



EFFECTS OF CO-ADMINISTRATION OF DEXAMETHASONE AND DICLOFENAC SODIUM ON THE POST-OPERATIVE OUTCOMES FOLLOWING MANDIBULAR THIRD MOLAR SURGERY UNDER LOCAL ANAESTHESIA

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ABSTRACT

Background: The apparent interactions between the mechanisms of action of non-steroidal anti-inflammatory drugs (NSAIDs) and steroids imply that co-therapy may provide beneficial inflammatory and pain relief in the absence of side effects. The aim of the study was to compare the effect of co-administered dexamethasone and diclofenac sodium (diclofenac Na) with diclofenac Na alone on the postoperative pain, swelling and trismus after surgical removal of mandibular third molars. **Patients and Methods:** A prospective randomized double-blind study was conducted at the Department of Oral and Maxillofacial Surgery, minor surgery clinic at Khartoum Teaching Dental Hospital, Sudan. A total of 120 patients were randomly allocated to three treatment groups; dexamethasone (8mg IV preoperative) and diclofenac Na (75 mg IM preoperatively) group, diclofenac Na alone group (75mg IM preoperatively) and the third group as a control group without medication. The overall analgesic effectiveness of the drug combinations was assessed postoperatively by determination of pain intensity using a visual analogue scale. Facial swelling was measured using a tape measure placed from tragus to gonion to tragus, while interincisal mouth-opening of patients was measured using a metallic ruler preoperatively and post-operatively. **Results:** Co-administration of dexamethasone and diclofenac Na was significantly superior to Diclofenac Na alone for the relief of pain ($P < 0.05$) and facial swelling ($P < 0.05$). However, there was no significant difference for trismus relief between the two medication protocols ($P > 0.05$). **Conclusion:** This study demonstrate enhanced effects of co-administered dexamethasone and diclofenac Na on short-term post-operative pain and swelling, compared to diclofenac sodium alone in mandibular third molar surgery.

KEYWORDS: diclofenac Na, 8mg IV preoperayive, 75mg IM preoperatively.

1-1 INTRODUCTION

Surgical removal of wisdom teeth under local anesthesia is frequently carried out in general dental practice and occupying an appreciable amount of clinical time.^[1,2] Postoperative pain, swelling and trismus are complications followed this procedure.^[1,3] as a direct and immediate results of the surgical procedure.^[4,5] The adverse effects of the wisdom teeth surgery on the quality of life has been reported to show a three times more in patients who experience pain, swelling and trismus alone or in combinations; compared to those who were a symptomatic.^[4,6] Many clinicians have recommend the importance of pre-operative medication for better pain control, swelling and trismus in patients undergoing third molar surgery.^[7,8]

The introduction of non-steroidal anti-inflammatory drugs (NSAIDs, e.g. diclofenac potassium and ibuprofen) has significantly altered the management of post-operative pain in dentistry and medicine. There are

two possible mechanisms for the efficacy of NSAIDs when administered prior to surgical trauma. The first may simply be a pharmacokinetic advantage; by administering the NSAIDs prior to pain onset, drug absorption would have begun, and at the time of pain onset therapeutic blood level will be present. Second, the presence of a cyclooxygenase inhibitor at the surgical site may limit the production of prostaglandins and prostacyclins associated with hyperalgesia and edema.^[9,10] The use of corticosteroids (e.g. dexamethasone, betamethasone) is another preventive strategy for limiting post-operative edema and trismus following third molar extractions. Postoperative swelling and edema may be due in part to the conversion of phospholipids to arachidonic acid by phospholipase A2 and the resultant production of leukotrienes, prostacyclins, prostaglandins and thromboxane A2, acting as mediators of the inflammatory response. The use of steroids may inhibit the initial step in this process.^[11] Clinical experiences in oral surgery have also

supported the hypothesis that pre-operative NSAIDs and corticosteroids are effective in delaying and preventing many postoperative sequelae.^[9]

1-2 Literature review

Many studies have determined the effectiveness of steroids after oral surgical procedures, but now there is no standard dosing regimen for oral and maxillofacial surgeons to follow.^[12]

Skjelbred and Lokken^[13] injected 9 mg betamethasone intramuscularly. Patients were evaluated on the third and sixth post-operative days, with a reduction in swelling of 55% and 69%, respectively. They used a mechanical device for their measurements. Pains were significantly lower in the steroid group.

