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AWARENESS ON HAEMOSTATIC DRUGS IN MANAGEMENT OF BLEEDING SOCKETS AMONG DENTAL STUDENTS

Article: Original Research
Running title: Awareness on haemostatic drugs

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ABSTRACT: *The aim of this study is to determine the understanding regarding haemostatic drugs in management of bleeding sockets among dental students. The purpose of this study is to create awareness and determine the understanding of haemostatic drugs in management of bleeding sockets among dental students. This study was conducted based on a questionnaire which consisted of 10 questions through a web-linked application called Survey Monkey. A convenient sample size of 100 consecutive dental students who are currently practicing in Chennai participated in the study. As an overall result, most of the participants are aware of haemostatic drugs in management of bleeding sockets. As a conclusion, the awareness on haemostatic drugs in management of bleeding sockets also its role and development among dental students in Chennai is adequate but certain knowledge has to be brushed up among them for a higher level. Furthermore, they need to be trained on these grounds to help them treat their patients with more consent and awareness.*

KEYWORDS:*bleeding; socket; haemostatic, drugs; dental; student*

1. INTRODUCTION

Socket bleeding is a common situation faced by many patients who underwent extraction of a tooth.[1] It is often complaint got by the Emergency Department in the late evening or night when the patient is unable to contact their dentist after they perform exodontia.[2] Socket that bleeds again after a few hours of post extraction, are normally due to ended span life of the vasoconstrictor effect which is obtained from local anesthetic solution used for anesthesia. The application of direct pressure over the bleeding site by having the patient bite down on a folded piece of moist gauze almost always controls post-extraction bleeding.[3]

Usually, after a exodontia have been perform the patients are advised to not drink any liquid through a straw, spitting out the blood or saliva, gargling, or smoking for next minimally 12 hour.[4] These are the activities which induces negative pressure within the oral cavity simultaneously will remove the clot from the extraction site.[5] Patient who touches the extraction site with their tongue will lead to a mechanical disruption of the blood clot. A bleeding will also

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prolonged at the side of extraction in patients who are under the usage of aspirin products, anticoagulants, broad-spectrum antibiotics, alcohol, and antineoplastic medications.[6]

A practitioner also has to be aware of symptoms and examine for the signs of liver disease, hypertension, or hematologic disorders in patients with prolonged bleeding sockets. Underlying and undiagnosed coagulopathy can be the causative agent for post extraction bleeding in few patients.[7] Difficulty in achieving a complete homeostasis within the oral cavity can be experienced due to the highly vascular nature of the tissues. It also can be due to exposure of the open socket to the patient's exploring tongue and fingers.[8]

Low level ooze for 12-24 hours after exodontia is normal in a healthy patient. It acts as an organized clot in the tooth socket.[7] The patient will have mildly blood-stained saliva that will decrease over time. Failure of haemostatic in patients will be confirmed when they have active bleeding beyond this point and often requires investigations and treatment. Significant, it is essential to establish the degree of active bleeding and consider any predisposing factors as well as assessing how vulnerable the patient is to haemodynamic changes, such as extremes of age.[9]

In dentistry, the common haemostatic drugs will be prescribed are aminocaproic acid (ACA) and tranexamic acid (TXA) are drugs utilized for enhancing hemostasis, particularly when fibrinolysis contributes to hemorrhaging.[10] Fibrinolytic bleeding can be correlated with post-surgical problems which associated with hematologic disorders such as thrombocytopenia, hepatic cirrhosis, hemophilia and neoplastic disease.[11] In 1957, Okamoto was known to be the first to describe tranexamic acid and aminocaproic acid with synthetic lysine analogues. Both of these drugs are currently being used globally as anti-fibrinolytic drugs. There drugs act as reversely blocking the lysine binding sites of plasminogen, thus preventing its activation to plasmin, and thus stops the lysis of polymerized fibrin.[12]

In previous literatures, the department of oral and maxillofacial and periodontics have revealed that ACA and TXA are useful hemostasis adjuncts in dental surgeries of patients with hemophilia and other bleeding dyscrasias.[13] Various case reports and studies have noted relative success with regard to hemophilia, alcoholic cirrhosis of the liver, hereditary angioedema, Glanzmann's thrombasthenia, Bernard-Soulier syndrome, and Trousseau syndrome.

The third stage of hemostasis is the coagulation phase which is dependent upon the generation of thrombin and fibrin. Multiple proteins synthesized by the liver are necessary which include fibrinogen, prothrombin, and factors V, VII, IX, X, XI, XII, and XIII. There are three separate pathways involved as following:

- Intrinsic
- Extrinsic
- Activating common pathway

The beginning of the fibrinolytic system involves the activation of factor XII to factor XIIa. Factor XIIa along with high molecular weight kininogen is necessary for the conversion of prekallikrein to kallikrein. Kallikrein (along with plasminogen activator) is necessary for the conversion of plasminogen to plasmin.[14] Plasmin is necessary for the conversion of fibrin to fibrin degradation products. Therefore, this study was conducted to determine the awareness of haemostatic drugs in management of bleeding sockets among dental students.

