

## Efficacy of *Myrtus communis* L. and *Descurainia sophia* L. Versus Salicylic Acid for Wart Treatment

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**Background:** Wart is a skin disease with circular appendages, which is called "suloul" in Iranian traditional medicine (ITM). According to ITM literature, warts have different types and causes. The most important mechanism is excretion of materials (Khelt) from body to skin and mucus; its causative material is often phlegm, black bile or a combination of them. To treat warts, it is necessary to consider the patient's life style, modify his dietary intake and moisturize his temperament.

**Objectives:** This study aimed to compare *Myrtus communis* L. and *Descurainia sophia* L. as a method of ITM, versus salicylic acid in treatment of wart.

**Patients and Methods:** In this study, conducted in Yazd, Iran, 100 patients were selected and randomly divided into four groups. Group 1) salicylic acid, group 2) salicylic acid and *D. sophia* L. group 3) *M. communis* L. group 4) *M. communis* L. and *D. sophia* L. Numbers, sizes of lesions and symptoms, on days 0, 20, 40 and 90 were examined and analyzed. The relapse rate was investigated three months after. Changes of sizes and numbers of warts in each period of time in each group, compared to baseline, were assessed by Wilcoxon Signed Rank test. To compare these changes between the groups, Kruskal Wallis test was used.

**Results:** In this study 100 patients participated, 69% of which were female. Compared to baseline, mean  $\pm$  SD of changes for the number of warts in day 40 were  $1.12 \pm 4.2$ ,  $0.96 \pm 2.5$ ,  $1.32 \pm 5.1$  and  $0.04 \pm 0.2$  respectively in the four groups ( $P = 0.02$ ). Mean  $\pm$  SD of changes for the number of warts in day 90 were  $1.84 \pm 4.5$ ,  $1.56 \pm 2.8$ ,  $1.24 \pm 5.1$  and  $0.04 \pm 0.6$  respectively in the four groups ( $P = 0.03$ ). In addition mean  $\pm$  SD of changes for the size of warts in day 40 were  $0.96 \pm 1.8$ ,  $1.03 \pm 2.4$ ,  $2.47 \pm 3.0$  and  $0.45 \pm 1.7$  respectively in the four groups ( $P < 0.001$ ). Mean  $\pm$  SD of changes for the size of warts in day 90 were  $1.24 \pm 2.1$ ,  $1.3 \pm 2.3$ ,  $2.45 \pm 3.1$  and  $0.45 \pm 1.7$  respectively in the four groups ( $P < 0.001$ ). Relapse was not seen in any groups after three months. The frequency of side effects was similar after three months.

**Conclusions:** *M. communis* L. can be used as a topical treatment for warts. It not only shows more rapid response than salicylic acid, but also has fewer side effects. It seems that *D. sophia* L. can modify the digestion process and patients can excrete large amounts of the substance that causes warts. Therefore, it is better to use it more than 40 days. According to our investigation, in ITM, considering the cause and mechanism of disease generation and the causing materials of the disease, different treatments should be applied for each patient. Although applying an appropriate treatment is necessary, a unique treatment for all the patients cannot be available.

**Keywords:** Suloul; Wart; Iranian Traditional Medicine; Classical Medicine; *Myrtus communis* L.; *Descurainia sophia* L.; Salicylic Acid

### 1. Background

Wart is a contagious dermal disease with different types. Common warts are usually exophytic, multiple, irregular, rough nodules which show a variety of clinical patterns at different sites of trauma, particularly on fingers, as well as on abraded skin surfaces (1-3). Wart has long-term treatment with symptoms of multiple relapses which involve larger surfaces. It has no definite medical

treatment in classical medicine and the provided treatments encounter restrictions and side effects especially regarding facial warts (1, 4-9). Although there are not any surveys to show the prevalence of warts in Yazd province, Iran, based on our personal observations, there are many patients with warts in this province.

