

The effect of single antiplatelet therapy on bleeding time during minor oral surgical procedure: a prospective study

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ABSTRACT

Background: antiplatelet agents have been widely used for the prevention and management of blood vessel thrombosis and heart stroke by preventing clot formation and platelet aggregation. On the other hand, antiplatelet drugs have also been related to an increase in bleeding time and risk of postoperative hemorrhage, so some dentists and surgeons still recommend the patient to stop the therapy for at least 3-7 days before any oral surgical procedures. **Aim:** the aim of this study was to evaluate the bleeding time with minor dental surgery in the patient on single antiplatelet drugs. **Material and Method:** Twenty patients who were planned for minor dental surgery (single dental extraction) were divided into two groups. In group A, patients on single antiplatelet therapy were included and in group B, patients who interrupted the drug before 2-3 days of procedures were included. The bleeding time of all patients was recorded before dental surgery. The minor oral surgery involved simple extraction of a single tooth under local anesthesia. The extraction socket was sutured with 0.3 silk and pressure pack gauze was given for at least 1h after extraction. Bleeding time after 1h and 24h was compared between two groups. A chi-square test was used to compare variables. **Results:** none of the patients showed active bleeding in the post-operative period. The results for postsurgical bleeding were statistically insignificant with $P=0.05$. **Conclusion:** minor dental surgical procedures especially single tooth extraction can be done without stopping of single antiplatelet therapy.

تأثير العلاج المضاد للصفائح الفردية على وقت النزيف أثناء إجراء جراحة الفم البسيطة: دراسة مستقبلية

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الكلمات المفتاحية:

الأدوية المضادة للصفائح
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تشكيل الجلطة

الملخص

معلومات أساسية: تم استخدام العوامل المضادة للصفائح على نطاق واسع للوقاية من تجلط الأوعية الدموية والسكتة القلبية وإدارتها عن طريق منع تراكم الصفائح الدموية وتشكيل الجلطة. من ناحية أخرى، ارتبطت الأدوية المضادة للصفائح أيضاً بزيادة وقت النزيف وخطر حدوث نزيف ما بعد الجراحة، لذلك لا يزال بعض أطباء الأسنان والجراحين يوصون المريض بوقف العلاج لمدة 3-7 أيام على الأقل قبل أي إجراءات جراحية عن طريق الفم. الهدف من هذه الدراسة هو تقييم النزيف من خلال جراحة الفم الصغرى لدى المريض باستخدام الأدوية المضادة للصفائح الفردية. المادة والطريقة: تم تقسيم عشرين مريضاً ممن تم التخطيط لإجراء جراحة الفم البسيطة مثل قلع سن واحد إلى مجموعتين. في المجموعة A، تم تضمين المرضى الذين عولجوا بمضاد للصفائح الفردية وفي المجموعة B، تم تضمين المرضى الذين توقفوا عن تناول الدواء قبل 32- أيام من الإجراءات. تم تسجيل وقت النزف لجميع المرضى قبل جراحة الأسنان. تضمنت جراحة الفم البسيطة قلعاً بسيطاً لسن واحد تحت التخدير الموضعي. تم خياطة تجويف الاستخراج بـ 0.3 حرير وتم إعطاء ضمادة ضغطت لمدة ساعة واحدة على الأقل بعد الاستخراج. تمت مقارنة وقت النزف بعد ساعة و 24 ساعة بين

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مجموعتين. تم استخدام اختبار في مربع لمقارنة المتغيرات. النتائج: لم يظهر أي من المرضى نزيف نشط في فترة ما بعد الجراحة. كانت نتائج النزيف التالي للجراحة غير ذات دلالة إحصائية حيث كانت $P = 0.05$. الخلاصة: يمكن إجراء العمليات الجراحية الفموية البسيطة مثل قلع الأسنان الواحدة دون توقف العلاج المضاد للصفيحات.

Introduction

It is common for physicians and dentists or surgeons to make decision for their patients who are on antiplatelet drug to either routine stop or alter their medications for 7 to 10 days, or for at least 3 days before surgical operation due to fear of prolonged and uncontrolled bleeding (1). However, the interruption of antiplatelet therapy is related to progressive therapy of platelet aggregation and the increased high-risk of rebound of thrombotic events, which can be life-threatening (2).

