Risk of bleeding in patients with cardiovascular disease on aspirin undergoing tooth extraction

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ABSTRACT

Background and purpose: Aspirin is the most frequently used preventive and therapeutic drug for patients with cardiovascular diseases because of its antiplatelet property, which might lead to the risk of excessive bleeding during the surgery. The purpose of the study is to analyze if there is a need to discontinue low dose antiplatelet therapy before dental extraction.

Methodology: The study samples consisted of 25 patients receiving 100 milligrams of aspirin daily and were scheduled to undergo dental extractions. Each patient acted as a control for himself, wherein an extraction was performed on a patient when aspirin was not discontinued and a second extraction after discontinuing aspirin for 72 hours prior the procedure. The bleeding time, clotting time, platelet count and INR were measured preoperatively at both the appointments and the amount of blood loss during the procedure was assessed.

Results: The mean blood loss at the first appointment for the patients was 5.78 ml while it was 1.18 ml at the second appointment. The difference was statistically significant with a t – value of 3.2. However, the blood loss in patients during the first appointment was easily managed using local hemostatic measures which prevent any grave bleeding complication.

Conclusion: From the observation in this study it can be stated that the low dose aspirin therapy can be continued prior to extraction procedure in the oral cavity without the fear of excessive intra-operative and post operative bleeding.

Key words: Cardiovascular Disease, Aspirin, Tooth Extraction, Blood Loss

INTRODUCTION

In the modern era, a majority of the population in the age group of 50 and above shows a tendency towards developing cardiovascular disease, mainly due to imbalanced diet and a lack of physical activity. These patients are usually on aspirin therapy that helps prevent the thromboembolic events to which these patients are susceptible. Aspirin, Acetyl Salicylic Acid (ASA), irreversibly inhibits the enzyme cyclooxygenase-1 thereby leading to the blockage of the synthesis of thromboxane A2 whichis required for platelet aggregation.[1] Thus aspirin exerts its antiplatelet activity by preventing platelet aggregation and thereby avoiding thrombus formation within the blood stream. This prevents episode of thrombosis and vascular ischemic events.[2] The dental management of these patients, who require an extraction of tooth is an issue of concern, as the aspirin may lead to intra operative and post operative uncontrolled excessive bleeding due to its anti platelet action. But altering the dosage or discontinuing it 7-10 days prior to the procedure may predispose the patient to an increase risk of developing an myocardial infarction or stroke, which is life threatening.[3] Few authors have established that the aspirin therapy in patients with cardiovascular diseases need not be discontinued and dental procedures like simple extractions may be performed without the fear of excessive bleeding intra-operative or post-operatively.

This study intends to evaluate the need to discontinue the low dose aspirin prior to dental extraction in patients with cardiovascular disease by comparing the net blood loss and evaluating the effectiveness of local hemostatic procedures to avoid excessive bleeding during and after the procedure in a patient with and without discontinuation of aspirin.

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PATIENTS AND METHODS

Twenty five patients presenting to the oral and maxillofacial surgery OPD, diagnosed with chronic generalized periodontitis and giving a history of cardiovascular diseases, receiving 100 mg of aspirin daily were included in the study. All subjects were advised for multiple mandibular molar tooth extraction. Written informed consent and physician

opinion was taken from every patient prior to their inclusion in the study and ethical clearance was achieved from the national research committee. Each patient acted both as a control as well as a case for the study.

Inclusion Criterion-

1. Patients in the age group of 55-75 years were included in the study
2. Tooth included were mandibular molars
3. Extraction of teeth for chronic generalized periodontitis where other restorative procedures were not possible and indicated for extraction.
4. Grade 1 hypertensive patients

Exclusion Criterion-

1. Patients on anticoagulants like heparin, warfarin sodium.
2. Patients on any other antiplatelet therapy.
3. Patients on steroids, hormonal therapy and any drug that interacts with antiplatelet drugs.
4. Patients suffering with diabetes mellitus.
5. Anemic patients.
6. Non-alcoholics, Non-smokers.
7. Patients with any other bleeding disorders.
8. Patients having hepatic and renal dysfunction.

Prior to fixing an appointment, the blood pressure was recorded and bleeding time, clotting time, platelet count and INR were assessed. Only after reports obtained were within normal limits, the patients were prescribed antibiotics in accordance to AHA guidelines in order to preventsubacute bacterial endocarditis.[4] (Table 1) the patient was then subjected to extraction of single mandibular molar tooth.

