

# The Efficacy of Triamcinalone in Controlling Pain and Swelling after Surgical Extraction of Teeth

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## الخلاصة

**الأهداف:** تهدف الدراسة الى تطبيق مادة (ترايومسينالون اسيتونايد) موضعياً على محجر السن المقلوع جراحياً بغية إجراء تقييم التأثير الخاص بالالتهابات المضادة. **المواد وطرائق العمل:** تم ادراج 40 مريض بصحة جيدة، وقد تراوحت أعمارهم بين (18 - 50) كلا الجنسين. وقد اشترطت الدراسة أن يكون المرضى غير مدخنين، وغير حوامل والمرضعات هذا بالنسبة للاناث. تم تقسيم المرضى الى مجموعتين بالتساوي، المجموعة الأولى ضمت المجموعة التجريبية والمجموعة الثانية كانت مجموعة السيطرة. وتم إجراء القلع الجراحي للمرضى كافة في المجموعة الأولى وتم أيضاً إضافة قطعة من الشاش المعقم بقياس 2 X 2 سم مغمس بمادة ترايومسينالون اسيتونايد (1%)، وتم تغطية المجموعة الأخرى بشاش معقم فقط على ان يتم رفع الشاش المعقم من كلتا المجموعتين بعد 24 ساعة من إجراء العملية. وقد تم قياس مستوى الألم ومستوى الانتفاخ في اليوم الأول والثاني والسابع من إجراء العملية. **النتائج:** بين اختبار (مان وتني) أنه ليس هنالك فرق معنوي في مستوى الألم والانتفاخ لليوم الأول بعد إجراء العملية وبالمقابل كان هنالك اختلاف معنوي في اليوم الثاني والسابع بعد العملية بين المجموعتين. **الاستنتاجات:** بين التطبيق الموضعي لمادة ترايومسينالون اسيتونايد على محجر السن المقلوع انخفاض معنوي في مستوى الألم والانتفاخ في اليوم الثاني والثالث ما بعد العملية في المجموعة الأولى مقارنة بالمجموعة الثانية.

## ABSTRACT

**Aims:** In this study, triamcinalone acetonide was applied topically in the tooth socket following surgical removal of teeth to evaluate its anti-inflammatory effect. **Materials and Methods:** Forty medically fit patients were selected with an age range between (18-50) years of both genders, non smoker, no pregnant or lactating woman. The patients were divided equally into a trial and control group. Surgical extraction was done for all patients. In the first group, the socket was covered with a piece of sterile gauze (2 X 2 cm) impregnated with triamcinalone acetonide ointment %1. In the control group, the extracted socket was covered with sterile gauze only. The sterile gauze was removed 24hrs postoperatively. Postoperative pain and swelling were examined in 1<sup>st</sup>, 2<sup>nd</sup> and 7<sup>th</sup> days. **Results:** Mann-Whitney test revealed no significant difference in the pain level and swelling at the 1st day but with a significant difference in the 2nd and 7th days between both groups. **Conclusions:** The pH of saliva in male patients with (RAU) was more toward acidic pH than normal male subjects.

**Keywords:** Triamcinalone acetonide, surgical extraction, pain, swelling, transalveolar extraction.

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## INTRODUCTION

Pain experienced after oral surgery is an accepted model for the clinical evaluation of analgesic medications <sup>(1)</sup>. This acute pain is mediated by early inflammatory process (edema, fibrin deposition, capillary dilatation, migration of leukocytes into the inflamed tissue and phagocytic activity) proliferation of capillaries

and fibroblast, deposition of collagen fibers and cicatrisation <sup>(2)</sup>.

All these inflammatory reactions are induced by the release of several mediators such as arachidonic acid and its metabolites (e.g., prostaglandins and leukotrienes), platelet activity factors, stromelysin, interleukin -1 and oncogen protein synthesis <sup>(2, 3)</sup>.

Osteotomy associated with the surgical removal of teeth as well as impacted third molar results in so much discomfort that patients are incapable of working for several days. This complication seems to depend on the degree of swelling that is called postoperative edema<sup>(4)</sup>

Most authors agree that trauma and difficulty of surgery play an important role in the development of dry socket<sup>(5-8)</sup> which is a relatively common postoperative complication following the traumatic extraction of permanent teeth.<sup>(9)</sup>

In an era of evidence-based care, few areas of clinical controversy pose as a substantial dilemma to the clinician, as the topic of the alleged factors that are targeted for the various preventive regimens, and the topic of what prophylaxis medicaments and materials, if any, should be placed in an alveolar socket following exodontias<sup>(9)</sup>.