Dermal diseases are important in Iranian traditional

medicine (ITM). The name of wart in ITM is "Suloul". There are different types and causes for Suloul. The causes are Sauda, Balam or both. ITM is based on the principle of humeral balance. The principle states that each individual has a different humeral constitution, built from the four basic humors (akhlal): Dam (blood), Balam (phlegm), Safra (yellow bile) and Sauda (black bile). Health is defined as a well-balanced proportion of humeral fluids in body, while sickness is a condition in which the humeral composition gets imbalanced or a qualitative change occurs. The natural balance of humeral constitution in body is regulated by a power of self-preservation or adjustment called Quwwate-Muddabera or Tabiyat. The practice of ITM helps bring Quwwate-Muddabera or Tabiyat to an optimum level at the onset of a disease to restore humeral balance and regain a healthy condition of body. In ITM, treatment of diseases has three general categories: applying six essential principles, using drugs, and performing outpatient surgeries (treatments) (6, 10-13). The six essential principles refer to the factors, in the absence of which human cannot live, such as atmosphere, foodstuffs and beverages, sleeping wake, movement and inactivity, retention and vomiting and psychological symptoms. Applying "six essential principles" means that a physician should consider the quality and quantity of involved cases and has to carry out the required modifications. It has significant effects on the treatment of diseases; the most important duty of any physician, which has precedence over all other treatments, is to consider the six essential principles. If medication is required, first a drug in singular and then in combinatory forms has to be prescribed. Drug can be taken orally or be applied topically. To treat some diseases like warts, outpatient surgeries such as phlebotomy, bloodletting, cauterizing, cutting, etc. can be applied. To treat warts, it is necessary to consider the patient's six essential principles, modify his dietary, and moisturize his temperament. Medication includes oral and topical consumption of drugs. Orally consumed drugs modify digestion and cause excretion of disease agents such as laxatives. For this purpose, we used *Descurainia sophia* L.

Useful topical drugs refer to a category of drugs which are bitter (bitter: whatever penetrates the surface of tongue and is odious and disgusting), and astringent (astringent: prehensile, the taste experience when a substance causes the mouth to pucker; it causes coldness and dryness, and is referred to what causes retention), such as myrtle. Plant sap (a milky liquid that flows from some of cut plants) can be another topical treatment, such as fig leaf sap; it can be applied on scratched warts. Another treatment for leggy wart is to tie it with a silk yarn and gradually make it tighter. The wart gets gradually weakened and falls (5, 6). In addition, wart has to be continuously lubricated with oils such as flower oil. In the case of numerous warts, it is necessary to apply outpatient surgeries such as phlebotomy to excrete disease causative agents properly, purge the body from the causing agent, and prevent from

relapse of the disease (14, 15). Therefore, there are several treatments in ITM, depending on the cause of wart. Treatments may be general, topical, or both. Some treatments are inexpensive and have low risk. One method of therapy is using myrtle topically (16). In ITM, myrtle is recognized as "Aas" and its berries are known as Habb-ul-Aas. It is often grown for its attractive foliage, flowers and berries. Its berries, leaves and essential oil are frequently used for various ailments (17). According to ITM, it is effective for many diseases. It has bitterness along with astringency and some sweetness. It has some coldness because of its astringency. It has an earthy and rarefied substance. It is called to have mild hotness, though coldness is dominant. Its astringency excels its coldness. Its astringency is more powerful than its coldness. It is a dissolving, astringency drug which strengthens the spirit. It does not have any important side effects in ITM, in conjunction with proper administration of designated therapeutic dosages (18, 19). In classic medicine, myrtle has shown anti-inflammatory effect. The antimicrobial activity of myrtle on *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *P. vulgaris*, *P. mirabilis*, *Klebsiella aerogenes*, *Salmonella typhi* and *S. shigella* has been determined (20-25). Myrtle has even more effects. From time immemorial, plants have been used extensively as curative agents for a variety of ailments. Extensive literature surveys have revealed that myrtle has a long history of traditional use for a wide range of diseases. Many of the traditional uses have been validated by scientific researches. A number of phytochemicals isolated from various plants like flavonoids, coumarins, tannins, etc. have shown a variety of pharmacological activities like anti-diarrheal, anti-ulcer, anti-diabetic, antihypertensive, antioxidant, antimicrobial, antimutagenic, etc. in various clinical and pharmacological trials (17). We studied wart and its treatments in ITM. We selected myrtle and *D. sophia* L. because of the reasons described above. By the way, the plant of myrtle was accessible for us.

## 2. Objectives

The purposes of this study were 1) comparison of the efficacy of *Myrtus communis* L. and *D. sophia* L. versus salicylic acid in reduction of the number and size of warts and 2) comparison of complications such as erythema, itching, etc. in four groups of patients.

## 3. Patients and Methods

This pilot study was a quantitative randomized controlled clinical trial. In this study, 100 patients were selected based on the inclusion and exclusion criteria and then were divided into four groups of 25 by simple randomization (using a computerized list of random numbers). This study was conducted from 2012 to 2013 in Shahid Rahnemoun governmental clinic (Yazd, Iran). Patients, according to our inclusion and exclusion criteria, were referred to the clinic.

The Medical Ethics Committee of Research Institute for Islamic and Complementary Medicine approved the protocol (approval number: 734/p26/m/t, 10/09/2012). The trial was registered in Iranian Registry of Clinical Trials with IRCT number: IRCT2012092710947N1.