2. MATERIAL AND METHODS

A convenient sample size of 100 consecutive dental students who are currently pursuing in Saveetha Dental College, Chennai participated in the study. A cross-sectional observational online based study was conducted. Questionnaire was

constructed on the Survey Monkey website with dichotomous questions. The questionnaire consists of 8 questions as shown in Table 1. A link containing these questionnaires was shared with all the participants and required them to answer the questions. All the responses were analysed and recorded.

QUESTIONS	
1.	*After an extraction, have you ever experienced a patient with prolonged bleeding (immediately after the extraction or post extraction?*
2.	*Do you know how to manage a bleeding socket?*
3.	*Are you aware about the importance of haemostatic drug?*
4.	*What is the main cause for bleeding sockets?*
5.	*Which are the most haemostatic drugs in a management of bleeding socket?*
6.	*What is the mechanism of action of haemostatic drugs?*
7.	*What are the chemical methods of haemostatic drugs?*
8.	*What is the optimum time needed for bleeding to stop after a tooth has been extracted?*

Table 1 shows dichotomous questions asked in questionnaires.

3. RESULTS AND DISCUSSION

According figure 1, 56% of the participants have claimed that they have been experienced with prolonged bleeding after extraction. Remaining 44% of them have not experienced any incidences of prolonged bleeding post extraction. Surprisingly, 66% of the participants revealed that they are aware of managing bleeding sockets. Remaining 34% of them were not aware of bleeding socket management, as shown in figure 2.

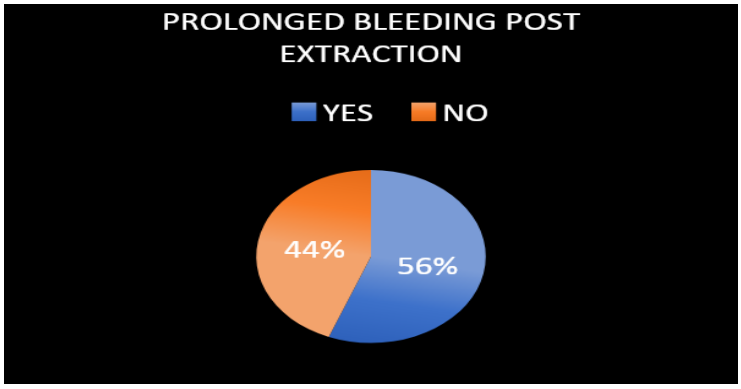

FIGURE 1: shows the percentage of participants who have experienced with prolonged bleeding after extraction

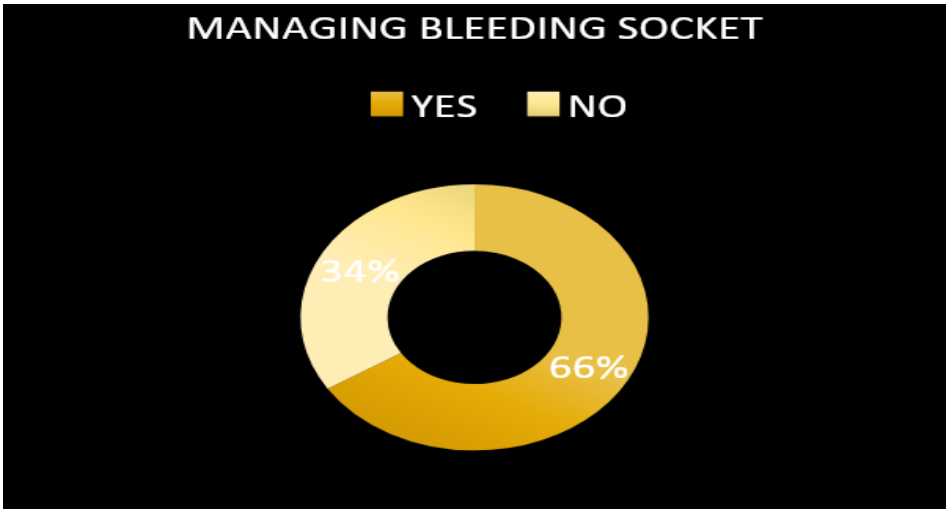

FIGURE 2: shows the percentage of participants who aware of managing bleeding socket