In case of blood vessel injury, the hemostatic mechanism is the main reason for stopping extravasation (3). The hemostatic mechanisms are characterized by two consecutive stages: primary and secondary stages. The primary hemostatic mechanism stage is the formation of a weak platelet plug which is carried out in four phases: vasoconstriction, platelet adhesion, platelet activation, and final stage platelet aggregation (4). The secondary hemostatic mechanism stage is mediated by a cascade of multiple an enzymatic reaction that ultimately results in the conversion of fibrinogen to fibrin clot (3).

The most common antiplatelet therapists are acetylsalicylic acid (aspirin), clopidogrel (5). The anti-thrombotic action of aspirin is mediated by irreversible inhibition of cyclooxygenase enzyme activity in platelet. So, Phospholipase A2 acts on the cell membrane to reduce arachidonic acid to produce thromboxane A2. The thromboxane A2 is a strong platelet stimulant that causes degranulation of platelet and platelet aggregation, which increasing bleeding time (6). However, the antiplatelet effect of clopidogrel is higher than that of aspirin in the secondary prevention of myocardial infarction and peripheral arterial insufficiency (7). Furthermore, clopidogrel is very expensive, so it is mainly used selectively in patients resistant to treatment with acetylsalicylic acid (aspirin). The effect of clopidogrel is irreversible action and lasts for the life of the platelet at least (7 to 10) days (7).

For patients using single antiplatelet therapy (SAPT), it seems to be advisable not to stop the antiplatelet therapy before minor dental surgery because the risk of non-fatal bleeding does not outweigh the high-risk of fatal thromboembolic events (8). In opposite, the perioperative treatment of dual antiplatelet therapy (DAPT) still a clinical challenge due to the bleeding risk may be higher than with (ASPT) (9).

Scottish Dental Clinical Effectiveness Programme, for an instant, recommends that patients be treated without interrupting their antiplatelet medication (10). However, most western documents have reported that single antiplatelet therapy should not be interrupted before minor dental surgical procedures, while patients on dual antiplatelet drug in the most cases may need to be referred to a hospital basal dental clinic (11-12).

MATERIALS AND METHODS

The study was conducted in the Department of Maxillofacial and Oral Surgery, Dental College, Sebha University, Libya, from March to December 2021. Cases visiting the outpatient dental clinic for minor dental surgery especially single dental extraction and who were on single clopidogrel or low-dose aspirin were selected for the study. Medical compromised patients with a history of blood disorders, liver diseases, uncontrolled bleeds, hypertensive, patients with impacted and mobile teeth and taking dual antiplatelet drug were excluded from the study. Bleeding time before and after 1-24h of procedure of including patients was recorded. An informed consent

was obtained from the patients. The study was approved by the departmental ethical committee (1/2021). Selected patients were divided into two groups. In Group A, ten patients were studied; without stoppage of aspirin or clopidogrel prior of the procedure was recommended, and in Group B, the other ten patients dedicated were in whom the drugs were interrupted 3 days before the minor dental surgery. The dental extraction of third molar teeth (not impacted) was done by a single surgeon. The investigator was blind to the groups being studied. Suturing with 0.3 absorbable silk was done, then followed by tight pressure on the sterile gauze pack placement in the extraction dental socket for at least 1 h, and routine appropriate instructions were given to the patients. Patients were allowed to leave 1 h after extraction. Bleeding was checked 1 h and 24 h postoperatively. All the patients were requested to contact immediately if any bleeding or other complications occurred. Postoperative patients were evaluated for the presence or absence of minor oral bleeding and active oral bleeding. Active bleeding was considered when the dental socket wound was bleeding sufficiently to fill the whole mouth with blood frequently. Local hemostatic measures that including a pressure packs gauze, absorbable gelatin sponge, and suturing were applied to control any incidence of uncontrolled bleeding postoperatively. The data were recorded into a master sheet, and SPSS software (SPSS 15; SPSS Inc., Chicago, IL, USA) was applied to do the computational analysis. A Chi-square test was applied to compare the results, and $P < 0.05$ was considered statistically significant.

Results

The studied groups were compared concerning age and duration of the therapy [Table 1]. The mean bleeding time was recorded before the dental surgery. We did not notice any significant active bleeding (AB) in any group at a 1-h postoperatively, except for minor bleeding (MB) in two patients in Group A and one patient in Group B [Table 2]. At a 24-h time, no significant active bleeding (AB) was reported in either of the two groups except for minor bleeding (MB) in three of the Group A patients and two of the Group B patients [Table 3].