Intra operative bleeding was effectively controlled by local haemostatic procedures such as pressure pack and suture application. The amount of blood loss during the procedure was estimated. Thirty minutes post procedure, the operated site was checked for any ooz or bleed. The patient was prescribed paracetemol 500 mg TID along with prophylactic antibiotics prescribed earlier and was advised to discontinue aspirin for a period of three days and return on the fourth day, for extraction of the other mandibular molar.

The procedure was done by the same operator and the amount of blood loss during the procedure was estimated along with the effectiveness of local hemostatic procedure. A comparison between the blood losses as well as the effectiveness of local hemostatic procedure to prevent bleeding in both appointments was done.

Surgical Procedure:

All the extractions were performed by the same surgeon on an outpatient basis under local anesthesia using plain 2% lignocaine hydrochloride. The use of suction was avoided during the procedure to allow an accurate estimate of the blood loss. The surgical field was kept clear of blood with gauze. Saliva contamination was avoided by placing gauze in the sub mandibular and parotid duct regions.

An electronic weighing scale was used to weigh the surgical gauze pre-operatively. Post operatively, the blood soaked gauze was weighed immediately to avoid the loss by evaporation. It is customarily assumed that 1 ml. of blood weighs 1 gram.**[5]** Therefore the calculated difference of weight between the gauze preoperatively and post-operatively was converted directly to a volume measurement of blood loss.

A figure of eight suture was placed at the surgical site with 3/0 black braided silk and a pressure pack with a sterile gauze was placed for 30 minutes and re assessed for bleeding. Local hemostatic agents were kept ready to control any untoward bleeding encountered.

On comparing the control of blood loss between both the appointments of a single patient, it was observed that there was no need for an additional local hemostatic measure in the first appointment and bleeding was very well controlled as it was in second appointment wherein the patient was asked to discontinue aspirin intake 72 hours prior to operative procedure. Patients were discharged after giving strict post-extraction instructions. Patients were followed up for 24, 48 and 72 hours after extraction of teeth for possible bleeding episodes and there were no reported bleeding episodes.

RESULTS

The mean blood loss at the first appointment for the patients was 5.78; with a standard deviation of 5.46, whereas it was 1.18 with a standard deviation of 1.13ml. The difference was statistically significant with a t – value of 3.21 inferring that a increased amount of bleeding was noted at the first appointment as compared to the second appointment in the same patient. (Table 2)

The mean bleeding time at first appointment was found to be 130.8 seconds with a standard deviation of 17.59 which was slightly increased as compared to the mean bleeding time of 114.6 seconds with standard deviation of 18.11 at second appointment where aspirin was discontinued, which was statistically significant with a t – value of 4.23. (Table 3) The mean INR recorded at first appointment was 1.18 +/- 0.25 in contrast to the mean INR of 1.08 +/-0.10 which was observed in each patient after discontinuing aspirin prior to extraction procedure, which was also statistically significant with a t-value of 3.14. (Table 4)

However, the clotting time and platelet count were within normal range and the difference between both groups was not statistically significant.

Table 1: AHA guidelines for prevention of subacute bacterial endocarditis

Situation	Agents	Adult Dosage (Single Dose 30 to 60 min Before Procedure)
Oral	Amoxicillin	2 gram
Unable to take oral medication	Ampicillin OR Cefazolin or ceftriaxone	2 g IM or IV 1 g IM or IV
Allergic to penicillins—oral	Cephalexin OR Clindamycin OR Azithromycin or clarithromycin	2 g 600 mg 500 mg
Allergic to penicillins and unable to take oral medication	Cefazolin or ceftriaxone OR Clindamycin	1 g IM or IV 600 mg IM or IV

Table 2: Comparison of mean blood loss at both appointments

	Mean blood loss (in ml)	Standard deviation	Range
Patients on aspirin (1st appointment)	5.78	5.46	3.03- 7.66
Patients discontinued aspirin (2nd appointment)	1.18	1.13	4.03-6.95

Table 3: Comparison of mean bleeding time at both appointments

	Mean Bleeding time (in seconds)	**Standard deviation**	**Range**
Patients on aspirin (1st appointment)	130.8	17.59	105- 165
Patients discontinued aspirin (2nd appointment)	114.6	18.11	85- 150