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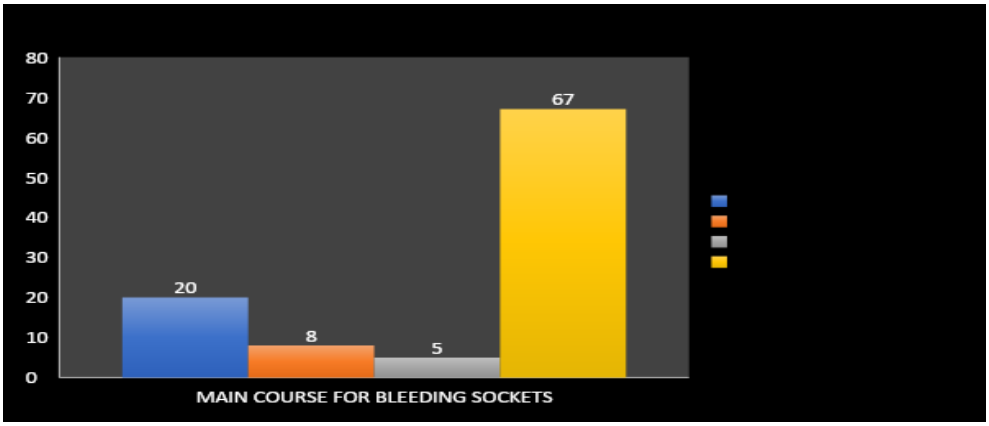

FIGURE 3: shows the answers of participants for the question asked about main course of bleeding sockets

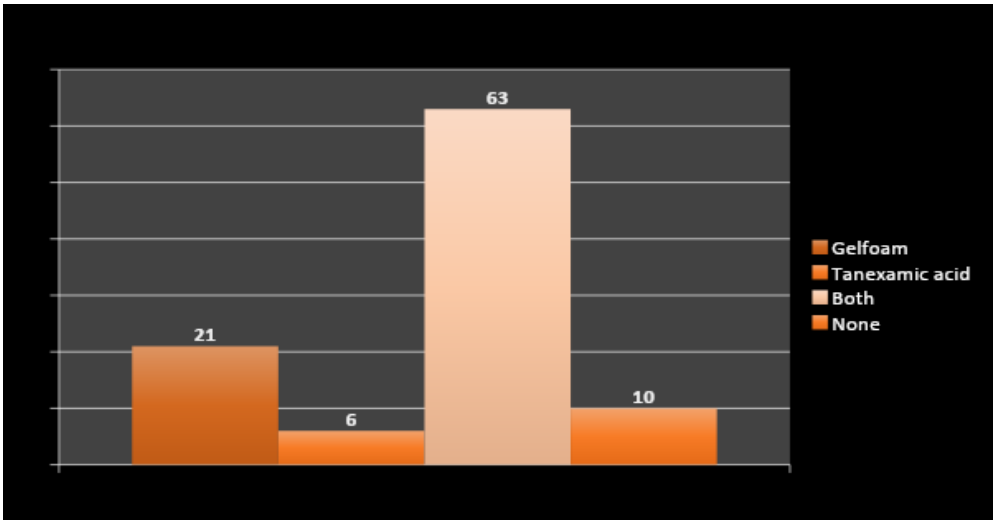

FIGURE 4: shows percentage of most used hemostatic drugs in management of bleeding socket by participants

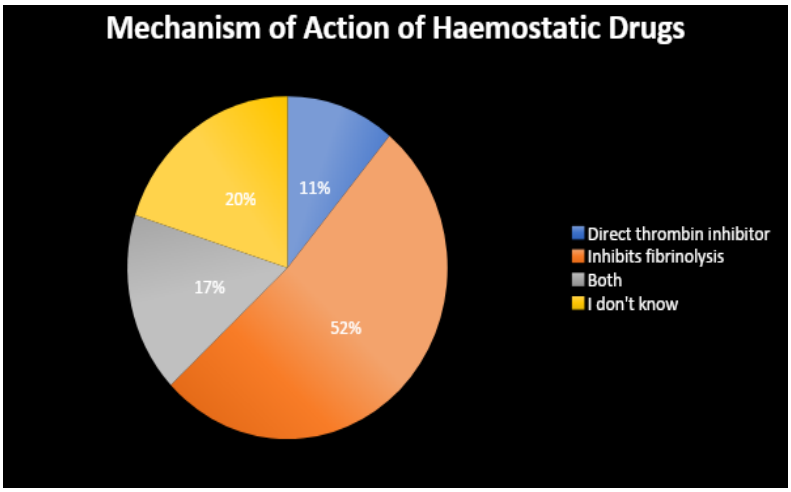

FIGURE 5: shows the knowledge of participants regarding the mechanism of action of haemostatic drugs

69% of them were aware about the importance of hemostatic drugs. Remaining 31% of them seem to be unaware of the importance as they choose the option 'No' for this question. According to figure 3, 20% of the participants choose clotting factor deficiencies as the main cause for bleeding sockets. Next, 8% and 5% of them chose vascular anomalies and traumatic extraction, respectively. Majority, 67% answered correctly by choosing all the options given.

