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ORIGINAL ARTICLE

# The effect of aspirin on bleeding after extraction of teeth

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**Abstract** Acetylsalicylic acid (ASA) generically known as aspirin is used clinically as an analgesic, antipyretic, anti-inflammatory and as a medication to prevent platelet aggregation. Many studies have investigated bleeding associated with ASA.

**Objective:** The aim of this study was to determine if ASA was associated with bleeding after dental extraction.

**Patients and methods:** One hundred and eighty-nine subjects were divided into four groups. Group 1A subjects who received ASA, underwent simple extraction. Group 1B subjects who received ASA, underwent surgical extraction. Group 2A subjects who did not receive ASA, underwent simple extraction which served as control group. Group 2B subjects who did not receive ASA, underwent surgical extraction which also served as control group.

**Results:** The results showed that Group 1B was the only group which showed bleeding after 24 h. All groups had similar results after 48 h and 5 days post-operatively.

**Conclusion:** The study concluded that subjects who received 81 mg ASA daily could undergo dental extraction without bleeding risks.

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## 1. Introduction

Acetylsalicylic acid (ASA) generically known as aspirin is used clinically as an analgesic, antipyretic, anti-inflammatory agents and as a medication to prevent platelet aggregation. It is indicated for long term use in patients susceptible to the formation

of emboli, such as patients who have suffered from stroke, angina or myocardial infarctions (Anonymous, 2002).

In 1899, a French chemist, Charles Frederic Gerhardt was the first to isolate and prepare aspirin. The name aspirin was derived from A “Acetyl” and Spirin from “Spirsäure”, an old German name for salicylic acid.

ASA suppresses the production of prostaglandin (PG) and thromboxane (Thx) by the inactivation of cyclooxygenase enzyme. In addition, it blocks Thx A<sub>2</sub> leading to a defect in platelet aggregation. The function in platelets leads to the reduction of the incidence of embolism (Brennan et al., 2007). The Antiplatelets Trialists’ Collaboration in a meta analysis of 135,000 patients in around 300 studies has shown the prophylactic effect of ASA on patients who have suffered from myocardial infarction, angina or stroke, and that the vascular events were reduced by 20–25% and mortality

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reduced by 12% (Antiplatelets Trialists' Collaboration, 1994).

The effect of aspirin on platelets is measured by bleeding time. Many studies have shown that a low dose of ASA has an effect on bleeding time (Yokoyama et al., 2008; Marshall et al., 1997). However, others have shown that there were no effects on bleeding after extraction of teeth (Krishnan et al., 2008), investigated dental extraction in three groups, Group 1 patients stopped the use of aspirin before dental extraction, Group 2 continued aspirin during the dental extraction and Group 3 did not use aspirin. They found that no significant differences in bleeding time were evident among all three groups and they recommended that patients should continue taking ASA during dental extraction (Krishnan et al., 2008). Discontinuing the use of ASA before dental extraction was also investigated by Aframian et al. (2007) and they recommended that the use of ASA did not have to be discontinued before dental extraction.

The aim of this study was to determine if ASA was associated with bleeding after tooth extraction.

## 2. Patients and methods

A total of 189 subjects (54 males and 135 females) were included in this study. The subjects are divided into two groups: Group 1 comprised 102 subjects (29 males and 73 females) who were using ASA 81 mg once a day for the previous 6 months. Group 2 was the control group and it comprised 87 subjects (25 males and 62 females) who did not use ASA. The age of the subjects ranged from 45 to 65 years (mean 58 years).

The exclusion criteria included subjects with anaemia, liver disease or any medical condition which might affect the coagulation process and subjects with a history of bleeding episodes or epistaxis. In addition, subjects suffering from any psychiatric diseases were not included in the study. Subjects with a systolic blood pressure above 150 mm/gh or a diastolic blood pressure above 98 mm/gh were excluded.

The extractions were divided in two categories. Category A subjects who underwent simple extraction and Category B subjects who underwent surgical extraction. All extracted teeth in this study were maxillary or mandibular molars.

Group 1A: Subjects who received ASA and underwent simple extraction (17 males and 36 females).

Group 1B: Subject who received ASA and underwent surgical extraction (12 males and 37 females).

Group 2A: Control subjects who underwent simple extraction (11 males and 30 females).

Group 2B: Control subjects who underwent surgical extraction (14 males and 32 females).

