

Effect of Pomegranate Extract and Chlorhexidine Mouth Wash on Post-Operative Complications After Surgical Removal of Wisdom Teeth

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Abstract:

The purpose of this study is to evaluate the effectiveness of pomegranate mouth wash in comparison with chlorhexidine mouth wash on post-operative complications result from surgical removal of wisdom teeth.

Forty Iraqi patients who underwent surgical removal of impacted wisdom teeth were divided into two equal groups, patients in first group were instructed to use pomegranate mouth wash while those in the second group used chlorhexidine mouth wash. Post operative complications as pain, swelling, trismus and oozing were examined for both groups at second, fourth and seven days after operation. The data were statistically analyzes and compared between the groups.

A significant difference was shown between the two groups of pomegranate and chlorhexidine mouth wash according to each parameters (first = pain, second= swelling, third= trismus, forth= oozing) depends on the days of post-surgical assessment (second days, forth days and seven days).

In Conclusions the effectiveness of pomegranated mouth wash was better than chlorhexidine mouth wash on post operative complications following the surgical removal of third molars (wisdom).

Key words: *Pomegranates extract, chlorhexidine, mouthwash, wisdom,*

تأثير مستخلص قشور الرمان وغسول الفم كلورهكسدين على مضاعفات ما بعد العملية
النتيجة من إزالة سن العقل جراحياً

الخلاصة:

تم إجراء مقارنة بين فعالية مستخلص محلول قشور الرمان وشحمه وإستخدامه كغرغرة معقمة بعد إجراء عمليات رفع سن العقل جراحياً كبديل للمستحضرات الكيميائية كغرغرة (الكلور هكسدين) وذلك لتجنب الاعراض الجانبية للمستحضرات الكيميائية.

أجريت عمليات رفع سن العقل لـ 40 مريض تم تقسيمهم الى مجموعتين بالتساوي (20 مريض لكل مجموعة)، حيث ان المجموعة الاولى استخدمت مستخلص محلول قشور الرمان وشحمه والمجموعة الثانية استخدمت الكلور هكسدين كغرغرة بعد العملية وقد تم تقييم النتائج بين المجموعتين بالاعتماد على الملاحظات السريرية (الألم، الورم، تشنج عضلات الفك، نضوح الدم) خلال 2, 4 و 7 أيام بعد اجراء العملية وبالاعتماد على مشاهدات المريض نفسه، بعد إستحصال موافقة المريض على استخدام المحلولين.

أظهرت النتائج فعالية مستخلص محلول قشور وشحم الرمان كغرغرة بعد العملية فوق الكلور هكسدين من خلال النتائج السريرية التي حصل عليها.
الكلمات المفتاحية: مستخلص قشور الرمان، كلور هكسدين، غرغرة، سن العقل.

Introduction:

The surgical removal of impacted teeth particularly the 3rd molar (mandibular or maxillary wisdom tooth) is one of the most common surgical procedures that is facing the oral and maxillofacial surgeons [1]. Every surgical procedure is usually associated with postoperative complications typically manifesting as pain, edema, trismus, and sometimes minor bleeding (oozing of blood from the surgical site)^[2,3]. Chlorhexidine gluconate is broad spectrum bactericidal agent which play a significant role in many dental branches such as periodontics, endodontics, preventive dentistry, and oral surgery; this drug used in oral surgery to reduce the bacterial load and can be beneficial for surgical cases to reduce the risk of infection^[4, 5].

Chlorhexidine as chemical drugs may have several side effects such as increase in staining of teeth and other oral surfaces; increase in calculus formation; an alteration in taste perception; oral irritation and local allergy^[6]. However, many research and trials found other materials that have less side effect and more powerful activity mouth rinse than the chemical drugs. One of these materials is pomegranate extract where between 1950 and 1999 only 25 such publications appear on MedLine^[7,8]. In addition to its ancient historical uses, pomegranate is used in several systems of medicine for a variety of ailments. In Ayurvedic medicine the pomegranate is considered "a pharmacy unto itself" and is used as an antiparasitic agent, blood tonic, heal naphtha, diarrhea, and ulcers^[9,10,11].

