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Risk of bleeding in patients on single and dual antiplatelet therapy undergoing dental extractions

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***Abstract*---**We assessed the impact of single and dual antiplatelet therapy on postoperative bleeding in dental extraction patients. The study involved 160 patients on antiplatelet medication and a control group of 105 healthy subjects undergoing extractions. Bleeding was considered an "event" if it persisted over 12 hours or met other specific criteria. A total of 115 teeth were extracted from control, 48 teeth were extracted from the dual drug group and 122 from the single drug group, with no significant difference in postoperative bleeding incidence (x2 = 4.3, p = 0.11). Dental extractions for patients on single

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or dual antiplatelet therapy can be performed safely using local haemostatic measures without treatment interruption.

***Keywords*---**risk bleeding patients, dual antiplatelet therapy, dental extractions.

Introduction

The most common indications for long-term use of antiplatelet agents are ischemic heart disease, previous myocardial infarction, coronary artery bypass surgery and stent placement, non-hemorrhagic stroke, transient ischemic attacks, and peripheral arterial disease. Antiplatelet medications are widely used in the prevention and management of arterial thrombosis[1,2]. The most popular antiplatelet medications include low doses of aspirin, clopidogrel, ticlopidine, and dipyridamole. Lifelong activity of platelets is impacted by aspirin (7–10 days). Thienopyridines, such as clopidogrel, ticlopidine, and prasugrel, block adenosine-diphosphate receptors also effective during the lifetime of a platelet[3,4].

Patients who are on single or double antiplatelet therapy (APT) are at an increased risk of bleeding during dental extractions. The risk of bleeding depends on several factors, including the type of APT, the dosage, the duration of therapy, and the patient's overall health[5]. Single antiplatelet therapy with agents such as aspirin or clopidogrel has been associated with a low risk of bleeding during dental procedures, and discontinuation of therapy is generally not necessary[6]. However, some studies have reported an increased risk of bleeding in patients who continue to take aspirin or clopidogrel during dental extractions[4,5].

Double antiplatelet therapy with aspirin and clopidogrel, or other combinations of APT, is associated with a higher risk of bleeding during dental procedures. In such cases, the decision to continue or discontinue APT should be made on a case-by-case basis, considering the patient's undividable risk of thrombotic events[7]. For patients who require dental extractions while on APT, several management strategies can be employed to reduce the risk of bleeding. These may include the use of local hemostatic agents, such as oxidized regenerated cellulose or tranexamic acid mouthwash, or the administration of systemic hemostatic agents, such as epsilon-aminocaproic acid or desmopressin[8,9].

The aim of current was to assess post-tooth extraction bleeding in patients consuming single and double antiplatelet drugs.

Methodology

It was a clinical study, data was collected prospectively from 1st January 2021 to 31 June 2022. A written consent was signed from each selected patient included in the study; which was approved from ethical committee of the parent institute.

Table 1. Number of patients selected to participate in the study (n=280).

S.No	Groups	Participants
1	Healthy patients	110
2	Double-Med patients (aspirin + clopidogrel or aspirin + ticlopidine or aspirin + prasugrel)	48
3	Single-Med patients (aspirin or clopidogrel, or ticlopidine)	122
Total		280

According to hong et al[10] After initial scrutiny only, patients who needs simple extraction under local anesthesia of a single tooth with no need for mucoperiosteal flap were included. Patients suffering any liver disease, and patients consuming alcohol, anticoagulant drugs and/or non-steroidal anti-inflammatory agents that carry the possibility to interact with aspirin. Additionally, patients who suffered a serious hemorrhage after dental extractions even without starting the antiplatelet drug therapy, and ones who discontinued antiplatelet drug therapy no matter what was their intention, were excluded from the study. Number of patients along with their indication for antiplatelet drug therapy are listed in table 2.

Table 2. Indications for antiplatelet drug therapy.

Purpose of antiplatelet drug therapy	Patients consuming double antiplatelets (n=48)	Patients consuming double antiplatelets (n=122)
Coronary artery stents	29	16
Post myocardial infarction	8	22
Post coronary artery bypass	4	26
Angina pectoris	3	31
Ischaemic heart disease and thrombophlebitis	2	2
Ischaemic heart disease and cerebrovascular disease	0	3
Ischaemic cerebrovascular disease	0	8
Post peripheral vascular surgery	0	3
Thrombophlebitis	0	6
Valvar heart disease	0	1
Thrombophilia	0	1
Primary prevention	2	3

Solution of 2% lignocaine with 1/80000 adrenaline was used as local anesthetic for each patient and extraction was done by the same surgeon in department of oral and maxillofacial surgery, Rahman College of Dentistry, Peshawar, Pakistan. Extractions from each patient were done by the same House Oral surgeon. Extraction socket was closed without suturing using (only pressure packs placed). The socket was then packed with sterile gauze and patient was asked to bite firmly for 1 hour.

Patients were advised to take Tab. Paracetamol 1gm QID to relieve any post-extraction pain and to follow post-operative instructions. Each participant was examined after 20 mint. 30 mint, 45 mint 1 hr, 2 hr, 24 hrs 2 days 5 days. Patients who were facing difficulty in commuting were contacted by telephone call and they were instructed to call their House oral surgeon if there is any event of bleeding. Protocoals were set in dental emergency department for patients if they face heavy bleeding according to Lockhart et al[11].

Statistical analysis

The x2 test was used to evaluate significance of differences in postoperative bleeding amongst various groups. Analysis of variance was used to assess significance of differences between these variables. P- value of less than 0.05 was considered significant.