Beirne and Hollander^[14] after the administration of 125 mg methylprednisolone administered intravenously, they found a significant reduction in pain and swelling, but not trismus.

Braxendale *et al*^[15] gave patients 8 mg dexamethasone or placebo orally two hours before surgery. Patients in the dexamethasone group had significantly lower pain scores four hours after surgery than the placebo group. There was no significant difference between the groups on the first post-operative morning. Pain was reported using a visual analog scale.

Also a randomized prospective double-blind study was conducted by Tarek L. Alkhateeb Hussein A. Marouf, Mohammed A. Mahmmod^[16] to determine the efficacy of sub-mucosal local infiltration of dexamethasone versus methylprednisolone in reducing post-operative pain, swelling and trismus after surgical removal of impacted mandibular third molars. Ninety patients were included in the study and were randomly divided into three groups. Each group consisted of 30 patients for which the first and second groups were given 4 mg of dexamethasone and 125 mg of methylprednisolone, respectively, at 5-10 minutes pre-operatively; the third group served as control. Duration of facial swelling was evaluated subjectively by the patients themselves. Severity of postoperative pain was quantified by counting the number of analgesics taken by the patients during and after surgery (six subsequent days). Trismus was determined by measuring the maximum incisal opening before surgery and on the seventh day, postoperatively. Results showed that duration of facial swelling was almost the same in the three test groups. During surgery, the methylprednisolone group showed a significantly lesser pain than the other two groups; the dexamethasone group showed less marked pain than the control group. Additionally, patients who had taken steroids had a marked increase in the incisal opening postoperatively over the control group. Trismus was significantly reduced in the methylprednisolone group as compared to the dexamethasone group. It is concluded that pre-operative local infiltration of

methylprednisolone and dexamethasone significantly reduced post-operative pain and trismus after surgical removal of mandibular third molar. 125 mg methylprednisolone is more effective in reducing post-operative inflammatory sequelae than a 4 mg dexamethasone.

In a prospective, randomized, controlled, double-blind study done by R.A Dione^[17] of 61 patients demonstrated that pre-operative injection of dexamethasone in the third molar. Oral surgery model reduced inflammation during the postoperative period but was insufficient as an analgesic.

Tiwana PS^[8] was conducted a study to see the impact of intravenous corticosteroids with third molar surgery in patients at high risk for delayed health-related quality of life (HRQOL) and clinical recovery, in which patients at least 18 years of age and with all 4 third molars below the occlusal plane were given IV corticosteroids at base line clinical and HRQOL outcomes of these patients were compared with those of a non-concurrent control group who did not receive corticosteroids. The control group was selected using the same criteria and treated under the same surgical protocol as the corticosteroid group; they stated that the incidence of delayed clinical recovery, a post-surgery visit with treatment, was higher in the control group compared with the corticosteroid group.; their conclusion was the administration of IV corticosteroids before third molar surgery without antibiotics does not hinder clinical recovery even when healthy adult patients are predicted to have delayed recovery. Overall, IV corticosteroid administration had a limited, but beneficial effect on HRQOL outcomes.

Paul A. Moore^[9] was performed a study in which rofecoxib (COX2 inhibitor) and dexamethasone for prevention of pain and trismus following third molar surgery, the goal of this preliminary randomized prospective clinical trial was to compare the analgesic efficacy and the reduction in trismus of pre-operative rofecoxib, intra-operative dexamethasone and both rofecoxib and dexamethasone following third molar extraction surgery. Thirty-five subjects requiring surgical removal of at least 1 partial bony impacted mandibular third molar were invited to participate in this double-blind and double-dummy placebo-controlled clinical trial. Subjects were randomly assigned into one of four treatment groups: first group had placebo orally pre-operatively and placebo IV intra-operatively; the second group took rofecoxib 50 mg orally pre-operatively and placebo IV intra-operatively; the third group had placebo orally pre-operatively and dexamethasone 10 mg IV intra-operatively; and the fourth group had taken rofecoxib 50 mg orally pre-operatively and dexamethasone 10 mg IV intra-operatively. The results of this trial indicate that the use of intra-operative dexamethasone is an effective therapeutic strategy for limiting trismus following surgical removal of impacted third molars. The combination of preoperative rofecoxib

50 mg and intra-operative dexamethasone 10 mg was most effective in minimizing pain and trismus following third molar surgery.

