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Comparison of Platelet-rich fibrin with Zinc oxide eugenol for the pain management of Alveolar Osteitis.

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ABSTRACT… Objective: To compare and evaluate the efficacy of platelet-Rich-Fibrin and zinc Oxide Eugenol in pain relief management patients presenting Alveolar Osteitis. **Study Design:** Prospective study. **Setting:** Department of Oral diagnosis, liaquat university of medical and health sciences Hyderabad. **Period:** 1st March 2021 to 31st August 2021. **Methods:** Total 80 patients with alveolar osteitis were involved in the study. Patients were equally randomly categorized into two groups A and B, the intensity of pain was measured by VAS scale on prospective days Platelet-rich-fibrin treatment was given to group A, while Zinc Oxide Eugenol was given to group B. VAS score was recorded on every prospective day and results were recorded on an MS Excel sheet. **Results:** Out of 80 patients of AO, 28 were male and 52 were female patients, the mean age of females was 34.25 while the male mean age was 38.5. The mean pain score on 1st prospective day was 3.8 ± 1.3 for group A while group B Was 7.5 ± 1.7. On 3rd prospective day of the trial, the mean pain score was Group A was 2.9 ± 1.1 and Group B was 4.7 ± 1.3. On day 5th the mean pain score of Group A was 1.1 ± 0.9 and Group B was 3.0 ± 1.0 and on the last 7th prospective day the mean score of Group A was 1.0 ± 0.6 and Group B was 1.8 ± 0.8. **Conclusion:** The study observed PRF is more effective than ZOE in pain management patients presenting AO.

Key words: Alveolar Osteitis, Pain, Zinc Oxide Eugenol.

INTRODUCTION

Alveolar osteitis, is also recognized as a dry socket and a well-known impediment after withdrawal or medical elimination of the tooth.[1] it is a painful situation that can occur after tooth withdrawal. It occurs when the blood clot that procedures in the socket where the tooth was removed becomes dislodged or dissolves before the wound has had a chance to heal.[2] This can expose the underlying bone and nerves, causing severe pain and discomfort. Symptoms of alveolar osteitis include severe pain in the socket, bad breath, a disagreeable palate in the mouth, and visible bone in the socket.[3] Treatment typically involves managing pain with over-the-counter painkillers or prescription medication, cleaning the socket to remove any debris or bacteria, and placing a medicated dressing or packing in the socket to promote healing.

The exact cause of alveolar osteitis is not fully assumed, but there are several factors that are believed to raise the risk of emerging this condition after tooth extraction. Previous studies reported that it may increase the risk of developing alveolar osteitis including smoking, poor oral hygiene, a history of previous dry sockets, traumatic extractions, the use of oral contraceptives, and certain medical conditions such as osteoporosis or clotting disorders.[4] One of the generally acknowledged processes of dry socket development is elevated fibrinolytic activity, which can be caused by a number of different things such as traumatic extraction, smoking, contraceptive use, and pre-extraction infections. This increased fibrinolytic activity can lead to the premature loss of the blood clot that forms in the socket after a tooth extraction, leading to the development of alveolar osteitis.[5]

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Alveolar Osteitis is the most commonly encountered postoperative complication following the extraction of teeth by dentists, and it is always tried to manage the postoperative complication to prevent the dry socket to maintain the quality of life of patients.[6] A dry socket is most frequently noted after the tooth extraction, especially in the surgical extraction of the tooth, severe pain and delayed healing cause discomfort and painful conditions for the patients for several days.[7] Therefore dentists and clinicians always try to prescribe better treatment for early healing and pain management. There are many pharmacological mediators such as zinc oxide eugenol (ZOE), iodoform, butylparaminobenzoate , c hlorhexidine, chlorobutanol, acemannan, guaiacol, alvogyl and neocone, are available for the management of dry socket, other than this Platelet rich fibrin (PRF) technique is vastly used in much healing procedure, and research had reported effective treatment.[8] Therefore the learning was aim to associate platelet-rich Fibrin and "zinc oxide eugenol" (ZOE) to determine an effective treatment for alveolar osteitis (Dry socket).