Results

Initially 315 patients were enrolled for the study fulfilling the inclusion criteria. Thirty-five patients were excluded out of which ten patients discontinued their anti-platelet drugs, seventeen patients needed a very complex and surgical extraction, and eight patient left for whatever the reason was. Data were analyzed for 280 patients their details are enlisted in Table no 2. Aspirin noticed to be the most commonly prescribed antiplatelet agent in both groups. Table 2.

No patients developed heavy post-operative bleeding. No statistically significant difference was observed in postoperative bleeding between patients of healthy group and those on single and double anti-platelet drug therapy ($x2 = 5.23$, $p = 0.12$). However, the wound required suturing to achieve effective initial hemostasis in 1/51 (1.96%) occasions of tooth extractions in the double group, in 2/128 (1.6%) occasions in the single group, and in none of the control patients ($x2 = 9.21$, $p = 0.008$).

Table 3: variables of the three groups of selected patients.

Characteristics	Double antiplatelets (n=48)	Single antiplatelets (n= 122)	Control (n=115)
Mean (SD) age (years)	61.1 (10.2)	63.4 (10.8)	61.2 (11.3)
No. of extractions (occasions)	51	128	127
Purposes for tooth extraction			
• Periodontal	32	56	59
• Caries	19	72	68
Suturing for local haemostasis	1 (1.96%)	None	None
Postoperative bleeding	None	None	None

Discussion

Antiplatelet medications are widely used in the prevention and treatment of numerous ischemic diseases of the cardiovascular and cerebral systems. The effectiveness of antiplatelet medications in providing protective benefits to people with acute myocardial infarction or ischemic stroke, stable and unstable angina, prior incidences of myocardial infarction, stroke, or cerebral ischemia, peripheral arterial disease, and atrial fibrillation has been confirmed by a meta-analysis conducted by the Antithrombotic Trialists' Collaboration[12]. The aforementioned studies have confirmed the antiplatelet medications' significant effectiveness in preventing occlusive vascular events secondary to primary prevention. Nonetheless, given the increased vulnerability to bleeding, the use of these medicines in the context of primary prophylaxis should be carefully considered. It is important to remember that each antiplatelet drug has a unique mode of action that has a different effect on platelet aggregation[13]. Combinatorial utilization of dual antiplatelet agents is feasible and occasionally implemented owing to the compounded efficacy of diverse potential pathways involved. One instance is the recommendation of utilizing clopidogrel alongside low-dose aspirin in individuals with stents (angioplasty), as outlined in literature sources. This combination has been observed to be significantly utilized in recent times[14].

The perioperative care of patients on antiplatelet medicines entails balancing the risk of bleeding if the drugs are prolonged with the risk of thrombosis if they are not. The risk of stent thrombosis after premature withdrawal of dual antiplatelet therapy is well understood, and it is the leading cause of late thrombosis with catastrophic consequences: reported mortality from suspected or verified thrombosis ranges from 20% to 45%. The American Academy of Chest Physicians recommends maintaining antiplatelet medications perioperatively in patients who require surgery within 6 weeks of a metal stent installation or within 6 months of a drug-eluting stent placement.

Recent investigations have found that small oral operations can be performed safely (without the danger of bleeding) in patients taking low dosages of aspirin[15]. These findings support the continued use of low-dose aspirin during dental extractions. However, because the number of patients included in these studies was modest, the authors indicated that more study is needed. Thus far, there has been insufficient evidence about the risk of bleeding during oral operations in patients using thienopyridine alone or in combination with aspirin[16]. Another recent study found that patients using the combined oral anticoagulant-aspirin regimen who needed dental extraction did not need to stop taking either anticoagulant or aspirin. Some recent trials included individuals on dual antiplatelet therapy who needed oral surgery. The authors among these research confirmed that continuing dual antiplatelet medications is rather safe, although they emphasized the need for additional study due to the limited sample sizes[17].

Only 1 in 43 patients (59 extractions) suffered mild postoperative bleeding when using dual antiplatelet medications after extractions of three upper teeth. There were no postoperative haemorrhages among the 117 patients (128 extractions) in the specific drug group (containing 20 patients on clopidogrel and 13 on ticlopidine). Suturing of the wound, on the other hand, was required in 4 and 2

patients using dual and singular antiplatelet medicines, respectively, as opposed to healthy people.

In none of our patients did we measure bleeding time. Individuals using antiplatelet medicines may have longer bleeding time, but somehow the test is not efficient enough as to anticipate the likelihood of bleeding following dental surgery. Moreover, according to several recent publications on tooth extractions in patients using antiplatelet medicines, the bleeding duration was almost invariably within the usual range[18–20]. The platelet aggregation testing is more precise, but it is rarely used in clinical settings. Only one small population study has been conducted where the platelet aggregation examination was employed prior to tooth extractions, implying that this along with additional platelet function assessments may be essential for future research[21].

No standards have been set yet to measure the amount of bleeding in patient on anti-thrombotic drugs. However different researcher has used different approaches for the cited purpose, which made it challenging to compare our study precisely. In current study Lockhart et. al, was used which was more convenient[11].
Limitations of our study count limited sample size and simple extraction, as bleeding duration in these patients should be evaluated on a larger scale population and in patients requiring surgeries other than just a simple extraction.

Conflict of interest statement

There is no conflict of interest.

Ethical approval/confirmation of patients' permission

The study was approved by the local Ethics Committee. All patients provided written informed consent to take part in the study.

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