups at different time periods.

Comparison of swelling measurements (in mm) between group D (DEXA) and group P (placebo) on different time periods



Graph 2 displays the intergroup comparison of swelling measurements between groupD & groupP at various time intervals: pre-operation, the 6th hour, 24th hour, 3rd day, & 7th day. The comparison was conducted using the Repeated Measures ANOVA test. Throughout all time points, the mean swelling measurements for Group D consistently remained lower than those of Group P. However, the disparity between the 2 groups was most noticeable on the 3rd & 7th day after extraction, with Group P exhibiting significantly higher swelling measurements in comparison to Group D.

Comparison of pain (VAS score) within group D (DEXA) on different time periods using Friedman Test

GROUP D	MEANRANK	N	ChiSquare	df	Asymp. Sig
PRE OP	1.62	30	90.84	4	0.000
6th HOUR	3.35				
24th HOUR	4.57				
3rd DAY	3.83				

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7th DAY	1.63				

Table 5 presents the results of the Friedman test, which was utilized to assess pain levels (measured using VAS scores) within Group D (DEXA) at various time intervals: pre-operation, the 6th hour, 24th hour, 3rd day & 7th day. The research revealed a significant disparity (p<0.05) between the mean ranks for pain scores at various time points for group D. The highest mean rank of pain scores was observed at the 24th hour following the operation, while the lowest mean rank of pain scores was recorded on the 7th day post-operation.

Comparison of pain (VAS score) within group P (placebo) on different time periods using Friedman Test

GROUP P	MEANRANK	N	Chi Square	df	Asymp. Sig
PRE OP	1.47	30	84.74	4	0.000
6th HOUR	3.52				
24th HOUR	4.47				
3rd DAY	3.68				
7th DAY	1.87				

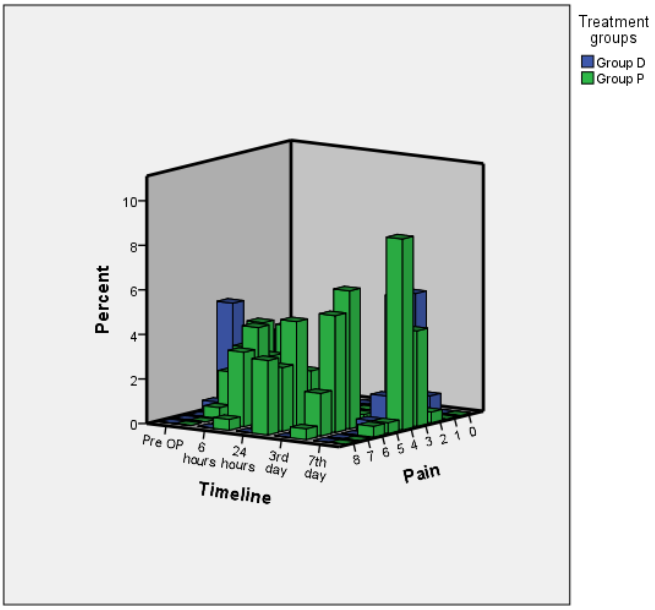
In Table 6, the utilization of the Friedman test to compare pain levels (measured using VAS scores) within Group P (placebo) at various time intervals is presented. The time periods include pre-operation, the 6th hour, 24th hour, 3rd day & 7th day. The analysis indicated a significant difference in the mean ranks of pain scores for groupP across different time points (p < 0.05). The highest mean rank of pain scores was observed at the 24th hour following the operation, while the lowest mean rank of pain scores was recorded on the 7th day post-operation.

Comparison of pain (VAS score) within 2 groups on different time periods using Mann whitney U Test

Groups	N	MeanRank	Sum of Ranks	Mean±std. Deviation	Mann-WhitneyU	WilcoxonW	Z	Asymp.Sig. (2-tailed)
Group D	150	129.99	19498.00	3.9±1.7	8173.000	19498.00	-4.161	0.000
Group P	150	171.01	25652.00	4.8±1.78				

Table 7 displays the utilization of the Mann-WhitneyU test to compare pain levels (measured using VAS scores) within Group D (DEXA) at various time intervals, including pre-operation, the 6th hour, 24th hour, and 3rd day. The analysis revealed that the mean rank of pain scores for group D was significantly lower than that of Group P (placebo) (p < 0.05). The highest mean rank of pain scores for Group P was observed at the 24th hour following the operation, whereas the highest mean rank of pain scores for group D was recorded on the 3rd day post-operation.

Comparison of pain (VAS score) within 2 groups on different time periods in frequency and percentage



Graph 3 presents a comparison of the frequency and percentage of pain levels (measured using VAS scores) between Group D (DEXA) and Group P (placebo) at various time intervals: pre-operation, the sixthhour, 24thhour, 3rd day, & seventh day. The pains cores for both groups were assessed on a scale ranging from 0 to 5. The Mann-Whitney U examination was used to compare the pains cores of the two groups at various time intervals. The findings demonstrated that, in general, groupD had lower pains cores compared to groupP, and statistically significant differences were observed at certain time intervals.

