Clinical Evaluation of Role of Dual Antiplatelet Therapy on Bleeding after Dental Extraction

Abstract
Aims and Objectives: Altered platelet function and increased bleeding time (BT) can occur with antiplatelet therapy. This study was conducted to evaluate the need for stoppage of dual antiplatelet therapy in patients undergoing dental extractions. Materials and Methods: One hundred and fifty patients indicated for dental extraction were grouped as Group I: Consisted of 75 patients on dual antiplatelet therapy and Group II: Consisted of 75 patients who have discontinued antiplatelet therapy 1 week before dental extraction. BT of all the participants was recorded before extraction procedures. Under local anesthesia, single molar tooth indicated for simple extraction was done in both the groups. Suturing along with pressure pack was done after extraction. BT after extraction was statistically checked between the groups after 1 h and 24 h using Chi-square test with P < 0.05.
Results: Postoperatively, none of the patients in both the groups showed active bleeding 1 h and 24 h. No bleeding was seen in 73 patients in Group I and 78 patients in Group II after 24 h.
Conclusion: This study concluded that there is no significant difference in BT in both the groups. Antiplatelet monotherapy or even antiplatelet dual therapy needs no alteration or stopped before minor oral surgical procedures. Most of the postoperative bleeding can be easily controlled by local hemostatic measures.

Keywords: Bleeding, dual antiplatelet therapy, extraction, platelet function

Introduction
Hemostasis is the set of mechanisms that impede the loss of blood through fibrin formation (clotting). This process consists of three phases: (i) vascular phase or the phase of neurogenic vasoconstriction decreasing the escape of blood; (ii) platelet phase, in which platelet aggregation occurs concentrating a large number of factors necessary for the third phase; and (iii) plasma coagulation phase which brings about fibrin clotting. Platelets provide the initial hemostatic plug at the site of vascular injury, and they are involved in pathological processes and are an important contributor to arterial thrombosis, leading to myocardial infarction and ischemic stroke. Anticoagulants are a group of drugs used to treat many cardiovascular and cerebrovascular diseases for thromboembolic disorders by interfering in the platelet function. Bleeding time (BT) increases with use of aspirin by preventing platelet aggregation by irreversibly inhibiting the cyclooxygenase-1 (COX-1) enzyme. Aspirin affects clotting by inhibiting platelet aggregation by varied mechanisms. It irreversibly acetylates cyclooxygenase, thus inhibiting the production of thromboxane A2 causing decreased platelet aggregation by adenosine diphosphatase and collagen. It interferes with platelet function and lasts for the lifetime of the platelet, approximately 8–11 days. Per day, low doses of aspirin at 75 mg per can completely inhibit COX-1 enzyme with maximal antiplatelet effect. For long-term prevention of heart attacks low dose of 75–150 mg/day of aspirin and 160–325 mg/day of moderate dose for strokes and for immediate anticlotting benefit can be suggested.

Clopidogrel is a newer drug with antiplatelet effects derived mainly from thienopyridine that antagonizes platelet aggregation induced by adenosine diphosphate. On evaluating clopidogrel and aspirin, it was believed that clopidogrel was found to be superior to aspirin in the prevention of the combined risk of cerebrovascular accident, acute myocardial infarction, and cardiovascular mortality. However, when individual complications were analyzed separately, it was found that this superiority was
only maintained in the patient group with symptomatic peripheral arterial disease. As aspirin and clopidogrel have different mechanisms of action, it was thought that the combination of the two would boost the prevention of cardiovascular complications.\[^1\]

Despite the benefits of antiplatelet drugs, they are not without risk in that they can increase the risk of bleeding, particularly gastrointestinal bleeding, hemorrhagic stroke, and postoperative bleeding. Although various surgical procedures are performed in oral cavity, exodontia is the simplest and most common procedure done in dentistry. When dental surgeons treat patients on antiplatelet therapy, the foremost point of concern for them is the protocol for patients on such therapy. They are in a dilemma whether or not to suspend aspirin before extraction. Dentists typically advise patients to stop taking aspirin before tooth extraction for fear of excess bleeding. Available information regarding dental management of patients on antiplatelet therapy is limited; hence, the present study was conducted to evaluate the role of antiplatelet therapy on bleeding after dental extraction.