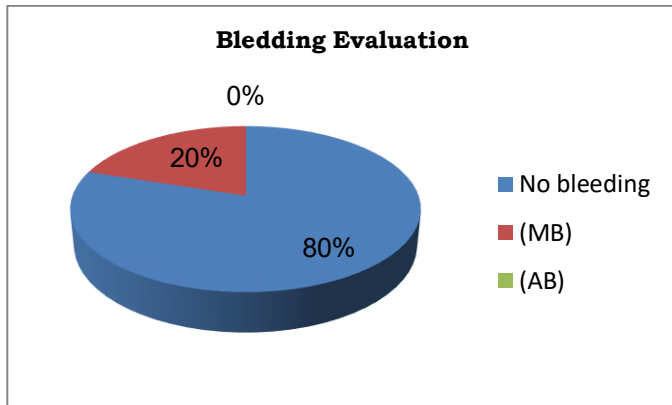
Table 1: Comparison of various variables in the two groups and preoperative bleeding time

Variable	Group of patients	Number of patients	Means
Age (year)	A	10	54.15
	B	10	52.11
Pre-operative bleeding time (s)	A	10	76.19
	B	10	76.10
Duration of therapy (months)	A	10	55.73
	B	10	53.34

Table 2: Postoperative bleeding after 1 hour

Group	No. patients	No bleeding	(MB)	(AB)
A	10	8	2	0
B	10	9	1	0

$P = (0.05)$

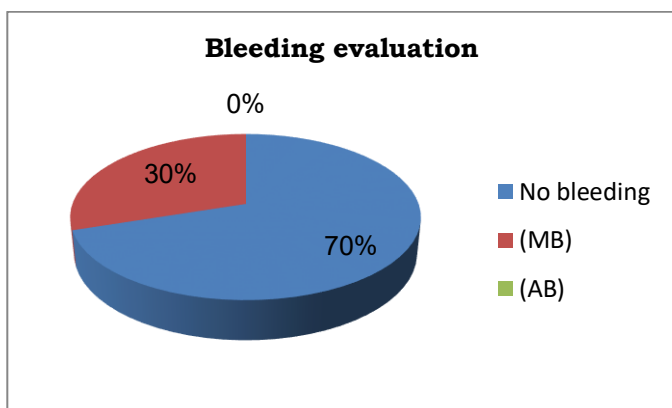


Graph 1: postoperative bleeding following 1 hour

Table 3: Postoperative bleeding at 24 hour

Group	No. patients	No bleeding	(MB)	(AB)
A	10	7	3	0
B	10	8	2	0

P= (0.05)



Graph 2: postoperative bleeding following 24 hour

Discussion

Currently, antiplatelet therapy as aspirin and clopidogrel are used widely to prevent complications of infarction in cardiovascular or cerebrovascular diseases. Dentists and surgeons are always in debate whether to interrupt or continue the antiplatelet medication. In dentistry, bleeding complication from dental extractions and gingival surgery has been documented in earlier case reports of patients on aspirin (13, 14).

The post-surgical bleeding is the main risk to be a concern in any patient taking antiplatelet therapy to prevent intravascular thrombosis and these patients are often managed by stopping the antiplatelet drug for a brief period of time before surgery (15). Furthermore, the high-risk of a more severe thromboembolic event is evident from literature as interrupting antiplatelet drug is connected with recovery of platelet function because of platelet rebound phenomenon on sudden stoppage of aspirin drug, which leading to create a prothrombotic state is a proven fact in the many of studies (16, 17, 18).

Few studies that recommended stopping aspirin drug before the dental surgical procedure due to increased risk of bleeding (19, 20, 21). Interestingly, none of these studies are from dental literature review.

Krishnan et al, reported that patients continuing single antiplatelet therapy as aspirin drug can undergo routine dental extraction without increased risk of excessive or uncontrolled bleeding time. However, only considering the positive reports in favor of continuing aspirin and ignoring the high-risk associated with aspirin use is not a sound scientific principle. Therefore, a discussion regarding negative

reports indicating a high-risk of bleeding with aspirin use is essential (22).

