

# Efficacy of Tranexemic Acid in Preventing Alveolar Osteitis After Third Molar Extraction

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## ABSTRACT

**Objective:** To determine the efficacy of tranexemic acid in preventing alveolar osteitis after third molar extraction. **Study Design:** Randomized control trial. **Place and Duration of Study:** June 2013 to June 2014. Oral and Maxillofacial Surgery department, Dental section, Punjab Medical College, Faisalabad. **Materials and Methods:** Thirty patients, between the ages 18-35 years without any gender discrimination, presenting for removal of bilateral mandibular impacted third molars were included in the study. One side was the study group (Group A) and the other side acted as control (Group B). Group A was given Inj Transamine 500mg IV 10 minutes before surgical removal however no pre-operative medication was given to group B. The rest of the procedure was carried out in a standard fashion in both the groups. The frequency of

dry socket was assessed in both the groups and compared using Chi Square test. **Results:** The age ranged from 18-35 years with a mean age of  $23.3 \pm 3.5$  years. Out of these 30 patients 18 were males and 12 females with an overall M:F ratio of 1.5:1. Eight patients out of the 18 males were smokers and 3 females out of 12 were using oral contraceptives. Two patient (6.7%) developed dry socket in Group A, and 4 (13.3%) developed dry socket in Group B. Although the control group showed a greater frequency of dry socket but overall the results were statistically insignificant ( $P\text{-value} > 0.05$ ). **Conclusion:** Although IV tranexemic acid cannot prevent dry socket completely however it can decrease the incidence of dry socket formation and its use may be considered in patients who show an increased predisposition towards formation of dry socket. **Keywords:** Third molar, Alveolar Osteitis, Tranexemic Acid

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## INTRODUCTION

Alveolar osteitis (AO) or dry socket is a common finding in dental practice which is faced by dental surgeons in general and oral surgeons in particular.<sup>1</sup> It is a painful condition which occurs after tooth extraction as a result of clot dislodgement or clot dissolution before the wound healing has taken place.<sup>2</sup>

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The incidence of dry socket ranges from 2-15% according to various studies and this incidence further increases to 30-35% after surgical removal of mandibular wisdom teeth.

A multitude of predisposing factors have been identified by various authors and clinicians. Some worth mentioning are, smoking, use of oral contraceptives, mandibular extractions specifically third molars, traumatic extraction with gingival tears, continuous spitting and rinsing after extraction and so on.<sup>3</sup>

Tranexemic acid is a commonly used, readily available anti-fibrinolytic/hemostatic agent which finds its uses in a lot of trauma and surgical situations.<sup>4</sup> It exerts its mechanism of action by blocking the active sites on plasminogen, thus

preventing its conversion to plasmin, which is a molecule required to degrade fibrin, which is a protein responsible to form the framework of blood clot. So in this way it helps stop bleeding by stabilizing the fibrin network indirectly.<sup>5,6</sup>

The most accepted theory for formation of AO is dissolution or dislodgement of blood clot before the formation of granulation tissue leading to a painful empty cavity, filled with necrotic material and showing delayed granulation tissue formation.<sup>7</sup> This theory forms the rationale for the current study where it is proposed that pre-operative use of tranexemic acid should help in stabilization of the blood clot and thus decreasing the incidence of AO after the extraction.

## MATERIALS & METHODS

The study was conducted in the department of oral and maxillofacial surgery of Dental Section Punjab Medical College Faisalabad, from June 2013 to June 2014. All healthy patients between the ages of 18 to 35 years having bilateral impacted mandibular third molars were included in the study. Thorough history was obtained and the patients were specifically inquired about smoking and use of oral contraceptives. Willingness to take part in the study was obtained on specially designed consent forms.

These patients were divided into two groups by lottery method. One side acted as study group (Group A) and the other side acted as control (Group B). In the study group patients were given tranaxemic acid (Transamin Hilton Pharmaceutical) 500mg IV 10 minutes before the procedure however no pre-medication was given in the control group. The rest of the procedure was carried out in a traditional fashion in both the

groups. Standard envelop incision was used to remove the teeth. All the extractions were carried out by consultants in order to remove operator bias. Impactions were classified according to Winter's classification as either mesioangular, distoangular, horizontal, vertical, bucco-lingual, transverse and inverted. Operating time was noted from the incision to the last stitch. Any mucosal tears occurring during the procedure were stitched and later on noted in the patient charts. Extraction sites were stitched with silk which was removed after 7 days. Patients were recalled on third and seventh post op day. Patients were considered to be having dry socket if they complained of pain along with an extraction socket devoid of clot, filled with necrotic debris, with or without foul smell. Patients with dry socket were managed using warm saline irrigation along with placement of chlorhexidine oral gel in the socket wound. The extractions were carried out on one side at a time and the second side was operated after a gap period of minimum two weeks. The patient who did not report for the second extraction was excluded from the study.