Figure 4 showed answers by the participants for the question asked about most used haemostatic drugs in a management of bleeding socket. About 21% of them chose gelfoam and another 6% chose tranexamic acid. Remaining 63% of them chose both the drugs and another 10% chose the 'none' option. Following question was asked about the mechanism of action of haemostatic drugs and 52% of them answered correctly by choosing inhibition of fibrinolysis. About 11% of them chose the option 'direct thrombin inhibitor', as shown in figure 5. Remaining 17% and 20% chose the option 'both' and 'I don't know', respectively.

When asked about chemical methods of haemostatic drugs, about 55% of them answered correctly by choosing both epinephrine and protamine. Remaining 20% and 4% only chose epinephrine and protamine separately, respectively. 21% of them have no clue about the question and chose the option 'I don't know'. Finally, a question was asked regarding the optimum time needed for bleeding to stop after a tooth extraction and 59% of the participants answered 12-24 hours. Remaining 2% and 11% answered more than 24 hours and less than 12 hours, respectively. About 28% of them had less knowledge about it and chose the 'I don't know option

According to a previous study conducted by Suhas et al[15], they concluded that 78% of the students are familiar about hemostatic agents while 22% are not. Whereas, in current study only 69% of them are aware of hemostatic agents which is lesser than previous literature. Hemostats are common agents found in a first aid kit. Usage of these agents in a dental setup can be beneficial to both clinician and the patient. From the survey conducted, it could be inferred that though 77.9% of the study group that is undergraduate dental students were aware of hemostatic agents only 27.6% preferred to use them in their practice. This clearly shows the lack of awareness and knowledge.

In another study conducted by Danielle Blinden et al[16], evaluated postoperative bleeding in patients treated with oral anticoagulant drugs who underwent dental extractions without interruption of the treatment and to compare the effect of three different hemostatic modalities. The study showed the hemostatic agents were very useful in their study compared to topical hemostatic agents. Next, a study by Carter et al[17], compared the effectiveness of tranexamic acid mouthwash and autologous fibrin glue in controlling bleeding after dental extraction in patients taking warfarin as an anticoagulant. In that study the have concluded that statistically, there was no significant difference between both the groups.

According to Kiruthika et al[18], they concluded that local hemostatic agents are additionally more effective than the conventional suturing technique in post-operative bleeding. There is no statistically significant difference among different local hemostatic agents used to control bleeding in dental extraction sockets. Application of pressure is the most common and widely used method to arrest bleeding. Usage of hemostatic agents along with technique can provide a better working field and less blood loss. In the current study, 66% of the participants are aware about the management of bleeding sockets and 55% of them are aware of the chemical reaction of it.

Side effects of hemostatic agents are minimally limited to skin irritations, nausea, and hallucinations in rare cases. In a dental scenario, usage of hemostatic agents along with other techniques can be beneficial to arrest bleeding and bring about hemostasis during tooth extractions and other minor or major surgical procedures. Only, usage of hemostatic agents is not advised though. Direct application of pressure to arrest bleeding is recommended as the first line treatment. There is

also a myth that hemostatic agents cause burns. Actually, the first generation quikclot contained zeolite which absorbs water and gives out heat leading to burns; however, these products have been discontinued and replaced with new generations of quickly.[19]

Other products such as hemocon and celox have been derived from chitosan which is derived from shellfish. This may raise questions regarding allergic reactions. However, no such cases have been reported even with those who have seafood allergy. Celox bandages coated with chitosan powder are commonly used. They are easy to handle and the chitosan is readily accepted by the body unlike other minerals such as kaolin.[20]

Hemcon is a mucoadhesive pad also coated with chitosan can be packed into wounds similar to celox; however, hemcon cannot be used for deeper wounds. On comparison of different products, it was surprisingly found that standard gauze provided the same hemostatic effect as others. Most importantly, it is crucial to take note that hemostatic agents are not the first line of treatment to arrest bleeding, they have to be used in combination with direct application of pressure to arrest bleeding. In case of trauma where is huge amount of blood loss, usage of hemostatic agents could provide that slight time advantage which could be lifesaving.[21]

4. CONCLUSION

Within the limitations of the current study, it can be concluded that the majority of the dental students were lack of awareness regarding hemostatic agents in dentistry. The dental students have to be assessed more on hemostatic baseline to enhance their awareness and knowledge on this topic. In future scope, larger sample size with multi centered study has to be conducted to get a positive consensus for this study.

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CONFLICT OF INTEREST
The authors declare that there was no conflict of interest

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