The inclusion criteria included: patients 6-45 years old; patients who live in Yazd; total number of warts  $\leq 20$  and diameter  $\leq 1$  cm. The exclusion criteria included: patients less than six years old or more than 45 years old; pregnancy; diabetes mellitus, (DM), nephropathy, cardiovascular diseases; patients who used insulin or sulfonylureas drugs; total number of warts  $> 20$ ; warts on face; anogenital warts; wound or active dermatologic diseases on warts; receiving any treatment during prior month; patients' disaffiliation.

### 3.1. Interventions

Group 1) one drop of 16.5% salicylic acid on each wart topically, once daily for 40 days.

Group 2) one drop of 16.5% salicylic acid on each wart topically, once daily for 40 days and *D. sophia* L. 4.5 g twice a day with adequate boiling water orally, for three months.

Group 3) salving leaves of *M. communis* L., processed by 1 x leaves of *M. communis* L. and 2 x water on each wart topically, twice a day for 40 days.

Group 4) salving leaves of *M. communis* L., processed by 1 x leaves of *M. communis* L. and 2 x water on each wart topically, twice a day for 40 days and *De. sophia* L. 4.5 g twice a day with adequate boiling water orally, for three months.

Base of salicylic acid is flexible collodion 4%. Primary substances are obtained from Sepidaj Pharmaceutical Co., Tehran, IR Iran.

Number, size of lesions and symptoms on days 0, 20, 40 and 90 were evaluated. We measured the largest diameter of the warts at millimeter by ruler and the number of warts by observation and counting. We only had one observer. Furthermore, we took photos of warts before and after the treatment with a digital camera. The relapse rate was investigated three months later. The primary outcome measures were the size and number of warts. The side effects and relapse rate were the secondary outcome measures.

SPSS software version 17.0 was used for statistical analyses. Continuous data were described as mean  $\pm$  SD (medi-

an and IQR for non-normal variables). To assess the changes of number and size of warts in each following period compared to baseline, we used Wilcoxon Signed Rank test in each group. To compare these changes between the groups, Kruskal Wallis test was used. Nominal variables were described using frequency counts and were compared by treatment assignment using chi square test. P value below 0.05 was considered significant.

## 4. Results

A total of 125 subjects were entered into the study, but 100 patients (25 in each group) with number of warts mean  $\pm$  SD of  $3.18 \pm 3.69$  completed the trial and were analyzed. It means that during the study, 25 patients were discarded. Five patients were discarded because they received another drug for their warts at the same time as our study and 20 were discarded because they did not complete the study period. However, we replaced them with new patients and at the end, we analyzed 100 patients who had completed the study. Attrition was not significantly different between the groups. Sixty nine percent of patients were female. Mean  $\pm$  SD of age was  $23.21 \pm 10.03$ . Demographic data are presented in Table 1. Patients in group three were significantly younger than other groups. In groups one and two, warts were mainly in feet and in group three and four in hands. Number and size of warts and the amounts of changes of the number and size of warts in each group during the following period as well as the comparison between the groups are presented in Table 2.

Changes in the number and size of warts during the study were compared between the groups, illustrated in Figures 1 and 2.

After 90 days:

-The number of warts decreased in groups one and two, by similar rates.

-The number of warts decreased in group three faster than other groups.

-The number of warts did not significantly decrease in group four.

-Maximum reduction in the number of warts was seen in group three on day 40.

-Group one had the maximum reduction in the number of warts on day 90.

-Reduction of the size of warts in group three was higher than the other three groups on days 20, 40 and 90.

**Table 1.** Demographic Data of Participants

Group	Age <sup>a</sup>	Gender <sup>b</sup>		Location <sup>b</sup>			
		Male	Female	Foot	Hand	Both	Others
1	22.5 $\pm$ 8.1	9 (36)	16 (64)	13 (52)	9 (36)	1 (4)	2 (8)
2	25.6 $\pm$ 9.8	5 (20)	20 (80)	19 (76)	3 (12)	0 (0)	3 (12)
3	18.4 $\pm$ 8.5	11 (44)	14 (56)	6 (24)	17 (68)	1 (4)	1 (4)
4	26.3 $\pm$ 11.8	6 (24)	19 (76)	9 (36)	10 (40)	0 (0)	6 (24)
<b>P value</b>	0.01	0.2	0.003				

<sup>a</sup> Values are present as mean  $\pm$  SD.

<sup>b</sup> Values are present as No.(%).

-Groups one, two and four were not statistically different in decrease of the size of warts.

