

Topical Formic acid for the treatment of Common Warts

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Abstract:

Background: Warts are a common chronic disorder that can be cosmetically disfiguring depending on its location.

Cause inhibition of function - The preference of dozens of topical and systemic treatments for warts is a testament to the lack of a rapid, simple, uniformly effective, inexpensive with no scarring and painless treatment.

Objective: The purpose of this study was to determine the efficacy and safety of 85% formic acid application, an inexpensive therapy for the treatment of common warts.

Methods: A placebo-controlled, double blind clinical-trial was performed in 79 patients with common warts diagnosed in the schools of Kerman city in Iran 42 patients received 85% formic acid application and 37 patients placebo (water) using a topical application every other day. Three times a week.

Results: 81 percent of patients who received formic acid application showed complete disappearance of warts and 9.5% showed partial disappearance of wart after a 4 weeks treatment period compared to 11 percent of patients in the placebo group showed complete response and 2.7% showed partial response (\geq half number of warts disappeared with treatment).

Conclusions: The results show that application of 85% formic acid is a safe, economical, and effective alternative in the treatment of common warts with few side effects and good compliance.

Key words: Topical Formic acid, treatment, common warts.

Introduction

Wart is a common disease caused by infection with Human papilloma virus and are diagnosed by dermatologists, most often in children⁽¹⁾. Out of 1000 children under 16 years old referred to hospital clinic in Cambridge, UK, almost 70% had common warts⁽¹⁾. The

approach to the therapy of warts depends on the age of the patient, the extent and duration of the lesions, the patient's immunologic status and the patient's desire for therapy^(2,3). The current treatment of warts involves primarily physical destruction of the viral infected cells. This destruction is performed by a number of different modalities, including chemical destruction, cryosurgery, electro surgery, lasers and immunotherapy. Oral immunomodulations agents such as cimetidine, have also been used⁽⁴⁾. Formic acid has been used as topical treatment for common warts by Bhat RM, et al, who reported that 92% improvements in comparison with 6% improvement in control group⁽⁵⁾.

In the present study, we used formic acid 85% for the treatment of common warts. Formic acid is a carboxylic acid. It is so named because it was first obtained by the distillation of red ants (Latin: Formica=ant). It is used in various industries^(6,7). Formic acid 8% has been used to remove nits in pediculosis capitis⁽⁸⁾.

Methods

A placebo-controlled, double blind clinical trial was performed in 79 patients with common warts at the schools of Kerman city in Iran, (27 males and 52 females, aged 12-17 years) were included in the study. Patients were divided in two groups. Group I consisted of 42 patients treated with 85% formic acid, application. Group II consisted of 37 patients treated with placebo (water) application. Patients with warts on the eyelids, lips and anterior nares were excluded from the study. Patients with other systemic diseases were also not included in the study. Also the patients who failed to adhere to our treatment schedule (4 in group I and 1 in group II) were excluded of this study. They were replaced by new patients.

Technique

Warts in group I and II were treated by application of formic acid or water with a cotton stick swab. All the patients were treated on alternate days three times a week for 4 weeks. The number of applications was restricted to 12, after which the treatment was considered to have failed. All patients were followed up once a month for a period of 3 months. The appearance of new lesions and the presence of secondary infection and other side effects were noted.

Results

A total of 42 patients (15 males and 27 females) re-

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ceived formic acid application (group I) and 37 patients (12 males and 25 females) received placebo (water) application (group II) for warts. The average duration of the disease was 19.43 months in group I [standard deviation (SD)=11.01). 14.46 months] and 17.43 months in group II (SD=13.20 months). The average number of lesions in group I was 2.21 (SD=1.99) and in group II was 2.54 (SD=3.10). In both group, most patients had between one and five lesions, i.e. 78% in group I and 80% in group II.

The sites of warts included the Scalp, Trunk, feet, periungual region and hands. The hands were predominant site in both group many patients had involvement of more than one site the average number of application required for the warts to disappear in group I was 5.92 (SD=3.80) and in group II was 11.08 (SD=2.65) see Table 1 and 2). The efficiency of therapy was assessed at the end of 1 month of treatment: 81% showed complete response and 9.5% showed partial response in group I and

group II: 11% showed complete response and 2.7% showed partial response (\geq half number of wart disappeared with treatment (see Table 3). Thus, in this study, 34 patients of group I showed complete clearance of warts and 4 patients showed partial clearance after a maximum of 12 applications. In group II, only four out of 37 patients showed the complete disappearance of warts and one patient showed partial response. The results of group II were not tabulated as only four patients showed complete resolution before 12 applications. Observed difference in complete clinical cure is 70%, p value <000005.

There is no secondary infection in the formic acid group, there is two (4.8%) cases of atrophic scar and three (7.1%) cases of hyper trophic scar and two (4.8%) cases of post inflammatory, hyper pigmentation in the formic acid group so there is three (7.1%) cases Relapse of warts in the formic acid group in three months follow up.

Table 1 – Number of alternate day treatments in both groups:

Number of Application- Days	Number of patients				Total	
	Group I	%	Group II	%	Case	%
1 – 4 days	22	52	4	10.8	26	31.4
5 – 8 days	8	19	0	0	8	9.5
9 – 12 days	12	29	33	89.2	45	59.1

Table 3 - Complete Clinical resolution of warts at 3-months

Group	Group I Formic Acid	Group I INormal Saline	Total Cases
Complete Resolution			
Yes	34	4	38
No	8	34	42
Total	42	38	80

X2 = 37 P0.00000 <-----

Table 2 – Applications required to achieve clinical cure by location with Formic acid in group I

Number of applications Clinical cure Days	Sites of warts				
	Trunk N=8	Scalp N=2	Hands N=72	Limbs N=3	Total N=85
1	0	1	2	0	3
2	1	0	22	1	24
3	0	0	19	1	20
4	0	0	15	0	15
5	1	0	7	0	8
6	1	0	2	1	4
7	2	0	2	0	4
8	0	0	0	0	0
9	1	0	1	0	2
10	1	0	1	0	2
11	0	0	0	0	0
12	1	0	1	0	3

Discussion

In the patients described in this study, formic acid application for warts was safe and effective, with minimal side effects. Formic acid is economical and does not require sophisticated equipment. It is painless, can be used in children, and it does not require any local anesthesia and scarring is minimal. Three patients with periungual warts did not respond to this treatment.

Among the various caustic acids used in the treatment of common warts, salicylic acid is the weakest, trichloroacetic acid is of medium strength, and bichloroacetic acid is the strongest. Formic acid is stronger than salicylic acid, but less caustic than trichloroacetic acid in the field of dermatology, 8% formic acid has been shown to be useful as a post pediculocidal nits

removal system. We have used 85% formic acid in the treatment of warts. The exact mechanism of action of formic acid is not known. It probably acts in a manner similar to formalin, which causes destruction of the wart-infected tissue by dehydration⁽⁹⁾. After application of formic acid, the wart becomes slightly whitish in color and the superficial layer peels off indicating a keratolytic effect. Although 85% formic acid is caustic careful application over the wart area only prevents its harmful effects on the skin. We believe that 85% formic acid application can serve as a safe, cheap and effective in the treatment of common warts. A multi center trial with 85% formic acid application for common warts may help to standardize the treatment regimen and safety.

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