## 3. Surgical procedures

The blood pressure of each of all the subjects was recorded pre-operatively. The simple extraction cases underwent local anaesthesia using 2% lidocaine 2% with 1:100,000 epinephrine. The tooth was subluxated and extracted by the appropriate instruments. The surgical extraction was also performed under local anaesthesia using 2% lidocaine with 1:100,000 epinephrine in which a flap was raised and the tooth was surgically extracted.

A figure of eight suture was applied. The subjects were then asked to apply pressure on a piece of sterile gauze for 30 min and were then re-evaluated for bleeding. If the subjects did not have any signs of bleeding at that time, they were discharged and contacted by phone 12 h, 24 h, 48 h and 5 days post-operatively. If there was any bleeding, they were re-examined, new gauze was placed and re-evaluated after 30 min.

Any active oozing from the socket after 30 min was considered immediate bleeding. If the subjects reported during the phone communication that there was bleeding, they were instructed to return for further evaluation. Antibiotics were not prescribed for any of the subjects and the only pain medication used was paracetamol 500 mg one tablet every 6 h in all subjects. However, the ASA groups were instructed to continue their medications. Subjects who took any other pain medication were excluded from the study.

## 4. Results

In Group 1A, out of the 53 subjects, only two (3.8%) subjects had oozing of blood after 30 min of extraction. One female indicated that she still had oozing of blood 12 h post-operatively. The patient was seen, re-evaluated and asked only to apply pressure over the gauze which controlled the bleeding. She was contacted 24 h and 48 h post-operatively and she indicated no further bleeding. None of this group required any medical attention and only one subject came for re-evaluation after 12 h. None of them complained after 24 h or 48 h post-operatively.

In Group 1B, out of the 49 subjects who underwent surgical procedures to remove a tooth, only three (6.1%) subjects had oozing of blood after 30 min on the surgical site. However, after 12 h, only one subject complained of oozing of blood. The patient was seen and was well after applying pressure. One male complained of bleeding after 24 h. He was seen and after applying pressure, the oozing stopped. After 48 h, none of the subjects in Group 1B had any bleedings.

In Group 2A, only one subject presented with minor oozing after 30 min. After 12 h however, none of the subjects had any complaints. In Group 2B, one subject presented with oozing after 30 min and the same subject was seen after 12 h with mild oozing controlled after applying pressure to the site. All subjects in Groups 2A and 2B indicated no bleeding after 24 h and 48 h post-operatively. None of the subjects showed delayed bleeding after 5 days. A summary of these findings is shown in Table 1.

## 5. Discussion

ASA is recommended in many cases as a prevention of emboli formation and as an analgesic. Dental clinicians are frequently faced with the question of whether or not ASA should be stopped or continued before extraction. Madan et al. (2005) investigated bleeding in 51 patients taking aspirin who underwent extraction of teeth. Only one patient had bleeding which was controlled by local measures. The authors recommended continuing ASA during dental extraction (Madan et al., 2005). Garnier et al. (2007) did extraction of 218 teeth and only three extraction sites had prolonged bleeding.

Hemelik et al. (2006) performed extraction in two groups: Group 1 patients on 100 mg ASA daily and Group 2 did not

**Table 1** Post-extraction bleeding in the study and control groups.

Group	Number of subjects	30 min after extraction	12 h post-operative	24 h post-operative	48 h	5 days
1A	53	2	1	0	0	0
1B	49	3	1	1	0	0
2A	41	1	0	0	0	0
2B	46	1	1	0	0	0

Groups 1A and 1B Experimental; Groups 2A and 2B Control.

take any medication which served as a control group. The findings indicated that bleeding occurred in 1.54% in the ASA group and 1.59% in the control group, respectively. In the present study, bleeding occurred in about 2% of patients in both the control and study groups following surgical extractions after 12 h. However, after 48 h both groups demonstrated no bleeding. Morimoto et al. (2008) performed extraction on 87 patients who had taken antiplatelets and found that the bleeding occurred in 2.2%. The findings of the present study are in agreement with those of Morimoto.

Brennan et al. (2008) studied 36 patients divided into two groups: Group 1 patients received 325 mg ASA daily and Group 2 served as control. They investigated the bleeding time. No significant differences were found between the two groups in the bleeding time. They recommended not stopping ASA before the surgical procedure.