All the acquired data was gathered on specially designed forms and was analysed using SPSS (version 18). Frequency and percentages were presented in the form of charts. Chi Square test was used and P value < 0.05 was taken as significant.

## RESULTS

Thirty patients who required bilateral impactions were included in the study. The age ranged from 18-35 years with a mean age of 23.3±3.5 years. Out of these 30 patients 18 were males and 12 females with an overall M:F ratio of 1.5:1.

Sr. No	Parameters	Group (a)	Group (b)
1.	Classification Mesioangular	12	11
	Horizontal	07	06
	Vertical	05	06
	Distoangular	05	06
	Inverted	01	-
	Transverse	-	-
	Bucco-Lingual	-	01
2.	Average Operating Time	36 minutes	34 minutes
3.	Mucosal tear	02	01
4.	Dry Socket	02 (6.7%)	04 (13.3%)

Table showing the results of the study (P-value >0.05)

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Eight patients out of the 18 males were smokers and 3 females out of 12 were using oral contraceptives. All the parameters are shown in the table given below. Although the control group showed a greater frequency of dry socket but overall the results were statistically insignificant (P-value>0.05).

## DISCUSSION

Alveolar osteitis, a fairly common sequela of tooth extraction, refers to a painful condition occurring after tooth extraction due to clot dislodgement or dissolution before the healing has taken place. The socket fills up with necrotic debris, has inflamed margins and usually gives a fetid odor.<sup>8</sup> The incidence further increases if the tooth to be extracted is in mandible and requires surgical removal.<sup>9</sup>

Tranexemic acid is a well-known, readily available hemostatic agent that finds its use in a lot of trauma situations, surgical procedures and a variety of other medical problems where prolonged bleeding is expected.<sup>10</sup> It exerts its hemostatic properties by blocking the active sites on plasminogen and not allowing it to convert to plasmin whose ultimate role is to dissolve fibrin. In this way it stabilizes fibrin and prevents its lysis.<sup>6,11</sup>

Keeping in mind this mechanism of action, we used tranexemic acid prior to embarking on a surgical removal of lower wisdom teeth. In our study group, we administered tranexemic acid IV 10 minutes before commencing with the procedure. Review of the literature shows that clinicians and surgeons have attempted many agents for preventing and later treating this afflicting condition. Some of the agents that have been used and reported in literature are topical as well as systemic antibiotics, para-hydroxybenzoic acid, steroids, chlorhexidine gels and mouthwashes, topical application of tranexemic acid and eugenol containing dressings.<sup>1,3,8,9</sup> None of the above mentioned agent has been successful in completely abolishing the dry socket and authors have shown conflicting results.

The incidence of dry socket in surgical extractions is reported to be 10 times more than simple extractions. The overall incidence ranges from 1-35% in various studies.<sup>12,13</sup> Our study showed an

overall frequency about 10% (6 cases of AO in 60 extractions- 30 in each group). We observed 2 cases of AO in our study group (6.7%) and 4 cases of AO in control group (13.3%). In the 2 cases of AO in study group, one was smoker and the other got a gingival tear while extraction. In our study group, out of 4 cases, one occurred in smoker, one had a tear during extraction and one was seen in a patient using OCP.

Although there was a decreased frequency of AO in our study group yet we could not obtain statistically significant results. The reason is a relatively small sample size. If this study can be carried out in a large population, we believe that statistically significant results can be achieved. Within the confines of the study it is not possible to derive a significant co-relation with any predisposing factors.

## CONCLUSION

Although IV tranexemic acid cannot prevent dry socket completely however it can decrease the incidence of dry socket formation and its use may be considered in patients who show an increased predisposition towards formation of dry socket.

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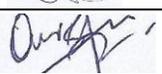
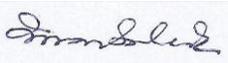
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