A prospective randomized double-blind study was conducted at the Department of Oral and Maxillofacial Surgery, Lagos University Teaching Hospital, Nigeria performed by Bamgbose^[18] regarding the effects of co-administered dexamethasone and diclofenac potassium on pain, swelling and trismus following third molar surgery in which a total of 100 patients were randomly allocated to two treatment groups of dexamethasone (prophylactic 8 mg and postoperative 4 mg IV) and diclofenac K (50 mg Oral before and after surgery), and diclofenac K alone (as with first group). They stated that the co-administration of dexamethasone and diclofenac K was significantly superior to diclofenac alone for the relief of pain ($P < 0.05$), and facial swelling up to post-operative 48 hour ($P < 0.05$). However, there was no significant difference for trismus relief between the two medication protocol ($P > 0.05$).

W.K Chiu and L.K Cheung^[19] were compared the analgesic efficacy of pre-operative 50 mg oral rofecoxib, 400 mg ibuprofen and placebo in the control of postoperative pain after third molar surgery, it was a clinical randomized, double-blind, cross-over, placebo-and active-comparator-controlled study. The surgeries were randomized into 3 groups, in which patients were given a single dose of 50 mg rofecoxib, 400 mg ibuprofen, or placebo 30-60 minute before the surgery. The patients were asked to quantify their pain intensity basing on a visual analog scale postoperatively. A 500 mg acetaminophen was prescribed to the patients. The quantity and time of consumption of the rescue tablets were recorded by the patients, the results was that; the pain scores within the first 6 hours post-operatively in the rofecoxib group were significantly lower than the placebo ($P < .05$). The ibuprofen group did not have significantly lower pain scores than the placebo group. Regarding the postoperative requirement of rescue medication, the rofecoxib group required significantly less rescue medication than both ibuprofen and placebo groups in the first twelve hours after the surgery. At conclusion, the preoperative oral intake of 50 mg rofecoxib provides a significantly better analgesic benefit than the placebo for postoperative pain relief in the first 6 hours after third molar surgery. This regimen also reduced the requirement of post-operative analgesic when compared with ibuprofen and placebo in the first 12 post-operative hours.

A clinical trial by Markovic A. Todorovic Lj^[20] was done in the effectiveness of dexamethasone and low-power laser in minimizing edema after third molar the aim of this study was to compare the effectiveness of low-power laser (LPL) and dexamethasone after surgical removal of impacted lower third molars under local anesthesia. There were 120 healthy patients divided into four groups of 30 each. Group 1 received LPL irradiation

immediately after operation; group 2 also received intramuscular injection of 4 mg dexamethasone; group 3 received LPL irradiation supplemented by systemic dexamethasone 4 mg intramuscular, followed by 4 mg of dexamethasone intravenous 6 hours post-operatively; and the fourth (control) group received only the usual postoperative recommendations (cold packs, soft diet). The result was that the LPL irradiation with local use of dexamethasone (group 2) resulted in a statistically significant reduction of postoperative edema in comparison to the other groups. No adverse effects of the procedure or medication were observed. They concluded that LPL irradiation after lower third molar surgery can be recommended to minimize swelling. The effect is enhanced by simultaneous local intramuscular use of dexamethasone.

1-3. Justification

In Khartoum Teaching Dental Hospital, surgical removal of impacted mandibular wisdom teeth is done under local anesthesia and it has been noticed that many of our patients reported back complaining of post-operative edema, pain, and trismus. In the medical literature there are many papers to deal with these morbidities, it is not implemented in our hospital; by this study we want to highlight the effectiveness of this combination among our people and encourage doctors to make it as standard pre-operatively when removing wisdom teeth surgically.

1-4. OBJECTIVES

1.4.1 General objective

To evaluate the effectiveness of pre-operative co-administration of dexamethasone and diclofenac sodium in reduction of post-operative complications after surgical extraction of a wisdom tooth.

1.4.2 Specific objectives

- To assess the effect of pre-operative co-administration of dexamethasone and Diclofenac sodium on :-
 - Post-operative trismus.
 - Post-operative pain.
 - Post-operative edema.
- To compare the outcomes of co-administration of dexamethasone and NSAIDS and NSAIDS alone.

2. Patients and methods

2.1 Study design: a prospective randomized double blind clinical trial.

2.2 Study area

Khartoum teaching dental hospital minor surgery clinic.