"Choukroun's platelet-rich fibrin" (PRF) is a platelet concentrate of the second generation.[9] Using the patient's own blood to promote the healing and regeneration of tissue is called platelet-rich fibrin (PRF) therapy. A centrifuge is used for separating the plasma from the blood that has been collected from the patient. In order to promote healing at the location of injury or tissue damage, platelet-rich plasma is extracted from the patient's blood and reintroduced into the body through injection. Platelets are well known for their clotting properties, but they additionally include growth factors that can drive cell reproduction and induce regeneration of tissues or recovery in the treated region.[10]

Zinc oxide eugenol (ZOE) is a medicated dressing used for the management of dry socket, it is also proven effective, in pain relief and promote the healing of dry socket.[11] Other than this ZOE has also a major role in filling and other procedures in the field of dentistry. The purpose of this learning is to compare the effectiveness of Platelets rich plasma (PRP) and "zinc oxide eugenol" (ZOE) for the management of Alveolar Osteitis (Dry socket).

METHODS

This potential trial was carried out at the Department of oral diagnosis, liaquat university of medical and health sciences hyderabad Sindh, from 1st March 2021 to 31st August 2021. The Ethical Committee of Isra University Hyderabad reviewed and approved (IU/RR-10/AQK/2021/83 Dated: 12/02/2022) the study protocol.

During the study trial, total 80 number of patients were enrolled by following the eligibility criteria of the study. Patients of both genders , having complained of continuous pain and had a dry socket devoid of clot that was unable to heal even after medication, pregnant women, subjects with any systematic disease, and those who were unable to follow the study guidelines were excluded from the study.

Patients were equally randomly categorized into two groups A and B, Platelet-rich-fibrin (PRF) treatment was given to group A, while Zinc Oxide Eugenol (ZOE) was given to group B. Before giving treatment patients' demographic features age, sex, and habit of smoking were recorded on proforma, patients were advised for the follow-up examination on the 1st, 3rd, 5th, and 7th day. Group A patients established PRF and group B received ZOE as a treatment protocol. Pain severity of both groups was measured via Visual Analogue Scale (VAS) score on the 1st, 3rd, 5th, and 7th day after treatment. VAS is labeled from 0 to 10, with 0 representing no pain and 10 signifying the most severe pain possible; thus, a higher VAS score indicates a worse prognosis.

PRF was prepared by following the convention of Choukroun et al, PRF was prepared by getting the patient's own blood from a vein into a tube without anticoagulation, and the blood tube was centrifuged by placing an equal volume of blood in at 3500 rpm for 15 minutes until a viscous, thick, rubbery gel was founded. After centrifugation, the plasma, which is low in coagulation factors, is separated from blood cells and eliminated, while fibrinogen clot, which is high in clotting factors, is collected in the center of the tube and used in the

platelet-rich fibrin (PRF) treatment.

In Group A Patient's alveolar osteitis area was cleaned with saline to remove debris and blood clot. Prepared PRF was given at the site of the dry socket. In group B patients were administered ZOE by a gauze over the dry socket and patients were advised for follow-up examination on the 1st, 3rd, 5th, and 7th day. VAS score was recorded on each day. The data was analyzed by SPSS 2.0 version.

RESULTS

The present study enrolled total 80 number of patients by randomized sample technique, the ratio of females was observed high at 52 (65%) as compared to male 28 (35%). The study included patients of age limit 18-65, the mean age of females was 34.25 while male mean age was 38.5. The study also recorded the habit of smoking in patients, the male ratio was (76%) higher as compared to females (24%) in all smoker patients. (Table-I elaborated demographical features of patients).

Pain measurement was analyzed by VAS scale on the 1st, 3rd, 5th, and 7th prospective days of both groups, and data were recorded in MS Excel (2013) worksheet, the data were analyzed by SPSS 2.0 version.

The mean pain score on 1st prospective day was 3.8 ± 1.3 for group A while group B Was 7.5 ± 1.7. Therefore the pain relief was measured as significant in Group A (PRF) as compared to Group B (ZOE). On 3rd prospective day of the trial the mean pain score was group A was 2.9 ± 1.1 and group B was 4.7 ± 1.3.

On day 5th the mean agony mark of Group A was 1.1 ± 0.9 and Group B was 3.0 ± 1.0 and on the last 7th prospective day the mean score of "group A" was 1.0 ± 0.6 and "group B" was 1.8 ± 0.8. The study results observed significant pain relief on every prospective day by group A (PRF) as compared to Group B (ZOE) as shown in Table-III.