Some authors indicated that patients responded differently to the medication they were using. Some patients were hyper responders and may have prolonged bleeding. Sonksen et al. (1999) studied bleeding time in subjects taking ASA. Group 1 included 17 patients taking 75 mg, Group 2 included 16 patients who were taking 300 mg, Group 3 served as a control group. Significant differences in bleeding time were found between the ASA users and the control group. In addition, some cases in Group 1 (three patients) and in Group 2 (five patients) showed high bleeding time and they were considered hyper responders (Sonksen et al., 1999).

Ardekian et al. (2000) studied bleeding time in two groups: one used ASA and one served as control. The bleeding time was 1.8/0.47 min in the control group and in the ASA group, it was 3.1/0.65 min. They had four patients from ASA group and two patients from the control group who had prolonged bleeding after extraction. They had to use 10% tranexamic acid and antifibrinolytic agent to stabilize the clots (Ardekian et al., 2000). This phenomenon of hyper response to ASA may explain why some patients may have more oozing of blood compared to others, even if they are taking the same doses.

Bartlett (1999) investigated minor and significant complications after cutaneous minor surgery. The study was designed to have two groups. Group one with 52 patients who continued ASA whereas 119 patients served as a control group. The results indicated that 1.9% demonstrated minor complication in ASA users versus 3.3% in the control group. However, the significant complication was 3.8% in ASA user and 4.2 in the control group (Bartlett, 1999). The finding indicated that ASA use did not cause post-surgical complications similar to the findings of the present study. Shalom and Wang (2000) found no difference in the bleeding pattern between patients who had taken ASA and the control group during excision of a cutaneous lesions.

The issue of significant blood loss during minor oral surgery was examined by Patridge et al. (2008) who concluded that patients who had taken ASA demonstrated blood loss 1.97 g per unit of surgery compared to 1.96 g per unit of surgery in the control group. Therefore, no significant statistical difference between the two groups was found. This finding supported the notion that ASA should not be stopped before minor oral surgery.

The issue of continuing ASA during major surgery has also been investigated. Dhiwakar et al. (2006) performed major surgical procedure in patients who had taken ASA and they recommend stopping ASA. Contrary to that, Anekstein et al. (2004) concluded it is safe to do femoral fracture repair if the patient had taken ASA. However, they required 0.5 L more of blood. Korinth et al. (2007) did a survey asking neurosurgeon about patients taking ASA in cases of spinal surgery and found 80% of the neurosurgeons had a policy to discontinue ASA preoperatively. Potoski and Amenabar (2007) and many others recommended not stopping ASA for minor oral surgery as what we recommend.

## 6. Conclusion

ASA is a widely used medication and it functions as analgesic and antiplatelets. This study demonstrated that extraction of teeth in patients taking 81 mg of ASA did not cause significant bleeding post-operatively. All post-operative bleeding was controlled by using good local measures. For minor oral surgery procedures, we do not recommend that patients using ASA should stop taking the medication.

## References

- Aframian, D.J., Lalla, R.V., Peterson, D.E., 2007. Management of dental patients taking common hemostasis altering medication. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics* 103, s45.
- Anekstein, Y., Tamir, E., Halperin, N., Mirovsky, Y., 2004. Aspirin therapy and bleeding during proximal femoral fracture surgery. *Clinical Orthopaedics and Related Research* 418, 205–208.
- Anonymous, 2002. Drug Information for Health Care Professional. United States Pharmacopeia Drug Information, vol. 1. 22nd ed., Greenwood Village Co., Micromedex, 2002, p. 2591.
- Antiplatelets Trialists' Collaboration, 1994. Collaborative overview of randomised trials of antiplatelet therapy. Prevention of death, myocardial infarction, and stroke by prolonged antiplatelet therapy in various categories of patients. *British Medical Journal* 308, 81–106.
- Ardekian, L., Gaspar, R., Peled, M., Brener, B., Laufer, D., 2000. Does low-dose aspirin therapy complicate oral surgical procedures? *Journal of the American Dental Association* 131, 1398, 1401–1402.