2.3 Study population

Patients who attend the minor surgery clinic requiring surgical removal of unilateral impacted mandibular third molar tooth under local anesthesia.

2.4 Inclusion criteria

1. Patients above 18 years old.
2. Medically fit patients.

2.5 Exclusion criteria

- 1- Patients under 18 years old.
1. Medically compromised patients (hypertensive patients, diabetic patient, cardiac problems patients, asthmatic patients, patients on steroids).
- 2- Pregnant and lactating ladies (will affect drug prescriptions).
2. Patients presented with swelling, trismus (mouth opening <25mm) at base line.
3. Patients who had taken analgesics or anti-inflammatory drugs within 24 hours before surgery.

2.6 Variables under study

2.6.1 Postoperative outcomes

- 1-Mouth opening.
- 2-Pain.
- 3- Facial swelling.

2.7 Sampling technique

The patients who were referred to minor surgery department from outpatient department were seen by a house-officer dentist, who took a detailed history of the patients. After the patients were examined; the patients were informed about the procedure and possible complications and consent was signed by the patients for their contribution in the study. Then the measurements (interincisal distance and facial width) were taken and complete data entry sheet; after that the patients were randomly allocated in one of our three groups using simple random technique; the control group took no medication, V-group (vortex-group) took diclofenac sodium 75mg IM one hour pre-operatively and the (D+V) - group (vortex+dexamethasone-group took co-therapy diclofenac sodium 75mg IM and 8mg dexamethasone IV one hour pre-operatively.

2.8 Sample size

Using the equation:

$$M_{Repeated} = R \left[\frac{2(Z_{1-\alpha} + Z_{1-\beta})^2}{\Delta^2} + \frac{Z_{1-\alpha/2}}{4} \right]$$

$$R = \left[\frac{1 + (w - 1)p}{w} - \frac{vp^2}{[1 + (v - 1)P]} \right]$$

$M_{repeated}$: the total sample size.

$Z_{1-\alpha/2}$: is a value from the normal distribution related to and representing the confidence level.

$Z_{1-\beta}$: is a value from the normal distribution related to and representing the power of the test.

Δ : Effect size.

ρ : correlation coefficient.

V: observation on each patient before treatment.

W: observation on each patient after treatment.

For this study we assume:

$z_{1-\alpha/2} = 1.96$ for 95% confidence level

$z_{1-\beta} = 0.7721$ for 78% power of the test

Δ : Effect size = 0.35

$\rho = 0.9$

V=0

W=3

The sample size is 40 for each group

2.9 Data collection

2.9.1 Tools

1-data collection sheet which has been filled by the examiner.

2-Measuring tape to measure the facial width, the reference points which will be used are the tip of tragus of the left and right ears with the gonium in between, this measure was carried before surgery and post-operative days day 1, day 7.

3-metallic ruler for measuring the maximum interincisal mouth opening before surgery and postoperative days 1 and 7, the reference points the incisal edges of the upper and lower incisors.

2.9.2 Technique

A single examiner examined all patients pre-operatively collecting and documents the followings:-

- 1- Interincisal distance.
- 2- Clinical & radiological examination of the impacted wisdom tooth according to Winter's classification which depends on angulations of the wisdom tooth.
- 3- Measurement of the facial width.

2.10 Operative procedure

Surgical extraction was done with standardized technique. Inferior alveolar, lingual and buccal nerves were anaesthetized using a local anesthesia injection of lidocaine hydrochloride 2% and epinephrine 1:80000. An envelope full thickness muco-periosteal flap up to the mesial end of the second molar was designed. After osteotomy with slow speed micro-motor the tooth was sectioned and gently elevated. The socket carefully inspected and copious irrigation was performed with 0.9% normal saline. The flap was sutured with interrupted sutures with 3/0 silk. The duration of the procedure was recorded.

2.11 Medications

The operator supplied the medications to insure compliance.

1-Dexamethasone 8mg intravenously.

2-Diclofenac sodium 75mg intramuscularly.

3-All patients will be instructed and placed on post-operative 5 days antibiotic regimen orally (amoxicillin 500mg t.d.s, metronidazole 500mg t.d.s, diclofenac sodium 50mg b.d). Patients were asked to come for follow up on day 1 and day 7 to complete the examination.

2.12 Data processing

Data entry using SPSS to facilitate data analysis for window version 15 statistical software package. One way analysis of variance, student's t-test and chi-squared test was used for measures for category rating scale, interincisal opening and facial swelling, the level of significant was at $p < 0.05$.