**Materials and Methods**

A total of 150 patients indicated for dental extraction were divided into two equal groups; Group I consisted of 73 patients on dual antiplatelet (aspirin and clopidogrel) therapy and Group II consisted of 78 patients who had discontinued antiplatelet therapy 1 week before the dental extraction. From physician, physical fitness of all patients was obtained. Informed consent of participating individuals was obtained. BT of all the participants was recorded before extraction procedure.

The exclusion criteria include bleeding and clotting disorders, blood pressure above 140/90 mmHg, grossly destructed or impacted tooth, mobile tooth (Grade II or III), history of uncontrolled bleeding episode, and liver diseases. BT of all the participants was recorded before extraction procedure.

In both the groups, single molar tooth indicated for simple extraction was done under local anesthesia. Later suturing with 3–0 silk and placement of pressure pack was done at extraction socket. All the procedures were done by single trained investigator. Type of bleeding (absence or presence of bleeding, oozing, and active bleeding) at socket was evaluated at 1 h and after 24 h postoperatively. Active bleeding was considered when the socket was bleeding sufficiently to fill the mouth with blood frequently. Local hemostatic measures were used to control any incidence of uncontrolled bleeding. Both the groups were compared statistically using SPSS statistical software package by IBM Corporation, version 21 (IBM Corp., Armonk, NY, USA), and with Chi-square test at significance of $P < 0.05$.

**Results**

Both Groups I and II were compared for BT after extraction and with respect to age and duration (months) of dual antiplatelet (aspirin and clopidogrel) therapy [Table 1]. None of the patients in both the groups showed active bleeding at 1 h and 24 h postoperatively. No bleeding was seen in 73 patients in Group I and 78 patients in Group II after 24 h. Oozing was seen three patients and one patient in Group I and Group II, respectively [Table 2]. There was no significant uncontrolled bleeding after dental extraction in both the groups [Tables 2 and 3].

**Discussion**

Treatment involving oral surgical procedures in patients on antiplatelet therapy must be decided according to the nature and severity of the disorder and extent of the proposed surgical procedure. The level of risk will depend on sufficient access to the surgical site to allow adequate local hemostasis management. Without adequate management, hemorrhage and hematoma can cause obstruction of the airway, placing the patient’s life in danger. The most important are to minimize trauma; to avoid flaps; to use surgical techniques that facilitate suturing; cauterization; all the measures necessary for good hemostasis management; and the removal of all granulation tissue from areas of chronic inflammation.\[^1\]

Hemostasis primarily depends on vascular and platelet-mediated event (platelet plug formation and

| Table 1: Intergroup comparison of age, duration of antiplatelet therapy, and bleeding time |
|-----------------|--------|------|------|--------|--------|
| Variables       | Groups | n    | Mean | SD     | SE     |
| Age (years)     | I      | 75   | 53.28| 12.124 | 1.124  |
|                 | II     | 75   | 54.12| 10.168 | 0.926  |
| Duration of dual antiplatelet therapy | I | 75 | 51.16 | 48.689 | 4.124 |
| Bleeding time in seconds | II | 75 | 48.62 | 45.265 | 4.372 |

$P = 0.238$. SD: Standard deviation; SE: Standard error; n=number

| Table 2: Bleeding status 24 h after dental extraction |
|-----------------|--------|------|------|--------|------|
| Group           | No bleeding | Oozing | Active bleeding | Total | P   |
| I               | 72     | 3     | 0    | 75     | 0.179 |
| II              | 74     | 1     | 0    | 75     | 0.05 |

$P<0.05$

| Table 3: Bleeding status 1 h after dental extraction |
|-----------------|--------|------|------|--------|------|
| Group           | No bleeding | Oozing | Active bleeding | Total | P   |
| I               | 68     | 7     | 0    | 75     | 0.578 |
| II              | 71     | 4     | 0    | 75     | 0.05 |

$P<0.05$
Platelets are involved in various thrombotic processes; antiplatelet drugs are used to prevent these processes in patients with cerebrovascular disorders.

