Topical Imiquimod 5% Cream Versus Salicylic acid 30% Cream in Treating Common Warts: A comparative study

Dilpak N. Muhammed-Ameen, **Alan D. Meran**
Department of Medicine, College of Medicine, Hawler Medical University, Erbil, Iraq.
Corresponding author: dilpaknajimadden@gmail.com

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ABSTRACT:

Background: Warts are considered the foremost common infectious diseases affecting the epidermal keratinocytes, the causative agent is the human papilloma virus (HPV). Diagnosis usually can be confirmed depending on both the clinical features and family history. Although these viruses create no acute signs or symptoms, they induce slow growth of lesions that can remain for a long period.
Aim: This study aims to assess the efficacy of topical imiquimod 5% cream in treating cutaneous warts and compare it with the effects of salicylic acid on cutaneous warts.
Method: In this study a total of 68 patients were allocated randomly into two groups; one group treated with Imiquimod cream 5% (n=35) and the other group treated with salicylic acid 30% cream (n=33) to evaluate the difference between these two groups. The response to treatment is evaluated through pictures of the lesions taken before, during, and after treatment.
Conclusion: Both topical imiquimod 5% cream and salicylic acid 30% cream can be used safely for the treatment of common warts. Topical salicylic acid cream 30% may show better efficacy but also has more risk of irritation.

Keywords: human papillomavirus, viral warts, imiquimod cream, salicylic acid, efficacy.

كريم موضعي 5% ايمكويميود مقابل 30% حامض السلسليك لعلاج الثالول الشائعة: دراسة مقارنة

الخلاصة
المدخل: يعتبر الثالول من أهم الامراض المعدية التي تصيب الخلايا الكيراتينية في البشرة، والعامل المسبب هو فيروس الورم الحليمي البشري **(**HPV**).** يمكن تاكيد التشخيص عادة اعتمادا على كل من السمات السريرية والتاريخ العائلي. على الرغم من أن هذة الفيروسات لا تسبب أي علامات أو أعراض حادة، الا انها تحفز النو البطئ للآفات التي لا يمكن أن تبقى لفترة طويلة.
الهدف: تهدف هذه الدراسة الى تقيم فعالية كريم ايمكويميود لعلاج الثالول بالمقارنة مع السالسك اسد
طرق العمل: في هذة الدراسة تم تقسيم 68 مريضا بشكل عشوائي الى مجموعتين. المجموعه الاولى عولجت (35 ن) ب كريم 5% ايمكويميود، والمجموعه الثانية عولجت (33 ن) ب 30% كريم حامض السلسليك ليتم تقيم الفرق بين هاتين المجموعتين. يتم تقيم الاستجابة للعلاج من خلال صور الافات التي تم التقاطها قبل واثناء وبعد العلاج.
الملخص: يمكن استخدام كلا من كريم 5% ايمكويميود الموضعي وكريم حامض السلسليك 30% لعلاج الثالول الشائعة، قد يظهر كريم 30%حامض السلسليك الموضعي فعالية أفضل ولكنه ايضا أكثر عرضه للتهيج.

الكلمات المفتاحية: فيروس الورم الحليمي البشري، الثالول الفيروسي، كريم ايمكويميود، حامض السلسليك، الفعالية.

INTRODUCTION:

Warts (verrucae) are considered the foremost common infectious diseases affecting the epidermal keratinocytes, the causative agent is the human papilloma virus (HPV)[1]. The prevalence of (HPV) infection is increasing continuously globally[2]. Whereas a majority of infections are symptomless or self-limited, acquisition of specific forms of HPV can lead to a remarkable economic burden[3]. Common warts (other than plantar warts) are caused primarily by HPV-2, but also to the closely related types 27, 57, and types 1 and 4 [1]. More or fewer warts in children heal within 2 years[4,] but in a minority of otherwise well individuals, warts can spread and persist to a duration of 4 years[5]. Until now there is no specific antiviral therapy available to clear HPV infection. Available modalities are directed toward the destruction or removal of visible lesions or induction of cytotoxicity against infected cells[6]. The most commonly used treatments for warts involve the destruction of the area of the epidermis infected with the virus. Such treatments usually initially involve the application of a topical preparation. Other therapies aimed at modifying the growth of the epidermis or stimulating an immune response require either a topical or a systemic approach[1]. Destructive methods could be chemical or physical methods[7]. The keratolytic effect of salicylic acid helps to decrease the bulk of warts and may stimulate an inflammatory response, regarded as a chemical destructive method. A preparation containing 12–26% salicylic acid, possibly with additional lactic acid, in a quick-drying collodion or acrylate base, is the first treatment of choice for common and plantar warts[1].