2.13 Ethical consideration

The approval for the performance of the study was obtained from the ethics committee of the KTDH; an informed consent was signed by each patient.

3. RESULT

A total of 120 patients (equally distributed into three groups; control group, V-group (vortex-group) and (V+D) group (vortex +dexamethasone -group); who

Table (1) the radiographic analysis

Type of impaction	Mesio-angular	Horizontal	Vertical
Number of impaction	89	17	14
Percent of impaction	74.2%	14.1%	11.7%

Co-administration of dexamethasone and diclofenac Na show a significant reduction in post-operative swelling^[5] after 24hours fig (1) ($P < 0.05$); for the control group the means difference in the facial swelling after 24hours was 0.84mm fig (1).

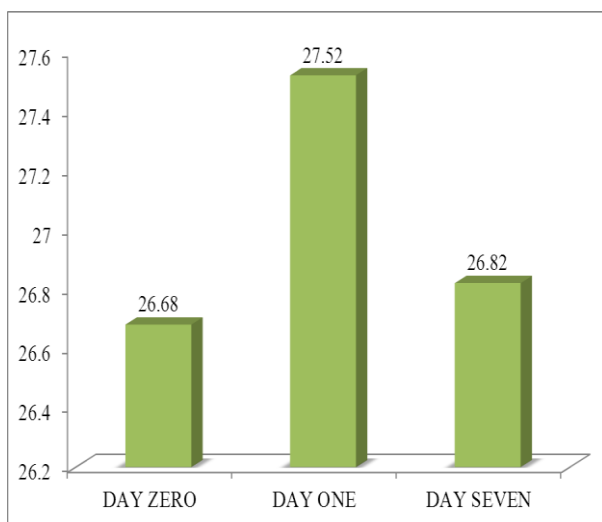
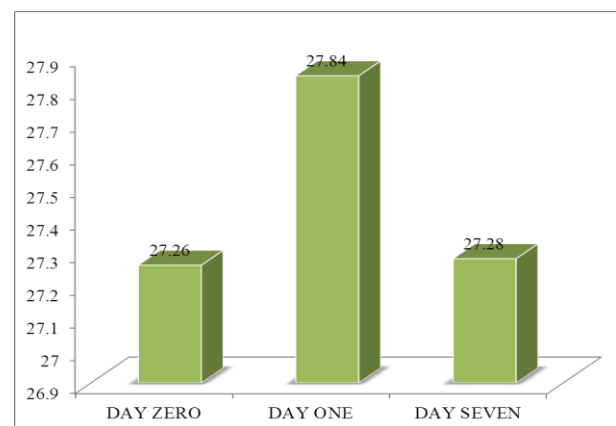


Fig (1): The means of the facial swelling of C-group for the 3-days

For V-group the means difference in the facial swelling after 24 hours was 0.58mm fig(2).

completed the study were included in the analysis. The mean age of the patients was 29.2 ± 5.7 years ranging from 19-40 years (control group: range, 21-40 years mean is 29.5 ± 5.9 years, V-group: range 19-40 years, mean is 28.5 ± 5.7 years and (V+D) group: range 20-40 years, mean is 29.6 ± 6.4 years). In the control- group there was 24 males and 16 females, V-group there was 23 males and 17 females and in the (V+D) - group there was 18 males and 22 females; male-to-female ratio was 1.2:1.

The radiographic analysis table (1) of the type of impactions showed that mesio-angular impactions constituted 74.2% of the cases, followed by horizontal impactions 14.1% and the vertical impactions were 11.7%.



Fig(2): The means of the facial swelling of the V-group for the 3-days

And for (V+D)-group the means difference in the facial swelling after 24 hours was 0.08mm fig (3).



Fig (3): The means of the facial swelling of the (V+D)-group for the 3-days

The following graph fig (4) demonstrates the relationship in between groups for the means in different days.