The biochemical constituents of pomegranate extracts of all parts of the fruit appear to have therapeutic properties^[8], and some studies report the bark, roots, and leaves of the tree have medicinal benefit as

well^[9]. Current research seems to indicate the most therapeutically beneficial pomegranate constituents are ellagic acid, ellagitanins (including punicalagins), punicic acid, flavonoids, anthocyanidins, anthocyanins, and estrogenic flavonols and flavones^[8].

One of the most important properties of Pomegranate that has antibacterial and antiviral activity which make it a strong mouth wash to reduce infection^[12].

This study designed to gets the benefit of pomegranate extract as a mouth wash over the chemical drugs (chlorhexidine mouth wash) after surgical removal of 3rd molar depending on clinical parameters (pain, swelling, trismus, and oozing) between two groups (1st group pomegranate used mouth wash and 2nd group that use chlorhexidine mouth wash).

Materials and Methods:

Sample of this study composed of forty Iraqi patients attending the teaching hospital in the College of Dentistry, University of Al-Mustansiriyah for a surgical removal of impacted third molar (upper and lower) under local anesthesia. The age of patients ranges from (15-40 yrs). Detail medical, dental history, and a consent form were taken for each patient before performing the surgical procedure.

All selected patients did not received any medications (no history of systemic disease), they were all subjected for radiographical examination by using OPG (orthopantomograph), and/or PA (periapical) radiograph. The patient then divided into two equal groups, one use a pomegranate mouth wash and the other use chlorhexidine mouth wash.

The pomegranate mouth wash was prepared with concentration 1/1 W/V (1 g of

peel, rind, and leaves of pomegranate in 1ml of distilled water) were the mouth wash prepared by boiling one kilogram of peel, rind, and leaves of pomegranate in one liters of distill water in laboratory container for 10-15 minutes, after that; the extracts were filtered by special filter and the solution used in a concentration of 1 g as active ingredient in 1 ml of distilled water.

The used chlorhexidine mouthwash was with concentration 0.2%. The surgical procedure were carried out under local anesthesia (2% lidocaine with 1/80000 adrenalin) and the instruments (diagnostic and surgical) were good sterilized by hot air oven, three or two sided flab used for exploration of impacted teeth, surgical handpice used for removal of bone and sometimes for tooth sectioning, normal saline (0.9% sodium chloride) used for irrigation, the operation site sutured by 3/0 black silk suture with cutting end needle, and all the patients covered by suitable antibiotics and analgesics.

Pain, swelling, trismus and oozing were used as clinical parameters in the comparison between the two groups.

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These parameters were recorded by the patient themselves post-surgically after second, fourth and seventh days. These records were collected by prepared questionnaire forms (subjective criteria) depend on using yes or no answers.

All data are analyzed statistically by using descriptive and inferential statistic for comparing between the two groups.

Results:

The statistical comparison for the first clinical parameters (pain) between two groups, show that the percentage of the patients with (no) answers in the 1st group (55%, 100%, and 100%) while in the 2nd group (5%, 45%, and 90%) (Figure-1), and there was significant difference in the second and fourth days but there was no significant difference in the seventh days P-value = 0.048, 0.021, and 0.147 respectively (Table-2), while there was significant difference between two groups were P-value= 0.046, Chi-square=2.351 (Table-1), which indicate clearly that pomegranate mouth wash more efficient than chlorhexidine on minimize postoperative pain.

Table-1: General statistical evaluation between 1st & 2nd groups.

