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ORIGINAL RESEARCH

Assessment of efficacy of platelet rich plasma on pain and mouth opening after surgical extraction of mandibular third molars

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ABSTRACT

Background: Surgical extraction of mandibular third molar teeth is a commonly performed treatment in oral and maxillofacial surgery departments. The present study was conducted to assess efficacy of platelet rich plasma (PRP) on mouth opening and pain after surgical extraction of mandibular third molars. **Materials & Methods:** 80 patients with impacted mandibular wisdom teeth of both genders were divided into 2 groups of 40 each. Group I patients were given PRP and group II was control group (Non- PRP). The pain score and trismus was measured using Vernier caliper. **Results:** The mean pain score (VAS) before the surgery was 3.2 and 4.1, immediately after surgery was 2.8 and 4.0, pain (3rd day) was 1.7 and 3.4 and pain (7th day) was 1.1 and 2.6 in group I and II respectively. The difference was significant (P< 0.05). Trismus was present in 6 in group I and 15 in group II. The difference was significant (P< 0.05). **Conclusion:** Leukocyte-rich platelet rich plasma (PRP) has the potential to accelerate the healing process, and it can also reduce discomfort and trismus (the involuntary opening of the mouth) following surgical removal of mandibular third molar teeth.

Keywords: mandibular third molar, trismus, pain

INTRODUCTION

Surgical extraction of mandibular third molar teeth is a commonly performed treatment in oral and maxillofacial surgery departments. The most typical advantage of surgically extracting a third molar teeth is the reduction of pericoronitis symptoms and possible repercussions.[1] However, due to a postoperative inflammatory reaction, lower impacted wisdom tooth extraction via surgery typically results in post-surgical sequelae such pain, trismus, and swelling. The disruptions in the healing of the wound following extraction and the physiological aftereffects of third molar surgery can lead to major difficulties that might negatively impact the patient's quality of life.[2]

An autologous concentration of platelets suspended in plasma is known as platelet rich plasma (PRP). Its curative effect is predicated on the concentration of growth factors such as endothelial growth factors, vascular endothelial growth factor, transforming growth factor-b (TGFb1 & TGFb2), platelet derived growth factor (PDGF), and the three isomers of platelet-derived growth factors (PDGF-aa, PDGF-bb, and PDGF-ab). When administered to bone lesions, these growth factors are thought to promote tissue repair by facilitating chemotaxis, mitogenesis, angiogenesis, and collagen matrix formation.[3]

Using a millimeter caliper, the mouth opening is the greatest distance between the mandibular and maxillary central incisors.[4] Masticatory muscle inflammation is a common aftereffect of surgically extracting mandibular third molars, or lower wisdom teeth. In 10 to 14 days, the disease normally resolves on its own; nevertheless, during this time, food and dental hygiene should be neglected. PRP accelerates healing by concentrating growth factors, which can reduce pain, trismus, and inflammation.[5] The present study was conducted to assess efficacy of platelet rich plasma (PRP) on mouth opening and pain after surgical extraction of mandibular third molars.

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MATERIALS & METHODS

The present study was conducted on 80 patients with impacted mandibular wisdom teeth of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 40 each. Group I patients were given PRP and group II was control group (Non- PRP). The pain score was measured using the visual analogue scale (VAS) and trismus was measured using Vernier caliper before the surgery, immediately after surgery, on 3rd and 7th follow up visits. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Assessment of pain (VAS)

Pain (VAS)	Group I	Group II	P value
before the surgery	3.2	4.1	0.01
immediately after surgery	2.8	4.0	
Pain (3rd day)	1.7	3.4	
Pain (7th day)	1.1	2.6	

Table I, graph I shows that mean pain score (VAS) before the surgery was 3.2 and 4.1, immediately after surgery was 2.8 and 4.0, pain (3rd day) was 1.7 and 3.4 and pain (7th day) was 1.1 and 2.6 in group I and II respectively. The difference was significant (P< 0.05).

Graph I Assessment of pain (VAS)

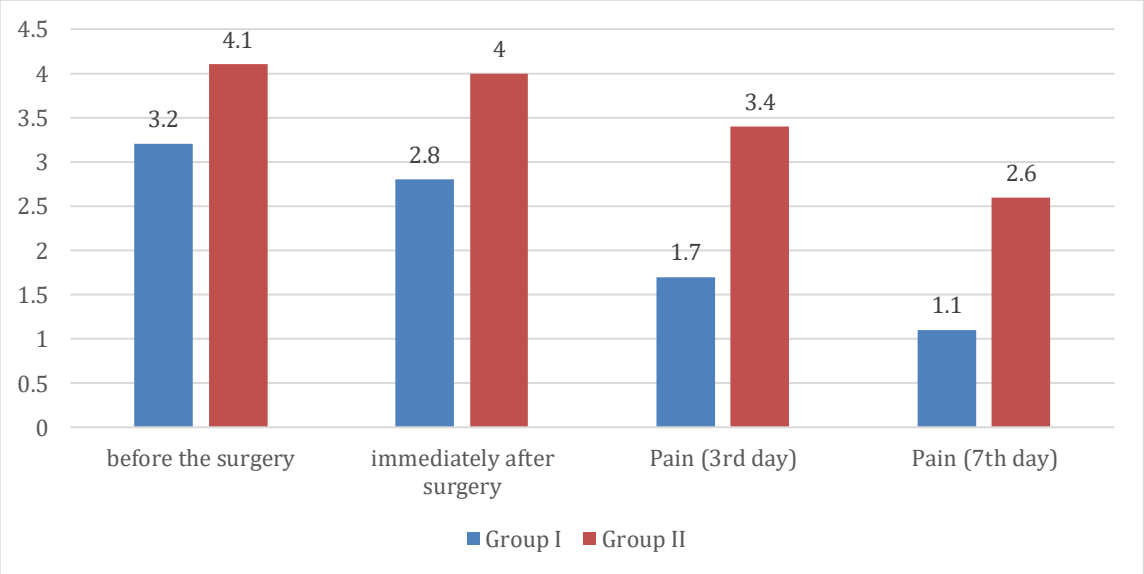

Table III Assessment of trismus

Trismus	Group I	Group II	P value
Yes	6	15	0.01
No	34	25	

Table II, graph I shows that trismus was present in 6 in group I and 15 in group II. The difference was significant (P< 0.05).