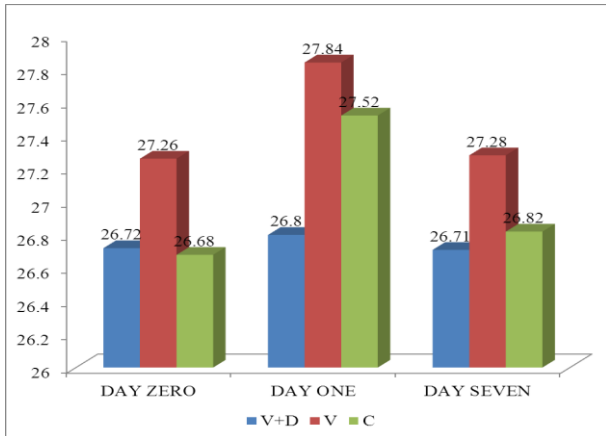


Fig (4): The relation of the means of the facial swelling between groups

Co-administration of dexamethasone and Diclofenac Na showed no significant difference in the inter-incisal distance 24hours post-operatively with the means difference for the control group 1.5mm fig (5).

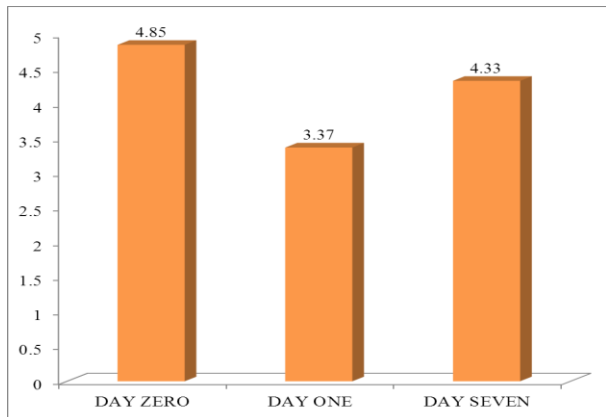


Fig (5): The means of the interincisal distance of C-group for the 3-days

For the V-group the means difference for interincisal distance was 1.7mm 24 hours post-operatively fig (6).

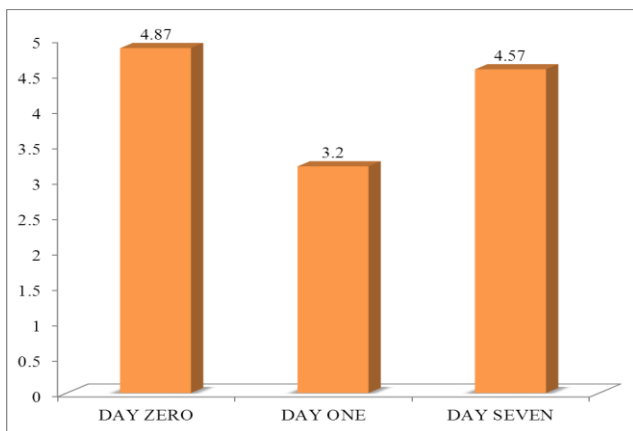


Fig (6): The means of the interincisal distance of the V-group for the 3-days

For the (D+V)-group the means difference for interincisal distance after 24 hours was 1.2mm fig (7).

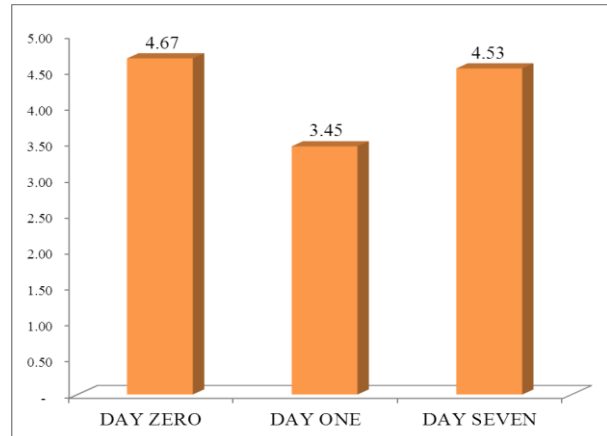


Fig (7): The means of the interincisal distance of the (V+D)-group for the 3-days

The following graph demonstrates the relationship in-between the groups' fig (8) for interincisal distance in different days.