-On day 40, complete recovery of warts was seen in group three, more than other groups.

-On day 90, complete recovery of warts was seen in group one, more than other groups.

-On days 20 and 40, complications in group one were significantly higher than other groups.

-Complications were erythema, obscure, hyperpigmentation, irritation, itch, slough, ulceration and pain.

-On day 90, the frequency of side effects was similar in the four groups.

-On day 90, none of the groups had relapses.

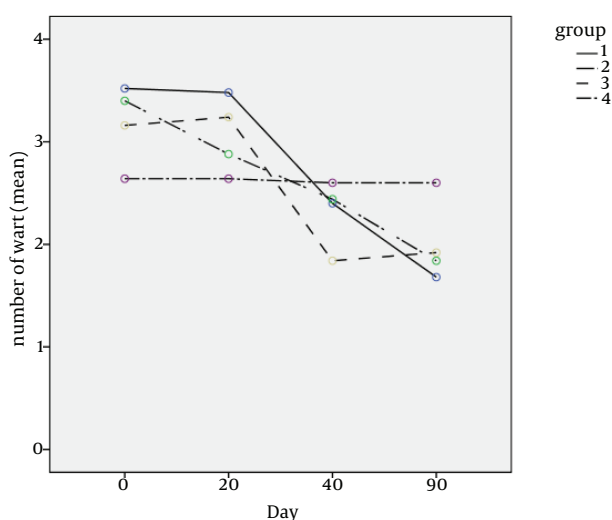
To assess the effects of each intervention according to age and location of warts, Spearman's rho and Kruskal Wallis test were conducted in each group. There were not

**Table 2.** The Number and Size of Warts and Amounts of Their Changes During the Study

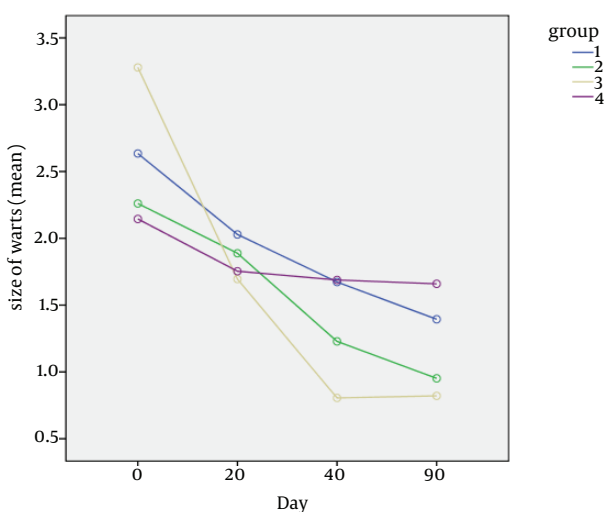
Groups in Different Days/	Median (IQR)	Mean $\pm$ SD	P Value Comparison With Baseline in Each Group <sup>a</sup>	P Value Comparison Between the Groups <sup>b</sup>	Amounts of Changes Compared With Baseline, Mean $\pm$ SD	P Value Comparison of Changes Between the Groups <sup>b</sup>
<b>Numbers of warts</b>						
<b>Day 0</b>				0.7		
1	2(3)	3.52 $\pm$ 4.2				
2	2(3)	3.4 $\pm$ 4.1				
3	1(3)	3.1 $\pm$ 3.3				
4	1(2)	2.6 $\pm$ 3.1				
<b>Day 20</b>				0.8		0.4
1	1(3)	3.4 $\pm$ 6	0.3		0.04 $\pm$ 2.4	
2	1(2)	2.8 $\pm$ 4.5	0.1		0.52 $\pm$ 1.8	
3	1(3)	3.2 $\pm$ 4	1		0.08 $\pm$ 3.8	
4	1(2)	2.6 $\pm$ 3.1	1		0.0 $\pm$ 0.0	
<b>Day 40</b>				0.09		0.02
1	1(3)	2.4 $\pm$ 2.8	0.2		1.12 $\pm$ 4.2	
2	1(1)	2.4 $\pm$ 4.4	0.05		0.96 $\pm$ 2.5	
3	1(1)	1.8 $\pm$ 4	0.01		1.32 $\pm$ 5.1	
4	1(2)	2.6 $\pm$ 3.1	0.3		0.04 $\pm$ 0.2	
<b>Day 90</b>				0.1		0.03
1	1(2)	1.6 $\pm$ 2.7	0.03		1.84 $\pm$ 4.5	
2	1(1)	1.8 $\pm$ 4.9	0.005		1.56 $\pm$ 2.8	
3	1(2)	1.9 $\pm$ 4	0.03		1.24 $\pm$ 5.1	
4	1(2)	2.6 $\pm$ 3.3	0.7		0.04 $\pm$ 0.6	
<b>Sizes of warts</b>						
<b>Day 0</b>				0.06		
1	7(10)	2.6 $\pm$ 2.6				
2	5(8)	2.2 $\pm$ 2.1				
3	5(9)	3.2 $\pm$ 2.7				
4	4(5)	2.1 $\pm$ 1.5				
<b>Day 20</b>				0.005		0.05
1	3(9)	2 $\pm$ 2	< 0.001		0.6 $\pm$ 1.4	
2	4(5)	1.8 $\pm$ 2	0.001		0.37 $\pm$ 2.7	
3	4(8)	1.6 $\pm$ 1.5	< 0.001		1.58 $\pm$ 2.9	
4	3(4)	1.7 $\pm$ 1.1	< 0.001		0.39 $\pm$ 1.7	
<b>Day 40</b>				< 0.001		< 0.001
1	3(7)	1.6 $\pm$ 2.2	< 0.001		0.96 $\pm$ 1.8	
2	2(3)	1.2 $\pm$ 1.2	< 0.001		1.03 $\pm$ 2.4	
3	2(4)	0.8 $\pm$ 1.1	< 0.001		2.47 $\pm$ 3	
4	3(4)	1.6 $\pm$ 1	< 0.001		0.45 $\pm$ 1.7	
<b>Day 90</b>				< 0.001		< 0.001
1	2(4)	1.3 $\pm$ 2.2	< 0.001		1.24 $\pm$ 2.1	
2	1(3)	0.9 $\pm$ 1.3	< 0.001		1.3 $\pm$ 2.3	
3	2(4)	0.8 $\pm$ 1.1	< 0.001		2.45 $\pm$ 3.1	
4	3(5)	1.6 $\pm$ 1.1	< 0.001		0.45 $\pm$ 1.7	