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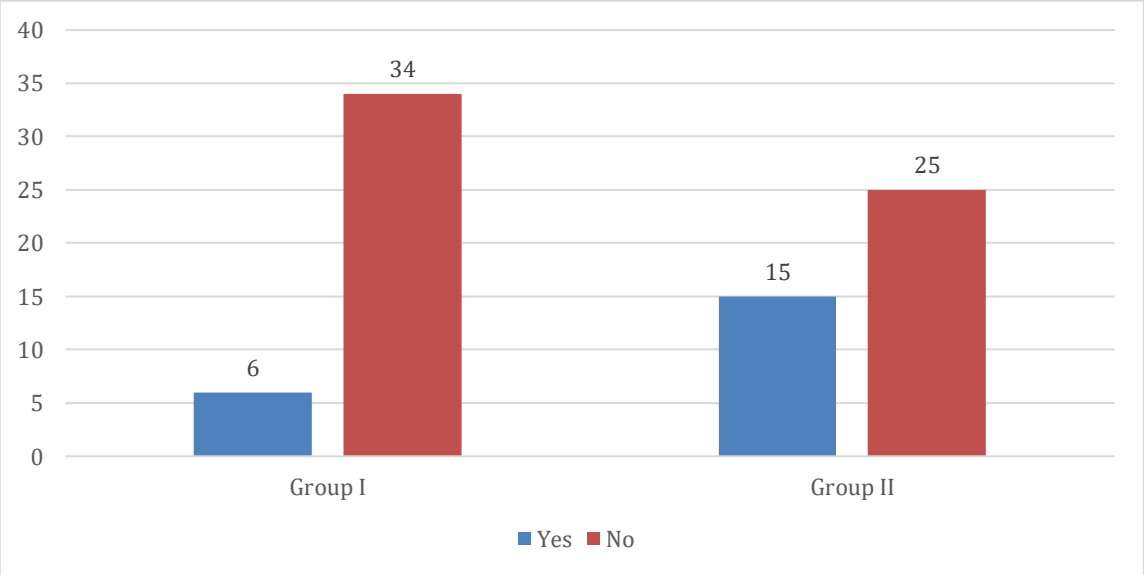
Graph I Assessment of trismus



DISCUSSION

All around the world, oral surgery departments undertake one of the most common procedures: the extraction of an impacted wisdom tooth.[6,7] After surgically extracting impacted third molars, oral surgeons are continuously looking for strategies to promote wound healing, improve bone healing, and reduce post-operative complications such discomfort, trismus, and dry socket.[8] The use of platelet rich plasma (PRP) in the extraction socket right after extraction, especially following the surgical extraction of third molar teeth, is one of the newest and most inventive techniques.[9] From hemostasis to the release of growth factors that promote early wound healing, decreased pain, and trismus with early bone development, this platelet rich in plasma serves a variety of purposes.[10,11] The present study was conducted to assess efficacy of platelet rich plasma (PRP) on mouth opening and pain after surgical extraction of mandibular third molars.

We found that mean pain score (VAS) before the surgery was 3.2 and 4.1, immediately after surgery was 2.8 and 4.0, pain (3rd day) was 1.7 and 3.4 and pain (7th day) was 1.1 and 2.6 in group I and II respectively. Hanif et al[12] conducted a study on 130 patients with impacted mandibular wisdom teeth which were divided equally into two equal groups. The pain score was measured using the visual analogue scale (VAS) and trismus was measured using Vernier caliper before the surgery, immediately after surgery, on 3rd and 7th follow up visits. The mean postoperative pain on 7th day was significantly lower in the PRP group with statistically significant.

We found that trismus was present in 6 in group I and 15 in group II. Gawande et al[13] assessed the efficacy of platelet rich plasma (PRP) in bone regeneration. 20 patients having bilateral mandibular third molar impaction with similar angulations were included. The extraction socket was packed with PRP on one side and the other side was sutured without PRP. The bone density of both extraction sockets were evaluated radiographically using gray level histogram and compared periodically. Postoperative pain and edema were also assessed. The result of the study shows rapid bone regeneration in the extraction socket treated with PRP when compared with the socket without PRP. Also there was less postoperative discomfort on the PRP treated side.

Gandevivala et al[14] compared the efficacy of autologous platelet-rich plasma (PRP) in the third molar impactions, with respect to: pain, swelling, healing, and periodontal status distal to the second molar in patients who need surgical removal of bilateral impacted mandibular third molars. The outcome variables were pain, swelling, wound healing, and periodontal probe depth that were follow-up period of 2 months. There was a difference in the pain (0.071) and facial swelling (0.184), reduction between test and control on day 3, but it was not found to be significant. Periodontal pocket depth (0.001) and wound healing (0.001) less in case group compared with the control group was found to be significant.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that leukocyte-rich platelet rich plasma (PRP) has the potential to accelerate the healing process, and it can also reduce discomfort and trismus (the involuntary opening of the mouth) following surgical removal of mandibular third molar teeth.

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