	Pain		Swelling		trismus		oozing	
	Chi-square	P-value	Chi-square	P-value	Chi-square	P-value	Chi-square	P-value
Group1 & Group2	2.351	0.046 S	2.003	0.049 S	2.265	0.046 S	1.00	0.317 NS

Table-2: General statistical evaluation between 1st & 2nd of number of signs.

	#	Pain			Swelling			trismus			Oozing		
		2d	4d	7d	2d	4d	7d	2d	4d	7d	2d	4d	7d
Group 1 & Group 2	Chi-square	2.174	3.147	1.023	1.224	3.625	0.00	4.268	2.047	2.625	2.314	0.00	0.00
	P-value	0.048S	0.021 S	0.147 NS	0.185 NS	0.038 S	1.00 NS	0.021 S	0.049 S	0.049 S	0.047 S	1.00 NS	1.00 NS

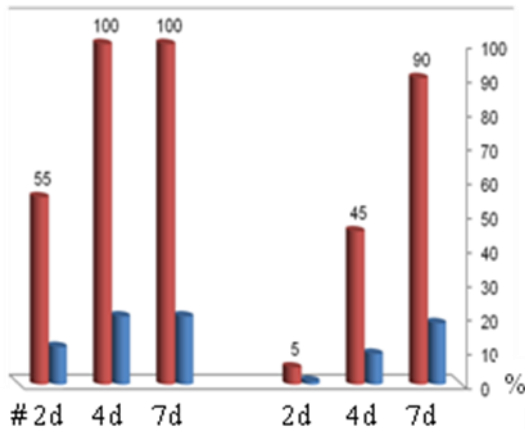


Figure-1: Percentage of (No) answer between 1st & 2nd groups in pain.

In the second clinical parameters (swelling), statistical outcome exhibit that the percentage of the patients with (no) answers in the 1st group (90%, 25%, and 100%) while in the 2nd group (45%, 15%, and 100%) (Figure-2) and there was a significant differences in the fourth days but there was no significant differences in the second and seventh days P-value = 0.038, 0.185, and 1.000 respectively (Table-2), while between two groups there was significant difference were P-value = 0.049 and Chi-square = 2.003 (Table-1). From this results pomegranate mouth wash has more effects than chlorhexidine on reducing swelling post surgically.

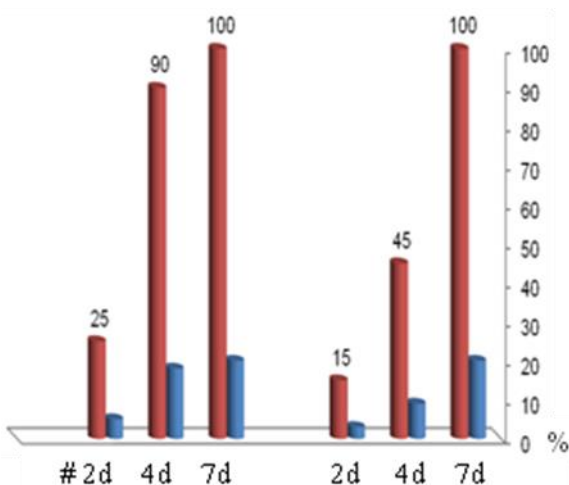


Figure-2: Percentage of (No) answer between 1st & 2nd groups in swelling.

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In the third clinical parameters (trismus), the percentage of the patients with (no) answers in the 1st group (75%, 100%, and 100%) while in the 2nd group (5%, 60%, and 85%) (Figure-3), and there was a significant differences in the second, fourth, and seven days were P-value = 0.021, 0.049, and 0.049 respectively (Table-2), also there was significant difference between two groups were P-value = 0,046 and Chi-square = 2.265 (Table-1), which indicate that pomegranate mouth wash minimize trismus more than chlorhxedien after surgical extractions.

