

A longitudinal study to evaluate the bleeding pattern of patients on low dose aspirin therapy following dental extraction

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ABSTRACT

Background and Aims: Antiplatelet drugs are often interrupted preceding invasive dental extraction because of concern of bleeding complications. The fear of uncontrolled bleeding often prompts medical and dental practitioners to stop aspirin intake for 7 to 10 days before any surgical procedure, which puts the patient at risk from adverse thrombotic events. The aim of the study conducted was to evaluate the bleeding pattern after routine dental extraction among patients on low dose long term aspirin therapy. **Methods:** A total of 104 subjects in the age group of 30-65 years, who continued to have aspirin intake during extraction were included in the study. Dental extraction was performed without stopping aspirin therapy under local anesthesia. The post-operative blood loss was quantified by weighing the gauze pre and post operatively and adding total volume of fluid in the suction jar. **Results:** Of these 104 patients treated, 87% of patients had mild bleeding (<20 ml) and 13% of patients had moderate bleeding (20-30 ml). The total study population showed a mean blood loss of 16.15 ± 3.5 ml. **Conclusion:** Within the limitations, our study concluded that the routine dental extraction in patients under low dose aspirin therapy did not cause clinically significant post extraction hemorrhage. Aspirin intake can be continued during routine dental extraction as post extraction bleeding encountered will be negligible.

Keywords: Aspirin, bleeding, blood loss, dental extraction, hemorrhage, post operative

Introduction

Several dental management protocols had been suggested for patients requiring dental extractions who are on long-term anti-platelet therapy. But still controversies remains whether to stop or continue anti-platelet therapy.^[1] The clinician must balance the risk of thromboembolism by reducing or stopping antiplatelet therapy against the risk of triggering excessive

post extraction bleeding if antiplatelet therapy is maintained at therapeutic levels during surgery. Aspirin is frequently used antiplatelet drugs which belongs to the non-steroidal anti-inflammatory drugs. Aspirin has a wide range of pharmacological actions as an analgesic, antiplatelet, antipyretic drug. Aspirin is being prophylactically used 33% for high-risk cardiac patients^[2,3] and 12-49% for persons with diabetes^[4,5] for secondary prevention of adverse thromboembolic events.^[6-8] The use of these antiplatelet drugs can make patients more susceptible to post extraction bleeding complications.^[9-11] This is of importance in the daily practice of dentists, especially when performing minor oral surgical procedures like routine dental extractions. Physicians most often advise patients

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Received: 26-02-2020

Revised: 19-03-2020

Accepted: 02-04-2020

Published: 08-04-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_312_20

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How to cite this article: Sunu VS, Roshni A, Ummer M, Aslam SA, Nair RB, Thomas T. A longitudinal study to evaluate the bleeding pattern of patients on low dose aspirin therapy following dental extraction. J Family Med Prim Care 2021;10:1399-403.

on antiplatelet therapy to discontinue the medication for 7-10 days^[12] or for at least 3 days^[13-15] before the dental extraction due to the concern of excessive bleeding from the surgical site. However, interruption of antiplatelet therapy results in adverse thromboembolic events due to progressive recovery of platelet function.^[16,17] Thromboembolic events are worse for patients than minor post extraction bleeding which can be controlled by local hemostatic methods.^[18] This study aims to estimate the volume of blood loss after routine dental extraction and to evaluate the bleeding pattern of patients on aspirin therapy. Also to establish tooth extraction protocol for patients on aspirin therapy in terms of continuing or altering the aspirin prior to dental extraction.

Method

Study design and population

104 subject were included in this study, all of them were recruited from department of OMFS, MES Dental College, Perithalmanna. Study period was from June 2018-August 2019. Patient who are on aspirin therapy (75 mg to 100 mg/day) for more than one year and between the age group 30-70 years requiring dental extraction were included. The study was approved by the ethical review board of MES Dental College IEC/MES/65/2017 (09/11/2017).

Inclusion and exclusion criteria

Following inclusion criteria were applied: Patients on aspirin therapy (75 to 100 mg) and whose bleeding time, clotting time PT, APTT and platelet count were in normal limits. Patient requiring dental extraction that could be performed on an outpatient basis. Patients who were willing to sign written informed consent were included. The exclusion criteria were as follows; Patients having an acute infection at the site of surgery. Patients with bleeding disorders, Patients on anticoagulants. Patients having hepatic and renal dysfunction. Patients on steroids, birth control pills, hormonal therapy and any drug that could interact with aspirin.

Surgical procedure

The patients were scheduled to undergo the procedure in the morning appointment. All patients were advised to do preoperative investigations bleeding time, clotting time PT, APTT, and platelet count. If bleeding time, clotting time PT, APTT and platelet count were within normal limits, extractions were performed without stopping aspirin therapy.

Tooth extractions were carried out following standard aseptic protocol using 2% lignocaine with adrenaline (1: 200000) as the local anesthetic agent. All extraction sockets were sutured with 3-0 silk and a compression pack was given. The patients were checked 30 minutes after the extraction for any bleeding. Post-operative medications such as antibiotics Amoxicillin 500 mg TID for 5 days and Paracetamol-based analgesics were prescribed. Follow-up was completed after 24, 72 hours, and at 1 week (when the sutures were removed).