<sup>a</sup> Wilcoxon Signed Rank test was used for comparison before and after.

<sup>b</sup> Kruskal Wallis test was used for comparison between the groups.



**Figure 1.** Comparison of the Number of Warts in the Four Groups



**Figure 2.** Comparison of the Size of Warts in the Four Groups

any significant relationships between the effects of interventions regarding age and location; thus, these two factors were deleted from the list of confounders.

## 5. Discussion

In this study, the number of warts decreased in group three (myrtle) faster than other groups. Reduction of the size of warts in group three was more than the other three groups on days 20, 40 and 90. On days 20 and 40, complications in group one were significantly higher than other groups.

In the recent years, emphasis of research has been on utilizing the vast treasure of traditional medicines with

a long and proven history of treating various ailments. In this regard, further studies are required to be carried out on myrtle for its potential in preventing and treating different diseases.

*M. communis* L. can be used as a topical treatment for warts. It not only shows more rapid response than salicylic acid but also has fewer side effects. It seems that *D. sophia* L. can correct the process of digestion and patients can excrete large amounts of the substances that cause warts. Therefore, it would be better to use it more than 40 days.

Nevertheless, group two that used both *D. sophia* L. and salicylic acid, did not show the same result as group four. It might be due to salicylic acid interactions such as cauterizing drug. Cauterizing drug is a drug, which desiccates burns and hardens the skin, giving it an appearance of burnt coal. Such skin blocks the flow of a liquid humor (if it is there) and is called slough. Therefore, material disposal through the skin was not possible.

In ITM, considering the cause and mechanism of disease generation and causing materials of disease, different treatments should be applied for each patient. Although applying an appropriate treatment is necessary, a unique treatment for all patients cannot be available.

The strong points of our study:

1. We kept in touch with our patients every three weeks.
2. We took digital photos before and after the treatment.
3. The results of this study can be a guide for future studies with larger sample sizes for more precise evaluation of the efficacy of this herb on warts.
4. In addition, patients can take *D. sophia* L. a few months before starting *M. communis* L. as another regimen in other studies.

The weak points of our study:

1. Patients were not blinded to the type of interventions, which was the most important limitation of our study.
2. The shape of the drug was difficult to use. It would be better to prepare more suitable shapes of the drug. For example, myrtle tape may be better to use.

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## Authors' Contributions

Elham Ghadami Yazdi and Minaei developed the original idea and the protocol, collected, abstracted and analyzed the data, wrote the manuscript, and were the study guarantors. Dabaghian, Ebrahim Zadeh and Ranjbar collected and analyzed the data. Seyed Mohamad Rastegari and Ali Ghadami Yazdi contributed to the development of the protocol and collected the data.

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