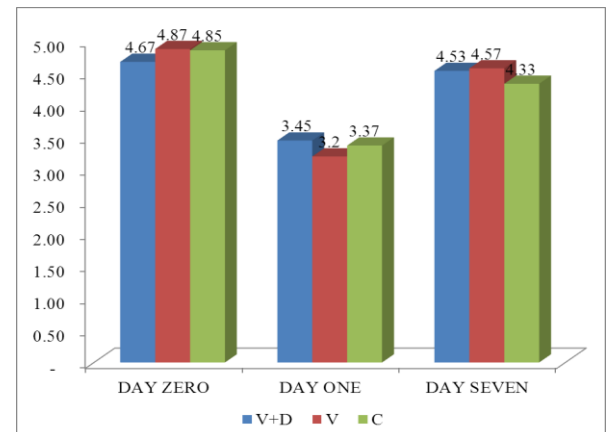


Fig (8): The relation of the means of the interincisal distance between groups

Co-administration of dexamethasone and diclofenac Na showed a significant reduction in post-operative pain ($P < 0.05$); in the control group 24hours postoperatively 7 patients (17.5%) presented with severe pain, 23patients(57.5%) presented with moderate pain and 10 patients(25%) presented with mild pain , in the V- group 24hours postoperatively 1 patient (2.5%) presented with severe pain, 24 patients (60%) presented with moderate pain and 15patients (37.5%) presented with mild pain and in the (V+D)- group 24hours postoperatively no patient presented with severe pain, 1patient(2.5%) presented with moderate pain, 16 patients(40%) presented with mild pain and 23 patients(57.5%) presented with no pain.

Table (2): Pain scores between the three groups

	C-group	V-group	(V+D) group
No pain	-	-	23
Mild pain	10	15	16
Moderate pain	23	24	1
Severe pain	7	1	-

All groups demonstrated no adverse reaction, side effect or other complications (e.g., tendency for bleeding) during the follow-up period.

4.1 DISCUSSION

The intensity or severity of postoperative symptoms such as pain, swelling and trismus, may be reduced by pharmacologically controlling the level of the inflammatory process.^[21,22] The administration of corticosteroids is one technique that has been expected for reduction of postoperative inflammation.^[21] To restrain the development of local fever, redness, swelling and tenderness by which inflammation is documented ;cortisol and the synthetic analogue of cortisol have the ability to impede the physiologic processes of inflammation.^[21] Another technique is to control the synthesis of prostaglandins.

Induction of pain, inflammation and fever were preceded by prostaglandins.^[10,23] The reduction of biosynthesis of prostaglandins by inhibition of the cyclo-oxygenase enzyme system is considered an important mechanism of action of NSAIDs. When administered preoperatively, NSAIDs have been shown to be mainly effective in combating postoperative pain.^[10,23]

Preventive measures for post-operative management of pain and inflammation are based on the known ability of NSAIDs to obstruct the arachidonic acid cascade. When NSAIDs are administered preoperatively, absorption and distribution of the medication may occur before the commencement of tissue trauma, the consequent synthesis of prostaglandins and the following inflammatory response. Prevention of the inflammatory response may decrease the sequelae of tissue trauma; especially the accompanying pain.^[10] Diclofenac Na has been publicized to be useful in controlling postoperative pain after removal of third molars.^[24] Diclofenac Na is known to possess both analgesic and anti-inflammatory effect. Due to its anti-inflammatory effects^[24], the administration of dexamethasone may synergize the anti-inflammatory effect of diclofenac Na and contribute to the reduction of inflammatory exudates as well as edema and pain. Therefore the co-administration of diclofenac Na and dexamethasone may be expected to reduce post-operative pain more than that achieved with diclofenac Na alone.^[24]

Apart from the drug combination used, the pattern of post-operative pain has been reported to increase between the post-operative days 1 and 3, after which the symptoms subside gradually within one week.^[25,26] This study results confirmed this observation.

The comparison of pain intensity between the control group, (dexamethasone-diclofenac Na) group and diclofenac Na group showed significant difference between the three groups ($P < 0.05$), indicating a superior analgesic effect of diclofenac Na when

administered in combination with dexamethasone. This finding confirms the previous reports.^[12, 23,27]

Schultze-Mosgau et al^[28] investigated the combined use of ibuprofen and methylprednisolone for pain relief, concluding that this combination has good analgesic and anti-inflammatory action. It has also been reported that a single dose administration of a glucocorticoid reduces tissue levels of bradykinin and suppresses circulating levels of cortisol and beta-endorphin.^[28] As known, bradykinin and kallidin are the two kinins that act independently as well as synergistically with products of the arachidonic acid cascade to produce both hyperalgesia as well as increased vascular permeability.^[27]