Estimation of blood loss

Intraoperative blood loss was quantified by measuring the amount of blood in the suction device, subtracting saline used for irrigation and weighing gauze. Total blood loss = Blood in suction device + Blood in gauze

Statistical analysis

Data were coded and entered in MS Excel and analysis was done using SPSS trial version 22. Descriptive analysis was done.

Table 1: Mean value of different variable

Variables	n	Mean	Std. Deviation
Age	104	56.6731	7.78278
BT	104	2.7981	.82697
CT	104	8.6731	1.60969
PT	104	12.4904	.82433
APTT	104	32.6635	2.51832
Platelet Count	104	3.0096	.64183
No Of Tooth Extracted	104	2.0673	.82749
Volume Of Blood (Ml)	104	16.1538	3.58467

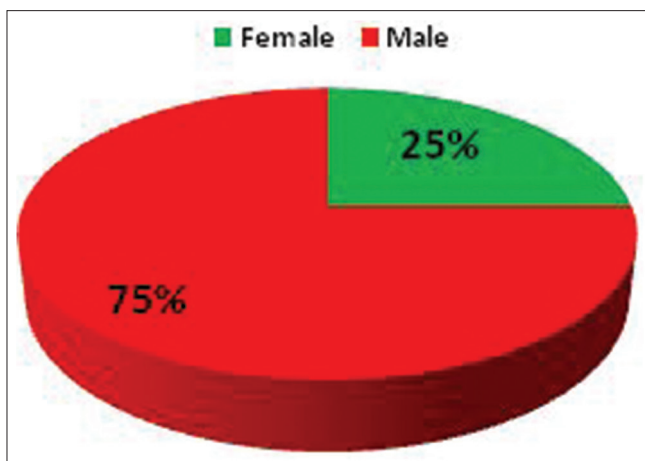


Figure 1: Percentage distribution of the sample according to sex

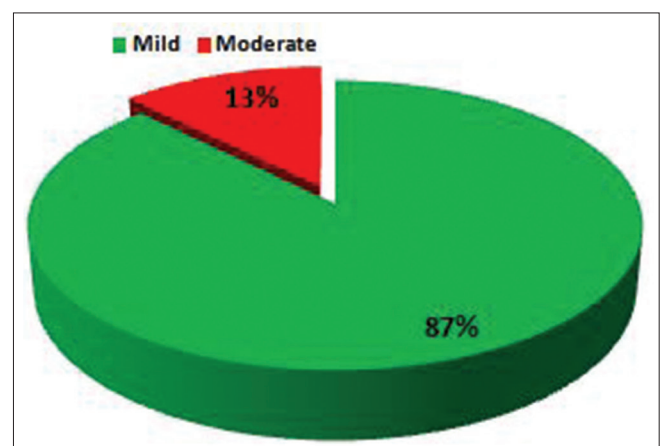


Figure 2: Percentage distribution of volume of blood loss

Table 2: Relationship between volume of blood (ml) and different variables

Variable 1	Variable 2	Coefficient of Correlation	Fisher's t	Significant value
Volume of blood (ML)	BT	-.050	-0.506	.614
	CT	-.084	-.849	.398
	PT	-0.022	-.227	.821
	APTT	.031	.308	.758
	Platelet count	-.160	-1.634	.105
	No. of tooth extracted	.101	1.027	.307

Table 3: Percentage distribution of volume of blood loss

Group	Frequency	Percentage
Mild	91	87.5
Moderate	13	12.5
Mean \pm SD		16 \pm 3.5

Proportions were expressed in percentage. Mean and standard deviation calculated for continuous variables. Blood loss were noted and expressed as proportions. Chi-square test used to determine the test of significance.

Results

The study sample comprised of a total of 104 subjects the mean age group was 56.6 ± 7.7 [Table 1]. The sample comprised of about 75% of males ($n = 78$) and 25% of females ($n = 26$) [Figure 1]. Among the sample ($n = 104$), 61% of patients had anterior tooth extraction, 39% of patients had posterior tooth extraction. The mean volume of blood loss was 16 ± 3.5 (ml). In this study <20 ml blood loss considered as mild bleeding, 20-30 as moderate bleeding and >30 as severe bleeding. 87% of patients had a mild bleeding and 13% of patients had moderate bleeding [Figure 2]. None of patients had an incidence of severe bleeding. The coefficient of correlation between the variables volume of blood (ml) and different variables for the total sample was presented in the Table 2. The coefficient of correlation values shows that there is a negative correlation exists between the volume of blood (ml) and variables BT, CT, PT, and platelet count since values are negative. The correlation coefficient between the volume of blood (ml) and variables APTT and the number of tooth extracted is. 031 and. 101 respectively, so exists a poor positive correlation. There is no statistically significant correlation exists between volume of blood with BT, CT, PT and APTT, the correlation between volume of blood with platelet count and volume of blood with no. of tooth extracted for the total sample. In our study, none of the patients had more than 30 ml of blood loss and the intraoperative bleeding encountered was controlled by local hemostatic measures. No bleeding required systemic therapy or admission to the hospital. No thromboembolism occurred. No medical emergencies occurred to patients during the period of the study.