Schrodi et al, reported that excessive bleeding on probing in patients using aspirin drug (23). Similarly, the other study reported that uncontrolled prolonged bleeding complications after dental extractions in the patient using aspirin were slightly higher (24). Furthermore, Scher et al found continuous diffuse bleeding after dental surgical operation (25). More ever, the dental literature regarding high-risk of bleeding during minor oral surgery was isolated case studies or small case series; whereas literature regarding the safety of the dental extraction in patients still using aspirin was based on studies with adequated sample size (23).

A similar study was done to evaluate interrupting versus continuing low dose aspirin before dental extraction reported by Ardekian et al. Thirty-nine patients using aspirin 100mg daily were included. Nineteen patients continued taking aspirin as usual, while 20 patients stopped taking aspirin 7 days before the dental extraction. The mean bleeding time was longer in patients who still taking aspirin compared to those who interrupted (3.1 min vs 1.8 min, p=0.004). Although the difference was statically significant, none of the patients who still using aspirin had a bleeding time more than the normal range in this study (2-10min). Furthermore, it was noted that no patients experience uncontrolled bleeding immediately after the dental procedure or in the following week (26).

There are few published literatures that reported association between risk of postoperative bleeding with patient taking clopidogrel and dipyridamole drug (27). However, recent studies in dentistry concluded that patients on clopidogrel should not have the dose altered or interrupted before the dental surgery (28). On other hand, if patients take both aspirin and clopidogrel, they should be referred to a dental hospital or hospital-based oral/maxillofacial surgeon (30).

The American Heart Association, American College of Surgeons, American College of Cardiology, American Dental Association, Society for Cardiovascular Angiography and Interventions have advised that single or dual antiplatelet drug should not be stopped for dental surgery, conducting, "Given the relative ease with which the incidence and severity of oral bleeding can be managed with local measures during oral surgery such as absorbable gelatin sponge and sutures and the unlikely occurrence of excessive bleeding once an initial clot has formed, there is little or no indication to stop antiplatelet drugs for dental procedures" (29). The American College of Chest Physicians also recommends continuing aspirin for dental surgery (30).

Nooh et al studied one hundred and eighty-nine patients were divided into four groups. Group 1A cases, who received ASA, underwent simple extraction. Group 1B cases, who received ASA, underwent surgical extraction. Group 2A patients, who did not receive ASA, underwent simple extraction which considered as control group. Group 2B patients, who did not receive ASA, underwent surgical extraction which also considered as control group. The study concluded the same our conclusion that patients who received 81 mg ASA (single low dose of aspirin) daily could undergo dental extraction without bleeding risks (31).

The results are in accordance with the current studies (32, 33, 34, 35), and they support the principle that minor oral surgical procedures can be done safely and without any complication in a patient with a single (low-dose) antiplatelet drug with aspirin or clopidogrel.

Our study demonstrated that minor oral surgery especially simple dental extraction did not result in uncontrolled intraoperative or postoperative bleeding in patients taking single low dose aspirin or clopidogrel drug on a long term basis. No emergent steps were needed to stop the bleeding in these patients and in most cases suturing was the only hemostatic measure applied. Furthermore, the bleeding time records of all patients were within normal range,

regardless of whether patients continued or discontinued aspirin drug and no complications in patients after dental surgery were observed.

Conclusion

In light of our results in this preliminary, limited size study, we concluded that there is no need to expose patients to the risk of the thromboembolism, cerebrovascular accident, and myocardial infarction before planned single dental extraction in such cases can be controlled by local hemostatic measures as sterile pack pressure gauze, gelatin sponge, and suturing. Consequently, they should continue to take their daily single low dose of aspirin or clopidogrel during the preoperative period.

Limitation

Some limitations of this prospective study must be taken in your consideration. First, most of the selected cases excluded patients with systemic congenital diseases, bleeding disorder, and those taking any medication (other than antiplatelet drug) affecting haemostasis. Second, the method of extraction (simple or surgical) and the number of extracted teeth are influence the high-risk of bleeding. Last, all surgical procedures were done by same surgeon and according to same protocol with all patients of different ages and the reason for taking a drug, so the selected sample size is few compared to other studies, but to focus on a specific group only (single dental extraction with single low-dose antiplatelet therapy).

Abbreviations and Acronyms

SAPT= single antiplatelet therapy

DAPT= dual antiplatelet therapy

AB= active bleeding

MB= minor bleeding

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There is no funding

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