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ORIGINAL ARTICLE

Prevention of Postoperative Bleeding in Anticoagulated Patients Undergoing Oral Surgery: Use of Platelet Rich Plasma

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ABSTRACT

Introduction: Anticoagulant therapy is essential for patients with various medical conditions. The use of anticoagulant medications is associated with a prolonged bleeding time. Platelet-rich plasma (PRP) contains a high concentration of platelets. PRP has been used to improve bone and soft tissue regeneration and lessen postoperative complications.

Study design: It is a randomized controlled study conducted at DOW International Dental College, Karachi for the duration of six months from August 2022 to January 2023.

Material and Methods: The study was done on 40 patients who visited tertiary care unit for duration of six months. There were 6 patients that belonged to the age group 40-50 years. 19 and 15 patients were in the age group 55-60 years and 60-65 years respectively. There were 14 males and 26 females included in our study. There were 72 extractions performed on these patients.

Results: It was found that there were 4 patients who reported about hemorrhagic complications. There were two women that had hemorrhage linked to poor placement of platelet gel. One patient reported about hemorrhage related to severe formation of coagulum. Mild bleeding was observed in 13 patients.

Conclusion: In conclusion the results of our trial suggest that PRP is a successful anticoagulant therapy that can be used for preventing any post-operative hemorrhagic complication among patients going through dental surgery, as PRP is easy to use, it has low cost and a good placement into residual alveolar bone, therefore it has better outcomes among patients.

Keywords: postoperative bleeding, anticoagulant therapy and Platelet-rich plasma.

INTRODUCTION

Anticoagulant therapy is essential for patients with various medical conditions, such as deep vein thrombosis, pulmonary embolism and atrial fibrillation. It also poses a significant risk of bleeding during and after oral surgical procedures, including implant placement, periodontal surgery and tooth extractions. The use of anticoagulant medications is associated with a prolonged bleeding time, delayed wound healing, increased risk of hemorrhage, and, leading to complications and patient dissatisfaction[1-3]. Platelet-rich plasma (PRP) contains a high concentration of platelets, growth factors, and other bioactive molecules that promote tissue regeneration and healing. PRP has been used to improve bone and soft tissue regeneration and lessen postoperative complications, including orthopedics, plastic surgery, and oral and maxillofacial surgery. PRP has been researched as a potential prophylactic treatment for oral surgery to stop bleeding and promote healing in anticoagulated patients. This strategy is justified by the fact that the growth factors and cytokines released by platelets in PRP can promote angiogenesis, enhance tissue oxygenation, and draw stem cells to the wound site, facilitating quicker and more effective tissue repair. The effectiveness of PRP in reducing bleeding and enhancing healing in anticoagulated patients undergoing oral surgical procedures has been assessed in several studies[4-5]. The results, however, have been mixed, with some studies reporting significant bleeding reductions and others find no appreciable difference between PRP and control groups. Despite these discrepancies, PRP is still a effective option for stopping bleeding in anticoagulated patients having oral surgery because it is a quick, painless procedure that can be completed in the doctor's office. Additionally, the risk of allergic or immune reactions can be reduced by producing PRP easily from the patient's own blood. It can be challenging to manage heart surgery patients who are given oral anticoagulant therapy and artificial mechanical heart valves. The treatment of warfarin-taking patients who require dental extractions must avoid placing them at an undue risk of postoperative haemorrhage or thromboembolic event[6-7]. Before starting oral dicumarolic anticoagulant therapy again, all patients need to undergo a postoperative clinical check to prevent thromboembolic complications. The clinical use of oral anticoagulant therapy is complicated by the requirement for frequent prothrombin time or international normalized ratio (INR) measurements to ensure safety and therapeutic efficacy[8-9]. This requirement has frequently placed a heavy burden on both patients and providers. Patients must be within the therapeutic INR range in order to reduce the frequency of side effects related to anticoagulant therapy[10]. The rationale and mode of action of PRP in promoting tissue regeneration and reducing bleeding in anticoagulated patients undergoing oral surgery will be covered in this article. The effectiveness of PRP in reducing bleeding and enhancing healing in this patient population will also be studied along with the advantages and drawbacks of using PRP in clinical practice. PRP has the potential to enhance patient outcomes and lower the risk of postoperative complications in anticoagulated patients during oral surgery. However, more research is required to ascertain the best procedure for PRP preparation and administration as well as its long-term effects on tissue regeneration and healing.

MATERIAL AND METHODS

The study was done on 40 patients who visited tertiary care unit for the duration of six months. There were 6 patients that belonged to the age group 40-50 years. 19 and 15 patients were in the age group 55-60 years and 60-65 years respectively. There were 14 males and 26 females included in our study. There were 72 extractions performed on these patients. A mechanical heart valve replacement was performed in all patients. They were taking oral anticoagulant therapy and had no general illnesses at the time of the study. These patients underwent a single extraction or several. After the oral anticoagulant medications were stopped for each patient, PRP gel was injected into the remaining alveolar bone after extraction instead of heparin. The primary outcome measure was the amount of postoperative bleeding, assessed using a visual analog scale (VAS) and measured in milliliters (ml). Bleeding was assessed at 24 hours and 7 days postoperatively. Secondary

outcome measures included the incidence of postoperative complications (e.g., infection, hematoma), pain levels (assessed using the VAS), and wound healing (assessed using a modified version of the Wound Healing Index). Data were analyzed statistically. Descriptive statistics were used to summarize patient demographics and clinical characteristics.