Discussion

Nowadays, Aspirin is more commonly used as a precautionary medication to avoid adverse cardiac events like myocardial

infarction, stroke, etc., New guidelines by American college of cardiology and American heart association, 2019 endorse on use of aspirin for primary and secondary prevention of adverse cardiac events^[3] Aspirin as low as 40 mg to 160 mg/day has antiplatelet action and above 300 mg its anti-inflammatory action predominates.^[19,20] Aspirin doses greater than 320 mg/day is known for its anti-inflammatory and analgesic properties and antiplatelet efficacy is reduced due to blockage of prostacyclin production.^[21] Aspirin irreversibly inactivates COX-1 activity by binding to the active site of the cyclooxygenase enzyme and acetylating it. Acetylation prevents the activation of arachidonic acid and thereby inhibiting the production of the thromboxane A2 which is responsible for platelet aggregation.^[22] There is prolonged bleeding in aspirin therapy patient because of alteration in primary hemostasis.^[23] Studies conducted by V.A. Ferraris (1988),^[14] D. P. Taggart *et al.* (1990)^[23] on patients who continued having aspirin had increased bleeding tendency during cardiovascular surgery. Another case reported by Foulke (1976)^[24] showed a lethal hemorrhagic event occurred after oral prophylaxis in a patient who continued aspirin therapy during the procedure. Thomason *et al.* reported a case of immense bleeding after a periodontal surgery in a patient taking aspirin 150 mg/day. On the grounds of the studies, it has been suggested that the patient need to stop taking aspirin 7–10 days or at least 2-3 days^[10] before the dental extractions or any minor and major surgical procedures. Discontinuation of antiplatelet therapy can result in ramification thromboembolism which are profound and fatal to the patient than the minor bleeding.^[25,26] Stopping antiplatelet therapy puts cardiac patients at risk of adverse thromboembolic events. Many studies showed that risk of stopping aspirin therapy and making patients susceptible to life threatening thromboembolic episode overweighs the negligible risk of bleeding which can be controlled by local hemostatic measures.^[27-30] This study was done to estimate the amount of blood loss during routine dental extraction of patients on low dose long term aspirin therapy. A total of 104 patients who required single or multiple tooth extraction were enrolled to participate in this study. All routine dental extractions were performed without stopping the aspirin therapy. The study population included 26 female patients and 78 male patients. The mean age of the study population was 56.6 ± 7.7 years. In this study, all the patients underwent preoperative blood investigations like BT, CT, PT, APTT and platelet count. Of these 104 patients treated, 87% of patients had only mild bleeding (<20 ml) and 13% of patients had moderate bleeding (20-30 ml) [Table 3]. This bleeding was readily controlled pressure packing of the extraction socket. Results obtained in this study are consistent with a review of the literature by Wahl

2014.^[14] He reported that 98% of 774 patients who underwent dental extractions while on anticoagulant/antiplatelet patients had either no bleeding or insignificant bleeds that were managed by local measures. This study demonstrated that aspirin therapy need not be stopped before routine extractions. The bleeding complication if encountered during the procedure can be managed by local haemostatic measures.^[19] Continuing aspirin therapy does not produce a clinically significant bleeding complication. From the results of our study, it can be observed that routine dental extraction with no evidence of major bleeding complication can be safely carried out without stopping aspirin therapy, provided there should be sufficient local measures to control postoperative bleeding. Bleeding can be controlled with suturing and pressure pack for 30 min or with the use of local hemostatic agents such as tranexamic acid and epsilon-aminocaproic acid.^[31] During the surgical procedure, trauma should be minimized, cauterization must be performed, granulation tissue should be removed from the inflamed area. The preoperative cessation of antiplatelet therapy is still routinely practiced among dentist despite the documentation of adverse thrombotic events. The findings of our study may prove useful for both patient, dental surgeons and family physician when deciding whether to suspend or to sustain aspirin therapy before minor oral surgical procedures like routine dental extraction.

Conclusion

Within the limitations of the study we conclude that long term aspirin therapy does not significantly increase the risk of post-operative bleeding. Local styptics agents are sufficient to control the bleeding, if any encountered during the procedure. Routine dental extraction procedures in patients on low-dose aspirin therapy can be safely accomplished without ceasing aspirin therapy. The interruption of aspirin therapy should be carefully handled as adverse thromboembolic events are more fatal to the patients than the minor post-extraction bleeding.

Limitation of study

Intraoperative hemorrhage was estimated by a volumetric method and a gravimetric method. In addition to irrigating fluids and blood, the suction bottle contained constituents such as saliva. However, these were applied commonly to all the cases and bias of blood loss can thus be avoided.

Acknowledgement

Dr Rakesh, Dr Ajay Das, Dr Sooraj, Dr Tom Thomas who helped in successful completion of our study. We thank all the patients who were willing to participate in the study. Mr Praveen who helped us in data and the statistical analysis. The authors received no financial support and declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other

clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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