Imiquimod 5% cream is FDA approved for the treatment of genital warts, superficial basal cell carcinoma, and actinic keratoses. Cutaneous warts have also responded to imiquimod treatment [8]. The addition of occlusion has been shown not to affect clearance rate[9]. Butchers' warts, facial filiform warts, and plane warts may all respond and immunosuppression does not interfere with the therapeutic effect. The side effects might be mild irritation, discomfort, and occasionally erosion at the point of application with a small risk of causing vitiligo-like depigmentation[1].

Lastly, complementary and alternatives, including psychological and herbal treatments have also been used with different efficacies[10].

The study focused on the efficacy of topical imiquimod 5% cream in treating cutaneous warts and comparing it with the effects of salicylic acid, in patients visiting the dermatology teaching center complaining of cutaneous warts.

METHOD:

A comparative interventional study has been done over 6 months. Cases presenting with warts were recruited from patients attending the Erbil Dermatology Teaching Center (EDTC). Patients were evaluated through a questionnaire sheet prepared by the investigators, all demographic data and medical history including any previous and current medications used by patients will be taken from them. All participants should sign a statement of informed consent, and patients and their families will be given all information about the drugs that are going to be used including any side effects that they may cause. In addition, pictures of the lesions were taken before, during, and after treatment.

The study population included nearly 70 cases with warts attending EDTC, they were divided into 2 groups. The first one will receive imiquimod and the other received the salicylic acid (SA) group.

Regarding imiquimod, patients or their parents are directed to wash the treatment area using mild soap and water, then open the sachet and apply a thin layer of the

cream and rub it until it all disappears, to enhance its absorption. Wash the hands again. The treatment should stay in place for 4 hours then wash it off. The opened sachet is for single use only and should be disposed of properly. These steps are repeated every other day for 4 weeks duration.

Regarding the salicylic acid (SA) 30% preparation cream the same instructions should be used except for the time, the SA should stay overnight and was kept under occlusion.

During treatment, if any complications are noticed by the patient or investigators, the treatment will be stopped for a few days and restarted when the complications are cured.

*** Information sheet:** (as shown in Appendix II)

*** Consent Form:** (as shown in Appendix III)

RESULTS:

The total sample includes 68 patients that are further divided into 2 treatment groups; the first group treated with Imiquimod involves 35 patients while the second group treated with Salicylic acid consists of 33 patients.

Table (1) demonstrates the statistical characteristics of the age among both study groups and shows that both the Salicylic acid group and Imiquimod group have nearly the same age means, which is statistically non-significant (p=0.171).

Ethical consideration

Table (1): The statistical characteristics of the age among both study groups

Statistical characteristics of the age		Imiquimod	Salicylic acid	p-value
Mean		21.07±10.32	19.24±14.85	0.556*
Median		15.00	15.00	0.171**
Range		38.50	52.00	
Minimum		11.50	3.00	
Maximum		50.00	55.00	
Percentiles	25	13.00	6.00	
	50	15.00	15.00	
	75	28.00	29.50	

*t-test for independent two means, **Mann-Whitney U test

Table (2) demonstrates the comparison of socio-demographic characteristics between the study groups and reveals that the female gender is more frequent in both groups than the males representing 65.7% of the Regarding the occupation, no child was found in the Imiquimod group but

Imiquimod group and 54.5% of the Salicylic acid group; the difference in gender between the groups is statistically non-significant (p=0.171).

represents 12.1% of the Salicylic acid group. Students represent 60.0% and 45.5%

of the Imiquimod and Salicylic acid groups respectively. The housewife was found in 25.7% of the Imiquimod group and in 24.2% of the Salicylic acid group. Governorate employee and Private employee 8.6% and 5.7% of Imiquimod group and 3.0% and 15.2% of Salicylic acid group respectively, the difference is statistically non-significant between the two study groups.

Most of the patients 77.1% of the Imiquimod group and 87.9% of the Salicylic acid are living in an urban area in comparison to 22.9% and 12.1% in that order living in rural, the difference is statistically non-significant (p=0.246).