Discussion

Submucosal dexamethasone was injected into the medial pterygoid and temporalis muscles of individuals undergoing third molar surgery in order to compare their effectiveness in preventing postoperative temporalis. The results revealed a comparison between the mouth opening measurement of Group D and Group P at various periods. Group D's postoperative outcomes were superior, with consistently higher measures. The Repeated-Measures Analysis of Variance revealed a time- and group-dependent increase in Group D's mouth-opening measures. The end result of this research demonstrated that preventative medication/preemptive effectively mitigates the severity of trismus. The degree of edoema/swelling is modulated by a number of variables, including the duration and intensity of the operation, as well as the manipulation of soft tissues and removal of bone. Dexamethasone, through its inhibition of phospholipase A2, plays a role in reducing synthesis of inflammatory molecules like prostaglandin & leukotriene, which are arachidonic acid metabolites. Submucosal administration of dexamethasone proved effective in minimizing postoperative swelling & trismus.Table 3 presents a comparison of edema measurements between Group D and Group P at different time intervals. Notably, Group D exhibited the most prominent swelling on the third day, followed by a decrease on the 5th day & further subsiding on the 7th day. Meanwhile, Group P showed a similar pattern, but with more pronounced edema. The Repeated Measures ANOVA test confirmed a significant effect (p=0.000) of time,group, & the influence between time & groupon swelling measurements. Group D had consistently reduced swelling readings than Group P, with the largest difference occurring between the third and seventh postoperative days (Figure 2). Submucosal dexamethasone is more beneficial for third molar procedures because it reduces postoperative mouth opening and edoema. Using the Friedman test, we determined that Group D (DEXA) and Group P (placebo) reported significantly difference levels of pain at different time intervals. The average pain ratings of both groups reached at 24 hours post-surgery and reached a minimum seven days later. The Mann-Whitney U test revealed that Group D had a significantly reduced mean rank of pain ratings than Group P, with the highest mean rank occurring three days after surgery for Group D and twenty-four hours after surgery for Group P. Graph 3 demonstrates that, when comparing Groups D and P, Significant statistical disparities in pain levels were observed across multiple time intervals. In a preliminary clinical study by Moore et al. (23), preoperative rofecoxib, intraoperative dexamethasone, and their combination were evaluated for their analgesic efficacy and decrease in trismus in patients undergoing third molar extraction. The study's findings indicated that both preoperative rofecoxib and intraoperative dexamethasone had beneficial effects on patients undergoing surgery for impacted 3rd molars. Bhargava.et.al. (24)executed a prospective in nature, randomised, double-blind trial involving patients with classII positionB 3rd molar impaction in the mandible. Sixty patients were divided into six groups and administered dexamethasone via different routes. Postoperatively, pain, facial edema, and trismus

were assessed. Compared to control group, patients in the steroid groups reported higher levels of satisfaction with the treatment, reduced facial edema, and decreased trismus. Notably, the clinical effects of intra-space injections of dexamethasone were comparable to those of more conventional administration routes. Oral dexamethasone (20 mg) administered prior to and during surgery on the mandibular third molars decreased trismus and increased mouth opening significantly (Mozaffari, H.R. et al., (25). At lesser concentrations, the effects of dexamethasone having more mouthopening observed. In a research investigation conducted by Shubha.et.al. (26), the efficacy of preoperative intramuscular or submucosal injections of dexamethasone or methylprednisolone in managing postoperative pain, edema, & mouthopening following the removal of lower 3rdmolars was compared. When injected submucosally rather than intramuscularly, both pharmaceuticals were more effective at reducing discomfort, edoema, and trismus. In terms of alleviating discomfort and restoring mandible mobility, intramuscular dexamethasone was preferable to intramuscular methylprednisolone. In addressing post-surgical complications, dexamethasone has demonstrated superior efficacy compared to methylprednisolone. The submucosal administration of dexamethasone offers advantages such as a repository effect and a straightforward application method. A randomized, controlled, double-blind study conducted by Lau AAL et al. (27) investigated the effectiveness of submucosal & intravenous dexamethasone in reducing edema, irritation, & trismus following 3rdmolar surgery. The study involved 130 participants, and both administration methods were found to be equally effective in managing the measured outcomes. In comparison to oral pain relievers, preemptive submucosal have a longer-lasting analgesic effect ensuring sustained effectiveness and convenience. These preemptive analgesics have gained popularity as an analgesic modality in recent years due to their ease of application, minimizing the trismus complications.

Limitation

Due to limited scope of the study, consideration is required when interpreting the results. The sample size was small, and the study focused on a limited number of variables. Future clinical trials should administer submucosal dexamethasone frequently, at least once per day, in order to obtain more reliable results. This strategy would permit dexamethasone to operate locally, at the site of interest, and could therefore produce more comprehensive results.

Conclusion

In summary, administering prophylactic steroids during the prepharse of surgery can effectively mitigate trismus and enhance the overall results of the surgical procedure. Compared to placebo, submucosal dexamethasone treatment resulted in less edoema and greater mouth opening. The use of preemptive submucosal dexamethasone targeting the medial pterygoid and temporalis muscles appears promising for preventing postoperative trismus. Nonetheless, additional researches/studies with larger/greater samples is necessary to verify these results/findings. Additionally, future research should investigate the potential benefits of frequent submucosal dexamethasone administration, preferably with at least one daily dose postoperatively, which may contribute to the elimination of trismus entirely.

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