Post-surgical facial edema is difficult to quantify accurately, since it requires a three-dimensional measurement with an irregular, convex surface and can manifest itself internally as well as externally. Over the years, several researchers have tried various techniques in an effort to objectively measure edema^[12,27], most of which are indirect assessments of the altered contours of skin surface. Measurement tools mentioned in the literature have included visual analog scales, trismus recordings, standardized stereo-radiographic or photographic measurements, computerized tomography, modified face bow devices, ultrasonography, facial plethysmographs, or various other means of taking direct facial measurements.^[12,27] In the present study, a single measurement from the tip of tragus to gonion to the tip of contra- lateral tragus was taken. The recordings were made in triplicate and the average was recorded. The cheek swelling following third molar surgery is diffuse in different planes and is very difficult to measure accurately. The co-administration of dexamethasone and diclofenac Na preoperatively produced a clear reduction in postoperative pain and cheek swelling. The mean increase in facial swelling in days 1 in (dexamethasone-diclofenac Na combination) group was significantly less than that of (diclofenac Na only) group and the control group. This result shows that co-administration of dexamethasone diclofenac Na also enhances the control of post-operative facial swelling.^[14,29,30]

The combination of diclofenac and prednisolone offers a better therapeutic outcome regarding pain and swelling, as documented in various studies.^[28,31,32]

The same result was shown by Bamgbose et al; who were conducted a prospective randomized double-blind study at the Department of Oral and Maxillofacial Surgery, Lagos University Teaching Hospital, Nigeria. In which a total of 100 patients were randomly allocated to two treatment groups of dexamethasone (prophylactic 8 mg and postoperative 4 mg IV) and diclofenac K (50 mg Oral before and after surgery) and diclofenac K alone (as with first group).The mean age of the participants was 27.9 ± 5.2 years (range, 19–45 years; group I: 29.8 ± 5.3 years and group II: 26.1 ± 4.5 years), in this study the

mean age of the patients was 29.2 ± 5.7 years ranging from 19-40 years (control group: range, 21–40 years mean is 29.5 ± 5.9 years, V-group: range 19-40 years, mean is 28.5 ± 5.7 years and(V+D) group: range 20-40 years, mean is 29.6 ± 6.4 years).

The male-to-female ratio was 1:1.1 and in this study male-to-female ratio was 1.2:1. The radiographic analysis of the type of impactions showed that mesio-angular impaction constituted 51.0% of cases, followed by disto-angular impaction. The overall analgesic efficacy of the drug combinations was assessed postoperatively by determination of pain intensity using a category rating scale. Facial swelling was measured using a tape measure placed from tragus to gonion to tragus, while interincisal mouth-opening of patients was measured using a vernier calibrated caliper preoperatively and post-operatively.^[18]

Independent T-test did not show any significant difference in reduction of mouth opening (trismus) between the study groups ($P > 0.05$). While this observation does not match with those of previous reports^[26,28,33], the enhanced effect of steroids on mouth-opening may be observed clinically. The time course for pain and facial swelling findings described in the present study are in agreement with those of a recent multicenter trial indicating similar symptoms that reached a maximum at Days 1 or 2 postoperatively and generally resolved at Day 7.^[34,35] The potency and dosage of dexamethasone within the first 24 h (total of 8 mg, as a pre-operative dose) was adequate to enhance the efficacy of diclofenac Na. It appears that steroids are preferably administered preoperatively, extending the coverage up to 24–48 hours after surgery.

Intravenous administration of dexamethasone, as done in the present study, enhances earlier bioavailability in comparison to oral administration.^[9] Additionally, intravenous administration of dexamethasone prior to third molar surgery bears no detrimental impact on wound healing, even in patients predicted to be at high risk for delayed clinical recovery.^[9]

4.2 CONCLUSION

This study demonstrate enhanced effects of co-administered dexamethasone and diclofenac Na on short-term post-operative pain and swelling, compared to diclofenac sodium alone in mandibular third molar surgery. The results of this study demonstrate that although diclofenac sodium is an effective analgesic, but it has a limited effect on post-operative swelling in case of third molar surgery. With this present study we conclude that co-administration of a corticosteroid like dexamethasone and a NSAID like diclofenac sodium is more effective in controlling post-operative pain and swelling after mandibular third molar surgery.

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4.3 RECOMMENDATIONS

By the end of this study we recommend the application of this regimen; the co-administration of dexamethasone and Diclofenac sodium pre-operative to the surgical extraction of a mandibular wisdom teeth in our hospital (KTDH), all others government surgical centers and private centers so that reducing post-operative pain, swelling and improving health-related quality of life.

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