Table (2): The comparison of socio-demographic characteristics between the study groups.

Socio-demographic characteristics		Imiquimod n=35 No. (%)	Salicylic acid n=33 No. (%)	p-value
Gender	Male	12(34.3%)	15(45.5%)	0.347*
	Female	23(65.7%)	18(54.5%)	
Occupations	Child	0(0.0%)	4(12.1%)	**0.05****
	Student	21(60.0%)	15(45.5%)	0.230*
	Housewife	9(25.75%)	8(24.2%)	0.889*
	Governorate employee	3(8.5%)	1(3.0%)	0.614**
	Private employee	2(5.75%)	5(15.2%)	0.252**
Residence	Urban	27(77.1%)	29(87.9%)	0.246*
	Rural	8(22.9%)	4(12.1%)	

*Chi-square test, **Fissure exact test

Table (3) shows the comparison between the study groups and demonstrates that 85.7% of the Imiquimod group and 93.9% of the Salicylic acid group are presenting for the first time while the recurrence has occurred among 14.3% and 6.1% of Imiquimod and Salicylic acid groups respectively, with a statistically non-significant difference (p=0.429). Among the patients with recurrent warts, 60.0% of the Imiquimod group and 100.0% of the Salicylic acid group has recurred once, with a non-significant difference between the study groups regarding the no. of recurrence. Furthermore, no significant difference was found between the study's groups concerning the previous treatment (p=0.309). Among those who have received previous treatment in the Imiquimod group, 29.4% received it at home, 52.9% at the clinic, and 17.7% in both. While in the Salicylic acid group, half of the patients received the treatment at home, the differences are non-significant. Most of the patients received topical treatment in 58.8% and 75.0% of Imiquimod and Salicylic acid groups respectively, the differences are statistically non-significant in all types of previous treatment.

Table (3): The comparison between the study groups.

		Imiquimod n=35 No. (%)	Salicylic acid n=33 No. (%)	p-value
Episode	First	30(85.7%)	31(93.9%)	0.429**
	Recurrent	5(14.3%)	2(6.1%)	
No. of recurrence		n=5	n=2	
One		3(60.0%)	2(100.0%)	1.000**
More		2(40.0%)	0(0.0%)	
Previous treatment		n=35	n=33	
Yes		17(48.8%)	12(36.4%)	0.309*
No		18(51.2%)	21(63.6%)	
Place of previous treatment		n=17	n=12	
Home		5(29.4%)	6(50.0%)	0.438**
Clinic		9(52.9%)	6(50.0%)	0.876*
Both		3(17.7%)	0(0.0%)	0.246**
Types of previous treatment		n=17	n=12	
Topical		10(58.8%)	9(75.0%)	0.449**
Home remedy		3(17.7%)	3(25.0%)	0.669**
Cautery		1(5.8%)	0(0.0%)	1.000**
Cryotherapy		3(17.7%)	0(0.0%)	0.246**

*Chi-square test, **Fissure exact test

Table (4) shows the statistical characteristics of wart duration in the study groups and reveals that the duration among the Salicylic acid group is shorter than in the Imiquimod group but the difference is statistically non-significant (p=0.348).

Table (4): The statistical characteristics of wart duration in the study groups.

Duration		Imiquimod	Salicylic acid	p-value
Mean		11.43±15.14	8.27±8.42	0.296*
Median		6.00	4.00	0.384**
Range		59.00	23.00	
Minimum		1.00	1.00	
Maximum		60.00	24.00	
Percentiles	25	3.00	2.00	
	50	6.00	4.00	
	75	12.00	12.00	

*t-test for independent two means, **Mann-Whitney U test

Figure (1) demonstrates the comparison of clinical characteristics of Wart between the study groups and depicts that the hand is the most frequent site in both study groups representing 65.7% of the Imiquimod group and 63.6% of the Salicylic acid group, the next site is dorsum of the foot 20.0% and 33.4% of Imiquimod and Salicylic acid groups respectively, the statistical differences of the different sites is non-significant between the study groups.