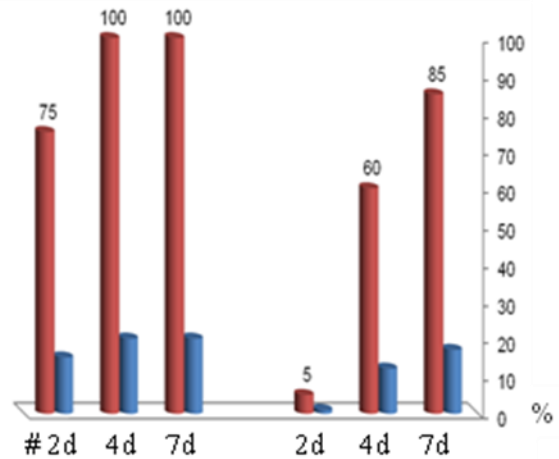


Figure-3: Percentage of (No) answer between 1st & 2nd groups in trismus.

In the last clinical parameters (oozing), the percentage were 95%, 100%, and 100% in the 1st group while 45%, 100%, and 100% in the 2nd group (Figure-4), and there was significant differences in the second days but there is no significant differences in the fourth and seventh days P-value=0.047, 1.000, and 1.000 respectively (Table-2), also there was no significant difference between two groups P- value = 0.317 and Chi-square =1.00. (Table-1), which show that pomegranate and chlorhxedien mouth wash have the same effects on the fourth parameters (oozing).

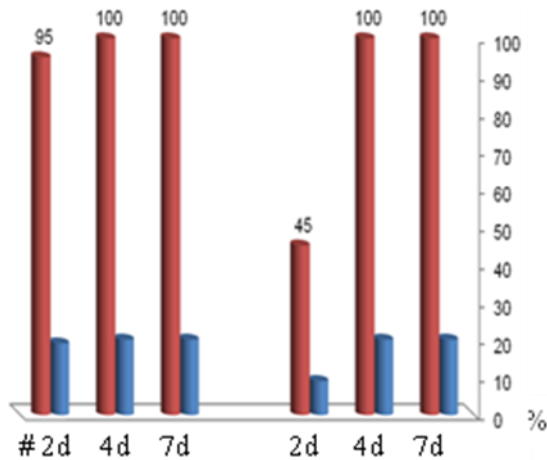


Figure-4: Percentage of (No) answer between 1st & 2nd groups in oozing.

Discussion:

The phytochemistry and pharmacological actions of all *Punica granatum* components suggest a wide range of clinical applications for the treatment and prevention of cancer, as well as other diseases where chronic inflammation^[7].

The result of this study predicted successful applying of pomegranate extract as mouth wash, the reducing in side effect could be attributed to avoid any chemical hazard materials that could effect on oral cavity. All results show positive response to treatment similar to those obtains from chlorhexidine. This activity in application could be related to activity of pomegranate against microorganism, this activity was recorded by kathi keville, et al. ^[12].

The pomegranate show excellent activity as anti inflammation and fast recovery, these results comply with Caceres A, et al.^[11] who found that pomegranate extracts has an anti-inflammatory effects.

The statistical evaluation represents significant improvement in activity, these activities were observed as reducing pain, swelling, trismus, and more acceptances for applying by patient because of its nice test, this result were show similarity to those obtain from other researcher in examination

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of treatment response Jurenka JS^[8] and kathi keville, et al.^[12].

Also Saad Sabbar Dahham, et al.^[13] found that a pomegranate extract have many antibacterial and antifungal activity and Archana Devi, et al.^[14] Said pomegranate has powerful antibacterial activity against many types of bacteria and this respectively reduced infections (with well minimized post-surgical pain-swelling–trismus and oozing).

Other study by Abdollahzadeh Sh., et al.^[15] noted that a pomegranate extract have antibacterial and antifungal activities against oral pathogens.

Conclusion:

In conclusion, the pomegranate mouth wash extract was found to be very effective as mouth wash treatment, its safety, activity and validity provided promising successful application of this extract in dentistry application. The plant nature of extract protect patient from any side effect of chemical substance.

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