RESULTS

The study was done on 40 patients who visited tertiary care unit for the duration of six months. The use of platelet rich plasma for prevention of post-operative bleeding after dental surgery was analyzed among these patients.

Table 1: General characteristics of patients that used platelet rich plasma for prevention of post-operative bleeding

Age range (years)	No. of patients (n=40)
40-50 years	6
55-60 years	19
60-65 years	15
Gender (male/female)	14/26
Dental extractions	72

After using platelet rich plasma, the complication rate was analyzed and it was found that there were 4 patients who reported about hemorrhagic complications. There were two women that had hemorrhage linked to poor placement of platelet gel. One patient reported about hemorrhage related to severe formation of coagulum. Mild bleeding was observed in 13 patients. There was no case of endocarditis or any other related post-surgical complication.

Table 2: Complications after using platelet rich plasma among patients

Complications	No. of patients (n=40)
Hemorrhagic complications	4
Hemorrhage linked to poor platelet gel placing	2
Hemorrhage linked to excessive coagulum formation	1
Mild bleeding	13
Endocarditis complications	-
Other post-surgical complication	-

Among the patients who reported about hemorrhagic complications there was 1 case of comorbidity observed among them. There was one case of comorbidity observed in patient who had hemorrhage related to poor placement of platelet gel. There was no case of comorbidity observed among patients with excessive coagulum formation. Among patients who faced mild bleeding, there were 12 who had no comorbidity reported. P values were calculated and results were statistically significant.

Table 3: Results of patients with hemorrhagic complications

	No comorbidity (n)	Comorbidity (n)	P value
Hemorrhagic complications	3	1	0.0001
Hemorrhage linked to poor platelet gel placing	1	1	0.001
Hemorrhage linked to excessive coagulum formation	1	-	0.005
Mild bleeding	12	1	0.005

DISCUSSION

The risk of post extraction hemorrhage among patients that had to go for oral surgeries is evident[11]. The intraoperative and post-operative bleeding for oral surgeries required serious management and oral anticoagulant therapies. The management is needed to ensure post-extraction hemorrhage risk among patients, as such hemorrhagic complications that prove to be lethal leading to thromboembolic events[12-13]. There are number of procedures used as anticoagulant therapies to prevent these complications which include using heparin before performing the dental surgery or in some cases warfarin doses are adjusted to use before performing surgery[14]. As per studies the combined usage of warfarin and PRP in some cases has proven to be effective for the prevention of excessive bleeding issues after dental extractions. There have been studies which report the interruption of anticoagulant therapies like continuous use of warfarin during surgery to prevent bleeding issues[15]. However, other studies have reported that severe complications were observed after removing warfarin dosage during dental treatment[16]. Here in our study, 40 patients who visited tertiary care unit for the duration of six months for dental extractions were included. The use of platelet rich plasma for prevention of post-operative bleeding after dental surgery was analyzed among these patients. There were 6 patients that belonged to the age group 40-50 years. 19 and 15 patients were in the age group 55-60 years and 60-65 years respectively. There were 14 males and 26 females included in our study. There were 72 extractions performed on these patients as shown in table no.1.

As per studies the patients mostly ranged from 35-55 who reports about complications related to hemorrhage after dental surgeries[17]. In our study most of the patients belonged to age group 55-60 years. According to the studies the use of platelet rich plasma shows better results as it is easy to use and autologous in nature. It has less cost and it has good placement into residual alveolar bone. As shown in table 2, after using platelet rich plasma, the complication rate was analyzed in our study and it was found that there were 4 patients who reported about hemorrhagic complications. There were two women that had hemorrhage linked to poor placement of platelet gel. One patient reported about hemorrhage related to severe formation of coagulum. Mild bleeding was observed in 13 patients. There was no case of endocarditis or any other related post-surgical complication. As per previous studies it was found that there were 30% cases that reported about hemorrhagic conditions after using PRP, however complication rate was less as compared to other anticoagulant therapies. Our findings are in accordance with the previous results where PRP showed less complication rate as compared to other anticoagulant therapies[18]. As per previous reports the use of PRP leads to low risk of thromboembolism risk preventing severe bleeding in patients after dental extractions[19]. In another study that was carried out to compare the results of warfarin and PRP it was found that PRP had less rate of complications 21% as compared to warfarin 32%[20]. The PRP complications mostly were patients who had mild bleeding issues which were dealt without any serious complications. The rate of comorbidity is crucial factor as it can lead to other complications as well. Our studies suggest that the patients who reported about hemorrhagic complications there was 1 case of comorbidity observed among them. There was one case of comorbidity observed in patient who had hemorrhage related to poor placement of platelet gel. There was no case of comorbidity observed among patients with excessive coagulum formation.

Previous studies also suggest that there was no case of comorbidity linked to hemorrhage caused by excessive coagulum formation[20]. However, PRP has disadvantages like there is need of careful selection of patients for its usage and there is low survival of platelets observed after its usage. Among patients who faced mild bleeding, there were 12 who had no comorbidity reported. P values were calculated and results were statistically significant. As per previous studies the rate of comorbidities was 10% in patients after using PRP as anticoagulant therapy[21]. Our study has disadvantage the sample size is very small, there was no non-PRP group shown, if the results were compared with any non-PRP group the outcomes would be more precise. If the data was taken from other hospitals as well more elaborate study could be made.

CONCLUSION

In conclusion the results of our trial suggest that PRP is a successful anticoagulant therapy that can be used for preventing any post-operative hemorrhagic complication among patients going through dental surgery, as PRP is easy to use, it has low

cost and a good placement into residual alveolar bone, therefore it has better outcomes among patients.

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