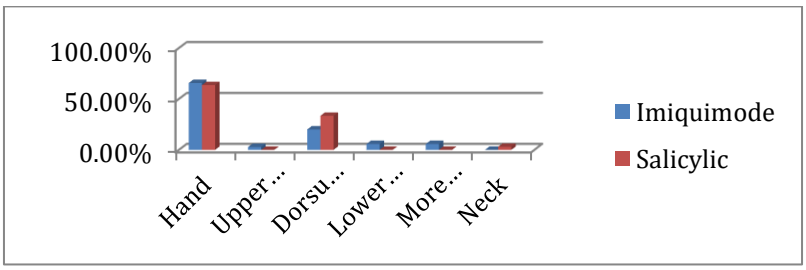

Figure (1): the clinical characteristics of warts in the study groups.

Table (5) demonstrates the comparison of the other clinical characteristics of warts between the study groups and depicts that among the Imiquimod group, 65.7% have 1-5 Warts and 17.15% have 6-10 Warts while among the Salicylic acid group 84.8% have 1-5 Warts and 15.2% have 6-10 Warts; the differences are statistically non-significant. The remaining 17.15% of the Imiquimod group have no. of Warts more than 10, which is statistically different from the Salicylic acid group (p=0.025).

Clinically, 62.9% of the Imiquimod group and 63.6% of the Salicylic acid group are asymptomatic which is statistically non-significant (p=0.947), as well as, all the presenting symptoms show no significant difference between the study groups.

Table (5): The comparison of clinical characteristics of Wart between the study groups.

Clinical characteristics of Wart		Imiquimod n=35 No. (%)	Salicylic acid n=33 No. (%)	p-value
No. of wart	1-5	23(65.7%)	28(84.8%)	0.069*
	6-10	6(17.15%)	5(15.2%)	0.824*
	More than 10	6(17.15%)	0(0.0%)	**0.025****
Associated signs	Asymptomatic	22(62.9%)	21(63.6%)	0.947*
	Bleeding	5(15.2%)	2(6.1%)	1.000**
	Itching	3(8.5%)	5(15.15%)	0.471**
	Pain	8(22.9%)	5(15.15%)	0.419*

*Chi-square test, **Fissure exact test

Table (6) shows the comparison of treatment between the study groups and demonstrates that no complete reduction in the number of warts occurs among the Imiquimod group while the complete reduction in the number of warts, among the Salicylic acid group, represents 18.15%, this difference is statistically significant at (p=0.01). No response and poor response are higher in the Imiquimod group than in the Salicylic acid group meanwhile good response is higher in the Salicylic acid group than in the Imiquimod group with statistically no significant differences.

The difference between the study groups is significant regarding no reduction in the wart size (0.012) while the 50% reduction in the wart size, shows a non-significant difference (p=0.471). The total disappearance of the wart size was found in 18.15% among the Salicylic acid group but not in the Imiquimod group with a statistical difference of (p=0.01).
Although the adverse events among the Imiquimod group (34.3%) are lower than that of the Salicylic acid group (57.6%) but statistically non-significant (p=0.054).

Pain and redness show no statistical differences between the study groups while the irritation among the imiquimod group (41.7%) is lower than that of the Salicylic acid group (73.7%) in a statistically significant way (p=0.01).

Table (6): The comparison of treatment between the study groups.

Treatment		Imiquimod n=35 No. (%)	Salicylic n=33 No. (%)	p-value
Responses	Complete reduction 100%	0(0.0%)	6(18.15%)	**0.01****
	No response < 25%	14(40.0%)	11(33.4%)	0.569*

	Poor response 25-50%	17(48.6%)	10(30.3%)	0.124*
	Good response 50-75%	4(11.4%)	6(18.15%)	0.507*
Reduction	No reduction	32(91.5%)	22(66.7%)	**0.012***
	50% Reduction	3(8.5%)	5(15.2%)	0.471**
	Totally disappear	0(0.0%)	6(18.15%)	**0.01****
Presence of adverse events of treatment	Yes	12(34.3%)	19(57.6%)	0.054*
	No	23(65.7%)	14(42.4%)	
Types of the adverse event of treatment		n=12	n=19	
Irritation		5(41.7%)	14(73.7%)	**0.01***
Pain		2(16.6%)	1(5.3%)	1.000**
Redness		5(41.7%)	4(21.0%)	1.000**

*Chi-square test, **Fissure exact test

Table (7) demonstrates the relation between wart characteristics like wart duration, sites, and number and the response to imiquimod 5% cream. This shows that 50% had no response in those who had a wart for less than 6 months duration.no patients had a reduction by half of those who had warts for more than 12 months duration with no statistical significance difference (p=1). Regarding the site of the warts, 62.5% of those who had warts on their hands had no reduction while 100 % of them had a reduction by half. Which is also statistically insignificant (p=0.729). Furthermore, the association between size reduction and the number of warts showed that 65.6 % of patients who had (1-5) warts developed no reduction while none of the patients who had more than 10 warts had a reduction by half which is also insignificant statistically (p=1). Moreover, no total disappearance was detected in any of the groups.