Table 4: Comparison of mean INR at both appointments

	Mean INR (in seconds)	**Standard deviation**	**Range**
Patients on aspirin (1st appointment)	1.18	0.25	1.00- 1.35
Patients discontinued aspirin (2nd appointment)	1.08	0.10	1.00- 1.30

DISCUSSION

The management of a patient on aspirin therapy for cardiovascular diseases who have to undergo oral surgical procedures is a topic of concern to the oral surgeon as there is a potential risk for excessive bleeding after a surgical procedure, even if it is an uncomplicated extraction of teeth. This is attributed to the antiplatelet action of aspirin.[5]

Aspirin even at low doses of about 0.5-1mg /kg per day tends to inhibit platelet function for the entire lifespan of the platelet which is approximately 10 days.[6]

This is used to an advantage by a physician to prevent intravascular thrombosis without eliciting the possible side effects of high doses of aspirin.

The decision to continue or discontinue is like weighing the risk of any possible thromboembolic event against the risk of bleeding during the surgical procedure. Few factors such as patient's inheritent risk factors for bleeding, additional ongoing treatment which increases the bleeding risk, invasive potential of the surgical procedure and potential risk of thromboembolic event should be considered before stopping antiplatelet therapy.[7]

In the comparison of the net blood loss during extraction of teeth in a patient in whom extraction

was done without discontinuation of aspirin and after discontinuation of aspirin for a period of three days, it was observed that, the intra-operative blood loss was more in the initial appointment where aspirin was made to continue. Also the bleeding time and INR were slightly increased in the initial appointment as compared to second appointment where the patient was asked to discontinue aspirin intake. During both the appointments, no patient showed any postoperative bleeding episodes. The method of weighing surgical gauze for measuring the intra-operative blood loss during the appointments, though not very accurate is relatively easy and commonly used to calculate blood loss and definitely allows a better assessment of blood loss as compared to suction devices.[8]

Several authors have advocated the practice of discontinuation of aspirin prior to oral surgical procedure to avoid the risk of excessive bleeding intra-operatively and post operatively. While a few authors recommended the discontinuation for seven to ten days prior to the procedure, many other are of the opinion that discontinuation of aspirin three days prior to the procedure is justified.[1] In contrast to this practice it is proposed by a few authors that, the discontinuation of aspirin is unwarranted prior to minor oral surgical procedures, as the aspirin slightly increase bleeding in oral surgical procedure which can be controlled by local haemostatic measures.[9] In our study we observed well controlled bleeding when a patient was on aspirin and when the same patient discontinued aspirin. The results obtained in this study are in concordance with the opinion that the minor oral surgical procedures may be carried out without the discontinuation of aspirin.

It is reported that, extraction of periodontally involved teeth evokes increased bleeding both intra-operatively and post operatively as compared to extraction of carious teeth in a patient on aspirin therapy. This has been attributed to the hyperemic condition of the gingiva along with possible fragility of blood vessels leading to the bleeding.[10] The patient inherent factors such as older age, male gender, systemic conditions like diabetes mellitus and hypertension may be considered as risk factors for increased bleeding.[3] Also the number of teeth to be extracted in such patients in each appointment has a role in the loss of blood and has to be taken into consideration.

The hyper responsiveness of few individuals to aspirin therapy has been demonstrated by Ardekian et al; who observed prolonged bleeding episodes in six patients, 4 patients who continued asprin and 2 patients who discontinued aspirin after extraction of whom, 10% TAE and antifibrinolytic agents had to be used to bring about a control on the bleeding.[11] These patients were assumed to be hyper responsive to asprin as compared to other patients on aspirin therapy taking the same dosage. The identification of these hype responders to aspirin is essential for which a platelet function testing algorithm that combines preoperative risk factor assessment, template bleeding time and flow cytometry has been proposed.[12]

It is observed in this study that a low dose of aspirin (<325mg/day) need not be discontinued prior to routine oral surgical procedures as the risk of postoperative bleeding is minimal. Extensive surgical procedures may require the discontinuation of aspirin for a period of up to three days prior to the procedure.

CONCLUSION

This study demonstrated that extraction of teeth in patients on low dose of aspirin did not cause significant intra operative or post operative bleeding. Discontinuation of aspirin increases the risk of thromboembolic events which leads to high morbidity rate of such patients. The cardioprotective benefits of aspirin outweigh the risk of oral bleeding, which can be effectively controlled by local hemostatic measures. Hence it is advisable and safe to continue low dose aspirin therapy (100mg/day) when routine dental extractions are performed.

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