This study was undertaken to evaluate antiplatelet therapy on bleeding after dental extraction. The study compared BT in patients on aspirin and clopidogrel therapy with those who discontinued it 1 week before extraction. In our study, both Groups I and II were compared for BT after extraction and with respect to age and duration (months) of antiplatelet therapy [Table 1]. None of the patients in both the groups showed active bleeding 1 h and 24 h postoperatively. There was no significant uncontrolled bleeding after dental extraction in both the groups [Tables 2 and 3]. The results were in concordance with results of Varghese et al. who studied BT in 190 patients after extraction of single molar.[5,7,4] Bajkin et al. concluded that extractions can be performed safely in patients taking single or dual antiplatelet drugs without interruption of treatment using only local hemostatic measures. Karasl et al. form their study confirmed that dental extraction can be done without a significant risk of bleeding and without altering the anticoagulant regimen in patients receiving warfarin who have an international normalized ratio from 1 to 4.[9,10] Studies conducted in the 1970s by Lemkin et al.[7] and Mc Gaul et al.[11] have documented that there is increased postoperative bleeding after dental extraction and recommended to discontinue aspirin. Many authors recommended stopping aspirin 7 days preoperatively.[12,13] Sonis et al. further stated that only the production of newer platelets will be able to overcome the inhibiting effect of aspirin.[13] The rationale for such recommendation is that, after 3 days of interruption of aspirin, sufficient number of newer platelets will be present in the circulation for effective hemostasis.[4] Sanchez-Palomino et al. from their study concluded that patients with dual antiplatelet therapy, dental extraction can be safely performed along with suturing and use of tranexamic acid.[1] Brennan et al. observed no differences in oral BT, cutaneous BT, secondary outcome measures, or compliance.[14] In contrast to our study, Lu et al. suggested cessation of aspirin 3–5 days before surgical procedures.[7] McGaul[11] and Daniel et al.[12] stated that continuing aspirin caused postoperative bleeding and advised discontinuation for 7–10 days before surgical procedures. This was recommended on the basis of surgical studies which showed a rise in both intra- and postoperative bleedings. Some authors advised that stopping of antiplatelets only for 3 days will be sufficient.[2] Sadeghi-Ghahrody et al. studied 64 patients after percutaneous insertion of coronary stents who were taking aspirin (acetylsalicylic acid) 80 mg and clopidogrel (Plavix®) 75 mg, and 50 healthy patients who were to have a conventional forceps extraction acted as controls. It was concluded that the use of aspirin and Plavix® simultaneously had no considerable effect on the risk of bleeding in patients having conventional forceps extraction of a single tooth.[13] Baser et al. form their study found that awareness about gingival health and bleeding is more among dental students.[16] From the present study, it can be observed that dental extractions can be done safely in patients on antiplatelet therapy without altering or modifying its dose to avoid complications of thromboembolism and provided that there should be sufficient local measures to control postoperative bleeding. Infiltration or intraligamentary injection should be administered wherever practical. Avoidance of regional nerve blocks should be practiced wherever possible. However, if there is no alternative, the local anesthetic should be administered cautiously using an aspirating syringe.[17] The procedure should be as atraumatic as possible and any bleeding should be managed using local measures. Absorbable hemostatic dressing should be used in sockets; these include oxidized cellulose, collagen sponge, or absorbable gelatin sponge. Pressure should be applied to the socket using a gauze pad that the patient bites down on for 15–30 min.[17] A limitation of the study includes lesser sample size. Further research is required on larger samples to evaluate the role of different antiplatelet drug therapy on bleeding during different oral surgical procedures.

**Conclusion**

The present study showed no significant difference in BT in both the groups. Hence, long-standing dogma concerning the exaggerated risk for bleeding during and after dental procedures results in stopping antiplatelet medications before a procedure causes unnecessary deferral of dental care.

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**Conflicts of interest**

There are no conflicts of interest.

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