Table (7): Relation of wart number reduction with wart characteristics in the imiquimod group.

The outcome of treatment no. reduction for Imiquimod group		No reduction	Reduction by half	Disappear	p-value*
Wart duration (months)	< 6 months	16(50.0)	2(66.7)	0	1.000
	6 to 12 months	12(37.5)	1(33.3)	0	
	>12 months	4(12.5)	0(0.0)	0	
Sites	Neck	0(0.0)	0(0.0)	0	0.729
	Upper extremity	1(3.1)	0(0.0)	0	
	Hand	20(62.5)	3(100.0)	0	

	Low extremity	2(6.3)	0(0.0)	0	
	Dorsum of foot	7(21.8)	0(0.0)	0	
	>one area	2(6.3)	0(0.0)	0	
No. of warts	1-5	21(65.6)	2(66.7)	0	1.000
	6-10	5(15.6)	1(33.3)	0	
	>10	6(18.8)	0(0.0)	0	

*Freeman-Halton exact test

Table (8) demonstrates the relation of wart number reduction with wart characteristics including duration, sites, and number among the salicylic acid group. It shows an insignificant statistical association between wart duration and wart number reduction (p=0.154). Although 66.7% have disappearance in those who had a wart for < 6 months and only 33.3% in those who had a wart for >12 months duration. Concerning the sites, displays a statistically insignificant difference (p=0.865), in which 50% of patients having warts on each hand and dorsum of the foot have a total disappearance in their warts. While, none of the other sites including the neck, upper extremity, lower extremity, and more than one area developed a total disappearance in their warts. Regarding the number of warts those who have 1 to 5 warts 86.45 of them had no reduction while 83.3% of them had a total reduction. Moreover, the patients who had more than 10 warts had no reduction in their wart number, which showed no statistically significant difference (p=1).

Table (8) Relation of wart number reduction with wart characteristics in the salicylic acid group.

Outcome of treatment no. reduction for Salicylic acid group		No reduction	Reduction by half	Totally disappear	p-value*
Wart duration (months)	< 6 months	14(63.7)	1(20.0)	4(66.7)	0.154
	6 to 12 months	5(22.7)	3(60.0)	0(0.0)	
	>12 months	3(13.6)	1(20.0)	2(33.3)	
Sites	Neck	1(4.6)	0(0.0)	00(0.0)	0.528
	Upper extremity	0(0.0)	0(0.0)	0(0.0)	
	Hand	16(72.7)	2(40.0)	3(50.0)	
	Low extremity	0(0.0)	0(0.0)	0(0.0)	
	Dorsum of foot	5(22.7)	3(60.0)	3(50.0)	
	>one area	0(0.0)	00(0.0)	0(0.0)	
No. of warts	1-5	19(86.4)	4(80.0)	5(83.3)	1.000
	6-10	3(13.6)	1(20.0)	1(16.7)	
	>10	0(0.0)	0(0.0)	0(0.0)	

*Freeman-Halton exact test

DISCUSSION:

Cutaneous warts are common skin lesions caused by human papillomavirus infection. Treatment is aimed at relieving the patient's physical and psychological discomfort and at preventing the spread of infection by autoinoculation. Among the available medical and destructive therapeutic options for cutaneous warts, none is uniformly effective or virucidal. Moreover, in most cases, their safety and efficacy have not been assessed [11].

A lot of researches and medical sources related to the treatment of warts were reviewed, and we could not find a study comparable to the current study in comparing the use of Imiquimod cream and salicylic acid in two groups of patients.

Our study involved 83 patients with common wart (but 15 patients were missed because they didn't come back for follow-up) allocated randomly into two groups; one group treated with Imiquimod cream 5% (n=35) and the other group treated with salicylic acid cream 30%(n=33) to evaluate the difference between these two groups.