Triamcinalone is a type of corticosteroid used topically for reducing inflammation and an ulcer in the oral cavity in a combination with adhesive substances (usually represented as Kenalog in Orabase 1%). The orabase acts as an adhesive substance to enable triamcinalone to be released slowly and stick to the mucous membrane to achieve its anti-inflammatory effect for long period of time.<sup>(10)</sup>

Aim of the study: To clinically evaluate the effect of triamcinalone acetate used topically on the surgically extracted tooth socket in regard to its anti-inflammatory effect.

## MATERIALS AND METHODS

The study was conducted at the Department of Oral and Maxillofacial Surgery / College of Dentistry / University of Mosul. Forty patients were enrolled in the trial of both gender and different ages ranging between (18-50) years. For the purpose of standardization, the patient selection was based on the following inclusion criteria:

Medically fit patients non smoker, no pregnant or lactating woman

All cases sustained crown fracture of tooth during forceps extraction.

Upper and lower posterior teeth were to be included with the exception of upper and lower wisdom teeth. Duration of sur-

gery ranged from 1.5 min – 10 min and was not to exceed that time.

The patient took no medications like antibiotics for at least one week before the day of surgery. Had no allergy to local anesthetic solution. Following extraction, all patients were instructed for good oral hygiene and simple home care. In case of severe unbearable pain the patients was instructed to take paracetamol tab. 500 mg 1X4. Patients were divided into two groups:

Group I: In this group, socket was covered with a sterile piece of gauze (2 X 2 cm) impregnated with 1 cm Triamcinalone ointment 1% with orabase (Unipharma Syria) to be removed following 24hr.

Group II: In this group, the socket was covered with a sterile piece of gauze (2 X 2 cm) only and was to be removed following 24hr.

### Pain and Swelling Assessment

Pain and swelling assessment for each patient was examined in the 1st, 2nd and 7th days after extraction according to the following criteria:

Pain: This was recorded by the patient himself using Visual Analogue Scale (VAS)<sup>(11,12)</sup> ranging from 0 to 10 where 0 stood for no pain, 1-3 = mild pain, 4-6 moderate pain and 7-10 severe unbearable pain.

Swelling: post-operative swelling was evaluated on the basis of clinical observation and as suggested by Sabur<sup>(13)</sup>:

0 = No swelling.

1 = Oedema that involves the alveolar mucosa buccally and / lingually (intraoral).

2 = Oedema that involves the alveolar mucosa buccally and / lingually and cheek to the lower border of mandible (extraoral).

3 = Oedema that involves the alveolar mucosa buccally and / lingually and cheek (extraoral) below the lower border of mandible.

## RESULT

Table (1) showed the result of pain in both groups. In the trial (group I) group 55% of patients developed mild pain in the 1<sup>st</sup> day, while in the control group (group II) the percentage was 30%. Moderate pain was recorded in 45% of patients in trial group while %60 in the control one. On

the other hand, there were no cases that developed severe or very severe pain in the trial group, while in control group, the percentage was 5% only.

In the 2<sup>nd</sup> post-operative day 95% of patients developed mild pain while in the control group the percentage was 30%. Moderate pain appeared in 5% of the trial group and 35% in the control group. Severe and very severe pain did not appear in the trial group while in the control group the result shows 10% and 25% respectively. After one week of surgery (in the day

7<sup>th</sup>), no patients developed any degree of pain in the trial group while 70% of patients with mild and 15% with moderate and very severe pain in the control group. In addition, three patients developed dry socket the control group.

Statistical analysis using Mann-Whitney test showed no significant difference between the two groups in the 1<sup>st</sup> day while significant difference appeared in the 2<sup>nd</sup> and 7<sup>th</sup> day at  $P \leq 0.05$ . This is shown in table (1).

Table (1): Frequency and percentage distribution of post-operative pain in experimental and control groups.

GROUP	CATEGORY	1 <sup>ST</sup> DAY		2 <sup>ND</sup> DAY		7 <sup>TH</sup> DAY	
Trial Group I	Nil	0	0 %	0	0 %	20	100 %
	Mild	11	55 %	19	95 %	0	0 %
	Moderate	9	45 %	1	5 %	0	0 %
	Severe	0	0 %	0	0 %	0	0 %
	V.severe	0	0 %	0	0 %	0	0 %
Control Group II	Nil	0	0 %	0	0 %	0	0 %
	Mild	6	30 %	6	30 %	14	70 %
	Moderate	12	60 %	7	35 %	3	15 %
	Severe	1	5 %	2	10 %	0	0 %
	V.severe	1	5 %	5	25 %	3	15 %

1st day: Mann-Whitney (U) = 141.00, Z- value = -1.808, P- value = 0.071, 2nd day: Mann-Whitney (U) = 66.50, Z -value = -4.180, P- value = 0.000\*, 7th day: Mann-Whitney (U) = 0.00, Z -value = -5.932, P -value = 0.000\*, \* Significant difference between experimental and control groups existed at  $P \leq 0.05$  level of significance.