- Bartlett, G.R., 1999. Does aspirin affect the outcome of minor cutaneous surgery. *British Journal of Plastic Surgery* 52, 214–216.
- Brennan, M.T., Wynn, R.L., Miller, C.S., 2007. Aspirin and bleeding in dentistry: an update and recommendations. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics* 104, 316–323.
- Brennan, M.T., Valerian, M.A., Noll, J.L., Napenas, J.J., Kent, M.L., Fox, P.C., Sasser, H.C., Lockhart, P.B., 2008. Aspirin use and post operative bleeding from dental extraction. *Journal of Dental Research* 87, 740–744.
- Dhiwakar, M., Khan, N.A., McClymont, L.G., 2006. Surgical resection of cutaneous head and neck lesions does aspirin use increase hemorrhagic risk? *Archives of Otolaryngology-Head and Neck Surgery* 132, 1237–1241.
- Garnier, J., Truchot, F., Quero, J., Meziere, X., Clipet, F., Alno, N., Frachon, X., Delanoue, O., Bader, G., Lejeune, S., Limbour, P., De Mello, G., 2007. 218 tooth extraction in patients taking platelet aggregation inhibitors. *Revue de Stomatologie et de Chirurgie Maxillo-faciale* 108, 407–410.
- Hemelik, M., Wahl, G., Kessler, B., 2006. Tooth extraction under medication with acetylsalicylic acid. *Mund Kiefer Gesichtschir* 10, 3–6.
- Korinth, M.C., Gilsbach, J.M., Weinzierl, M.R., 2007. Low dose aspirin before spinal surgery: result of a survey among neurosurgeons in Germany. *European Spine Journal* 16, 365–372.
- Krishnan, B., Shenoy, N., Alexander, M., 2008. Exodontia and antiplatelet therapy. *Journal of Oral and Maxillofacial Surgery* 66, 2063–2066.
- Madan, G.A., Madan, S.G., Madan, G., Madan, A.D., 2005. Minor oral surgery without stopping daily low dose aspirin therapy: a study of 51 patients. *Journal of Oral and Maxillofacial Surgery* 63, 1262–1265.
- Marshall, P.W., Williams, A.J., Dixon, R.M., Growcott, J.W., Warburton, S., Armstrong, J., Moores, J., 1997. A comparison of the effects of aspirin on bleeding time measured using the PFA-100 in healthy volunteers. *British Journal of Clinical Pharmacology* 44, 151–155.
- Morimoto, Y., Niwa, H., Minemastue, K., 2008. Hemostatic management of tooth extractions in patients on oral antithrombotic therapy. *Journal of Oral and Maxillofacial Surgery* 66, 51–57.
- Patridge, C.G., Campbell, J.H., Alvarado, F., 2008. The effect of platelet altering medication on bleeding from minor oral surgery procedures. *Journal of Oral and Maxillofacial Surgery* 66, 93–97.
- Potoski, M., Amenabar, J.M., 2007. Dental management of patient receiving anticoagulant or antiplatelet treatments. *Journal of Oral Science* 49, 253–258.
- Shalom, A., Wang, L., 2000. Outcome of aspirin use during excision of cutaneous lesions. *Annals of Plastic Surgery* 50, 296.
- Sonksen, J.R., Kong, K.L., Holder, R., 1999. Magnitude and time course of impaired primary haemostasis after stopping chronic low and medium dose aspirin in healthy volunteers. *British Journal of Anaesthesia* 82, 360–365.
- Yokoyama, T., Yamasaki, F., Yamashita, K., Manabe, M., Suwa, K., 2008. Bleeding time prolonged by daily low dose aspirin is shortened by one medium dose aspirin. *Acta Anaesthesiologica Scandinavica* 52, 1126–1130.

حامض الساليسليك (الاسبرين) يستخدم لعلاج الالام و مخفض للحرارة و مانع للالتهابات. كذلك يستخدم لمنع تجمع الصفائح الدموية. لقد نظرة دراسات عديدة العلاقة بين الاسبرين و النزيف. هذة الدراسة عملة على 189 مريض. المجموعة الاولى مرضى يتعاطون 81 مج من الاسبرين وعمل لهم خلع اسنان بسيط. المجموعة الثانية مرضى يتعاطون 81 مج من الاسبرين وعمل لهم خلع اسنان جراحي. المجموعة الثالثة مرضى لا يتعاطون 81 مج من الاسبرين وعمل لهم خلع اسنان بسيط. المجموعة الرابعة مرضى لا يتعاطون 81 مج من الاسبرين وعمل لهم خلع اسنان جراحي. النتائج اظهره انه بعد 48 ساعه وكذلك بعد 5 ايام من خلع الاسنان الجميع لم يكن لديهم حالات نزيف. توصي الدراسه بخلع اسنان المرضى الذين يتعاطون 81 مج من الاسبرين