Compared with other studies, an open trial was conducted by Micali *et al.* (2003), among 15 patients with warts. They assessed that the efficacy, safety, and tolerability of topical imiquimod 5% cream were found obvious in a sample size of only 15 patients[12]. They have worked on a sample size that is half of our study sample size (n=35). On the other hand, Grussendorf-Conen *et al*. (2002) conducted a study to evaluate the efficacy and safety of long-term treatment with imiquimod 5% cream applied to long-lasting (mean duration 6.3 years) common warts, which had been resistant to previous therapeutic interventions among 37 patients [13] same as the population number of our study.

While Bruggink *et al*., (2010) enrolled 250 patients in a randomized controlled trial. They randomly allocated 91 patients to each of the three groups: cryotherapy with liquid nitrogen every two weeks, self-application of salicylic acid daily, or a wait-and-see approach [14]. They used salicylic acid for a larger number of patients than our study sample size(n=33).

Regarding age, gender, and residence in our study no statistically significant difference was found between the two groups although those who lived in urban were more frequently involved in the study and this might be due to the easy accessibility of treatment, more available treatment facilities, more educated and more awareness and seeking for newer reliable treatments in the urban area.

The occupation showed no significant difference between the treatment groups of our study except for the child, it was found that no child has been treated with imiquimod cream because its safety and efficacy are not established before the age of 12 years by the United States Food and Drug Administration (FDA) agency, versus 12.1% treated with salicylic acid that showed statistical significance (p=0.05).

On contrary, Grussendorf-Conen *et al.*, (2002) found out that the topical application of imiquimod 5% cream is an effective treatment for long-lasting cutaneous warts in children [13]. While Cockayne *et al.*, (2011) conducted a multicenter, open, two-armed randomized controlled trial that enrolled patients with a verruca suitable for treatment with both salicylic acid and cryotherapy, and were aged 12 years and over [15]. This is different from our study age group which enrolled even children less than 12 years in the salicylic acid group. Similar to our study, Bruggink *et al.*, (2010), enrolled patients from age 4 years to 79 in their randomized controlled trial [14].

In our work, both comparison groups of topical imiquimod 5% cream and Salicylic Acid 30% cream used the medications for four weeks duration. Similar to this study regarding the duration of the treatment with

the imiquimod group, Muzio *et al*, reported 10 cases of recurrent common warts, with 8/10 patients showing total remission after application of imiquimod under occlusion once daily for 4 weeks, with no recurrences reported at 3-month follow-up [16].

On the other hand, a study was done by Grussendorf-Conen *et al.,* (2002) investigated and assessed the response and occurrence of side-effects of imiquimod 5% cream which was performed every 4 weeks until clinical cure or up to a maximum of 24 weeks [13]. They used the treatment for a longer duration than our study.

While another study was conducted by Bruggink *et al.,* (2010). They used Salicylic Acid cream as self-application daily; the nurses assessed outcomes during home visits at 4, 13, and 26 weeks and showed a cure rate of, 24% in the salicylic acid group [14]. In which the treatment is used for a much longer duration than in our study.

Regarding the response to treatment in our study, the complete reduction of warts was found in 18.15% of patients in the salicylic acid group while no patients had a complete reduction in the Imiquimod cream group with a statistically significant difference (p=0.01). That might be due to the short duration of the imiquimod use as it is an expensive new immune-modulatory medication and the thick keratotic nature of common warts.

Ahn *et al.,* (2014), disagreed with our study finding out that in immune-competent patients enrolled in non-controlled studies, the combined rate of patients achieving a complete response to therapy was 44 %, ranging from 27 to 89 %. However, in immune-suppressed patients, two studies and four case reports were identified. Clinical improvement was seen in 33–50 % of patients, with no patients experiencing complete clinical clearance [17].

In addition, Berman *et al.,* (2002) stated that fifty patients with common warts were treated with imiquimod once daily for 5 consecutive days over 12 weeks; 30% showed complete clearance and 26% showed a reduction in wart size greater than 50% [16].

Bruggink *et al.,* (2010) showed a similar result to our study (18.15%) regarding the response to treatment in the Salicylic Acid group with a cure rate of 15% [14].