Variables	Frequency	Percentage
Gender		
Male	28	35%
Female	52	65%
Mean Age		
Male	38.5	
Female	34.25	
Habit of smoking		
Male		
Smoker male	19	68%
Nonsmoker male	9	32%
Female		
Smoker female	6	11%
Nonsmoker female	46	89%

Table-I. Demographical feature of Alveolar Osteitis (AO) patients

Pain Score	Day-1				Day-3				Day-5				Day-7			
	ZOE		PRF		ZOE		PRF		ZOE		PRF		Z0E		PRF	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0	0	0%	0	0%	0	0%	0	0%	0	0%	16	40%	1	2.5%	21	52.5%
1	0	0%	0	0%	0	0%	5	12.5%	15	37.5%	20	50%	13	32.5%	15	37.5%
2	0	0%	7	17.5%	2	5%	10	25%	11	27.5%	4	10%	18	45%	4	10%
3	0	0%	11	27.5%	6	15%	14	35%	14	35%	0	0%	8	20%	0	0%
4	0	0%	8	20%	9	22.5%	8	20%	6	15%	0	0%	0	0%	0	0%
5	3	7.5%	6	15%	13	32.5%	4	10%	4	10%	0	0%	0	0%	0	0%
6	8	20%	5	12.5%	5	12.5%	0	0%	0	0%	0	0%	0	0%	0	0%
7	9	22.5%	2	5%	4	10%	0	0%	0	0%	0	0%	0	0%	0	0%
8	7	17.5%	0	0%	1	2.5%	0	0%	0	0%	0	0%	0	0%	0	0%
9	11	27.5%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
10	2	5%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

Table-II. Frequency and percentage of pain score measured by VAS scale

Prospective Days	Zinc Oxide Eugenol Mean SD	Platelet Rich Fibrin Mean SD	P-Value
Day-1	7.5 ± 1.7	3.8.1 ± 1.3	<.02
Day-3	4.7 ± 1.3	2.9 ± 1.1	<.02
Day-5	3.0 ± 1.0	1.1 ± 0.9	<.02
Day-7	1.8 ± 0.8	1.0 ± 0.6	<.02

Table-III. Mean standard deviation of ZOE and PRF during prospective days

DISCUSSION

Alveolar osteitis, is a painful dental condition that can occur after a permanent tooth is extracted. A blood clot forms in the socket to protect the underlying bone and nerve endings after a tooth is extracted. However, if the blood clot is dislodged or dissolves too quickly, it can expose the bone and nerve endings, leading to a painful condition. Therefore the management of pain and healing is the main focus of dentists. The primary purpose of this learning was to assess ZOE and PRF and compare them to explore effective treatment.

The study enrolled a maximum 80 number of patients of both sex, 28 male and 52 female, study trial found a high ratio of female patients as compared to male patients. The average age of male patients was reported as 38.5 while female patients was 34.25. The study is also comparable with Hussain et al, which also reported a high ratio of females as compared to females.[12]

The present study also reported the habit of smoking in alveolar osteitis patients. Smoker male patients were reported 19 (68%) and nonsmokers 9 (32%), while female smokers were 6 (11%) and female nonsmokers were 46 (89%) as mentioned in Table-I, it was observed that smoker male ratio was high as compared to female. According to the study of H Abu Younis et al, the prevalence of dry sockets was found to increase in smoker male patients as compared to nonsmokers male.[13]

The study focus was on the PRF and ZOE compression in pain relief of alveolar osteitis, pain score of all AO patients was measured by the VAS scale on all prospective days. Therefore the study reported significant results (p=0.005) of platelet-rich fibrin in pain relief as compared to zinc oxide eugenol. PRF is reported as more effective in the healing of tissue and pain management in many studies. The results of the current study are also comparable with Reeshma et al (2021)[14], and Sam Paul et al (2019)[15] conducted study according to their study PRF is reported as effective in pain and wound healing as compare to ZOE.

CONCLUSION

The study reported that Platelet Rich Fibrin was more effective in pain relief management as compared to Zinc oxide eugenol in Alveolar osteitis patients.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Talha Javed	Study design, Patient selection, Data collection.	
2	Bushra Arain	Study design, questionnaire design and Literature search.	
3	Mowaffaq Abdullmomen Al Absi	Data analysis, suggestions, data interpretation.	
4	Zunair Akbar Memon	Review and proof reading.	
5	Hafiz Mahmood	Data collection drafting in literature search.	
6	Aswad Ahmed	Experimental work, patients selection and results interpretation