The degree of swelling among the patients in both groups is shown in table (2). In the 1st post-operative day 40% and 50% of patients showed no sign of swelling in the trial and control groups respectively. This result showed no great difference for degree (1) swelling between groups while for degree (2) and (3) the percentage decreased in the trial and in the control groups. In the 2nd day, 70% of patients in the trial group showed no swelling, while in the control group the percentage was 20%. In the trial group, only 5% of patients developed degree (1) of swelling while in the control group the percentage was 60%. Degrees (2) and (3) of

swelling appeared in the trial group in 20% and 5% of patients respectively. On the other hand, these degrees appeared in 10% of patients in the control group. In the 7th day of surgery all patients in the trial group showed no sign of swelling while in the control group, 70% with no swelling and 30% with degree (1) swelling. Statistical analysis using Mann-Whitney test showed no significant difference between the two groups at the 1st day interval while a significant differences was noticed at the 2nd and 7th day at  $P \leq 0.05$ . Table (2).

Table (2): Frequency and percentage distribution of post-operative swelling in experimental and control groups.

Group	Category	1 <sup>st</sup> day		2 <sup>nd</sup> day		7 <sup>th</sup> day	
Trial Group I	0	8	40 %	14	70 %	20	100 %
	1	9	45 %	1	5 %	0	0 %
	2	3	15 %	4	20 %	0	0 %
	3	0	0 %	1	5 %	0	0 %
Control Group II	0	10	50 %	4	20 %	14	70 %
	1	8	40 %	12	60 %	6	30 %
	2	2	10 %	2	10 %	0	0 %
	3	0	0 %	2	10 %	0	0 %

1<sup>st</sup> day: Mann-Whitney (U) = 177.00, Z- value = -0.683, P- value = 0.495

2<sup>nd</sup> day: Mann-Whitney (U) = 125.0, Z -value = -2.173, P- value = 0.030\*

7<sup>th</sup> day: Mann-Whitney (U) = 0.140, Z -value = -2.623, P -value = 0.009\*

### DISCUSSION

In response to surgical intervention, an inflammatory process, which includes a complex series of biochemical and cellular events are activated. Meanwhile, several pain – inducing mediators, such as prostaglandin, leukotriens, histamine and interleukin – 1 are released.<sup>(14)</sup>

In this study, 1% triamcinalone in orabase produced a reduction in pain and swelling in the 2nd and 7th day following surgical extraction when applied topically to the extracted socket compared to the control ( $p \leq 0.05$ ). This effect can be explained by the long, persisting 24-hour duration of action through complete absorption of triamcinalone from its site of application.<sup>(15, 16)</sup> Pelletier et al<sup>(2)</sup> and Robert et al<sup>(17)</sup> stated that the mean elimination half-life of triamcinalone was 4-6 day in knee joint. This observation regarding the effect may explain the significant reduction in pain and swelling at the 2nd and 7th post-operative day with the advantages of a minimal risk of single dose of corticosteroids.<sup>(2, 17)</sup>

Markiewicz et al<sup>(18)</sup> found that pre-operative administration of corticosteroid produce a mild to moderate reduction in edema and improvement in range of motion following third molar removal.<sup>(18)</sup>

Pre-operative use of corticosteroid has been advocated for reduction of pain edema and trismus following oral surgical procedures. Complications induced by pre-operative corticosteroid use such as adren-

al suppression and delayed wound healing appeared to be minimal.<sup>(19)</sup>

Topical application of 4 mg triamcinalone acetone intraocularly found to be more effective when used intraoperatively than intraoperative intravenous injection of methylprednisolone in preventing post-operative complications after cataract surgery in patients with juvenile idiopathic arthritis.<sup>(20)</sup> This finding was in agreement with the finding obtained in this study where topical application of triamcinalone produced a significant reduction in pain and swelling at the 2nd and 7th postoperative day following surgical extraction with a minimal risk of systemic adverse effect of corticosteroids usage. Unfortunately speaking, to our knowledge, no literature was available to compare with the current clinical trial.

### CONCLUSIONS

Topical application of triamcinalone acetone to a surgically extracted socket produced a significant reduction in pain and swelling at the 2nd and 7th postoperative days.

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