The outcomes of Niazi *et al.,* (2018) in another hand, disagreed with our study regarding the efficacy of Salicylic Acid treatment (18.15%). In his study-results efficacy was achieved in 65 (61.9%) patients of group B (15% salicylic acid) as compared to 48 (45.7%) patients in group A (20 % zinc oxide paste), which was statistically significant ($p< 0.05$) [18].

Also, Cockayne *et al.,* (2011) showed a near similar result by finding out that there was no evidence of a difference in clearance rates between the treatment groups in the primary outcome [(14.3%) in the salicylic acid group vs cryotherapy group; $p = 0.89$] [15].

On another hand, Gibbs et al., (2006), conducted a review that found that thirteen trials assessed topical salicylic acid. Various preparations were used, with salicylic acid ranging from 15% to 60%; only one trial used 60% salicylic acid, most using standard preparations between 15% and 26% with or without lactic acid. The data pooled from six placebo-controlled trials showed a cure rate of 75% in cases compared with 48% in controls[19,] which showed a higher cure rate compared to our study.

In our work, the irritation only appeared significant between the treatment groups as a side effect that occurred in 41.7% of patients within the Imiquimod cream group and in 73.7% of patients treated with salicylic acid cream.In our work, the

relation between the characteristics of warts including duration, size, and number of warts, and the effect of both imiquimod cream and salicylic acid on decreasing the number of warts was also studied but showed no statistically significant difference (p=1) in both groups. This might be due to the limited duration of the study. Although 50% had no response in those who had a wart for less than 6 months duration.no patients had a reduction by half of those who had warts for more than 12 months duration in the imiquimod group. While 66.7% have totally disappearance in those who had a wart for < 6 months and only 33.3% in those who had a wart for >12 months duration in the salicylic acid group.

CONCLUSION:

From the results of our study, we can conclude that both topical treatment modalities imiquimod 5% cream and salicylic acid 30% cream can be used safely for the treatment of common warts. Topical salicylic acid cream 30% may show efficacy in a shorter duration of time but also has more risk of irritation.

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Appendix I

Questionnaire

Topical Imiquimod 5% Cream Versus Salicylic acid 30% Cream In Treating Common Warts: A comparative study

Code:
Name: Age: Tel.no.:
Gender: 1. Male Occupation: 1. Child Residency:1. Rural
2.Female 2. Student 2.Urban
3.Housewife
4.Governorate employee
5.Private employee
6.Retired
First visit:1. Yes 2.No Follow up:
First episode:1.Yes 2.No Recurrent episode:
No. of recurrent episode:0.None 2.One 3.More
Previous treatment:
1. Home: 2. Clinic: 3. Both:
Type of the previous treatment: 1. Topical: 2. Cryotherapy:
3. Cautery: 4. Laser: 5. Home remedy:
Duration of the wart: (in months)

Type of the wart:
Site of the wart: 1. Scalp 2.Neck 3. Ant. trunk 4. Post. trunk
5. Up. extremity 6.Hand 7.Low. extrimity
8. Dorsum of foot 9.More than one area
No. of warts: 1. (1-5) 2.(6-10) 3.> 10
Associated signs and symptoms:
0. Asymptomatic 1. Pain: 2. Itching: 3. Redness:
4. Bleeding: 5. Discharge:
Outcome of treatment:(responses)
I. Reduction in the mass size:
0. No response(<25%) 1. Poor response(25-50%)
2. Good response(50-75%) 3. Complete Reduction(100%)
II. Reduction in the no.of the lesions:
0.No reduction
1. Reduction by ½ 2. Totally disappeared
Adverse event of treatment:

	0.(No)	1.(yes)
1.Redness		
2.Irritation		
3.Pain		
4.Secondary bacterial infection		

Appendix II

Information sheet

I am Dilpak Najimadden MuhammedAmeen Senior House Officer (SHO) of Dermatology. I have research on the efficacy of topical imiquimod 5% cream and salicylic acid cream 30% in the treatment of common warts in Erbil Dermatology Teaching Centre. I shall provide this drug for free for you

Appendix III

Consent form

By signing below, you are agreeing that: (1) you have read and understood the participant information sheet, (2) questions about your participation in this study have been answered satisfactorily, and (3) you are aware of the potential risks (if any), and (4) you are taking part in this research study voluntarily.

Participant's Name	Name of the person obtaining consent
Participant's signature	Signature of the person obtaining consent
Date	Date