

## Treatment of Plane Warts by Topical Trichloroacetic Acid with Two Concentration (35% & 70% ); A Comparative Therapeutic Study

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### ABSTRACT:

#### BACKGROUND:

Plane warts represents a common dermatological problem and self-limiting viral infection of the skin caused by human papilloma viruses type (3,10,28,29) with no uniformly effective treatment modality.

#### OBJECTIVE:

To evaluate and compare the effectiveness and side effect of topical trichloroacetic acid solution in two concentration (35% & 70%) for treatment of plane warts.

#### PATIENTS AND METHODS

This is a comparative interventional therapeutic study conducted at the dermatology center of Baghdad Teaching Hospital / Medical City . Sixty consecutive patients with plane warts were randomly assigned into two groups of thirty patients each; group A received topical trichloroacetic acid 35% (9 patients defaulted for unknown reasons) and group B received topical trichloroacetic acid 70% (8 patients defaulted for unknown reasons) once weekly application by doctor at hospital with wood stick once weekly until complete response of the lesions or for at least four weeks. Patients with complete response follow up monthly for 3 months for detecting recurrence.

#### RESULTS:

In group (A) 9 (42.85 %) patients from showed complete response, with 9 (42.85 %) patients showed partial response; the remaining 3 (14.28%) patients showed no response (p value < 0.05) with complete response (7 from 9) need 4-8 weeks of treatment, while in group (B) 13 (59.09 %) patients showed complete response, with 8 (36.36 %) patients showed partial response; the remaining one (4.54 %) patients showed no response, (p value < 0.05) with complete response (8 from 13) need two to four weeks of treatment i.e TCA 70% faster response. Most of patient suffer from burning sensation & itching as a side effects and few patients with erythema & dyspigmentaion. There are 2 (9.52%) recurrent cases from group 35% with 1 (4.54%) recurrent case in group 70% .

#### CONCLUSION:

both concentrations are effective in treatment of plane warts with a faster response in 70% concentration.

**KEYWORDS:** plane wart, TCA

### INTRODUCTION:

Warts are benign proliferation of skin and mucosa that result from infection with human papilloma viruses (HPVs).<sup>(1)</sup> plane warts present as multiple, flat-topped, smooth surfaced papules, sometimes grouped or confluent.<sup>(2)</sup> The lesions usually are yellow-brown or flesh-colored and may be hyperpigmented on darker skin. Individual lesions generally are 2 to 5 mm in diameter and often are asymptomatic.<sup>(3)</sup> The face and back of hands and the shins are

the sites of predilection and the number of lesions ranged from 2 to hundreds.<sup>(4)</sup> Plane warts occur mostly in children and young adults<sup>(5)</sup> Useful finding is the tendency of warts to koebnerize forming linear, slightly raised papular lesions, of all clinical HPV infections, plane warts have the highest rate of spontaneous remission.<sup>(6)</sup> There are many modalities for the treatment of plane warts, the form of therapy used depend on the number of lesions , site , age of the patient and the previous therapies used and their success and failure. <sup>(6)</sup>TCA is an analogue of acetic acid in which the three hydrogen atoms of the methyl group have all been replaced by chlorine atoms.

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## TREATMENT OF PLANE WARTS

TCA is naturally found as hygroscopic and deliquescent crystals and is dissolved in distilled water to make aqueous solutions. The standard pharmaceutical method of preparing TCA solutions for dermatological use is the weight in volume (w/v) method, producing a clear and colourless liquid with no precipitate or particles.<sup>(7)</sup> Trichloroacetic acid is used as a caustic on the skin or mucous membranes to treat local lesions. Its chief medicinal use is in the treatment of ordinary warts and flat warts, although there are reports of its use in removing tattoos, treating genital warts and in dermal peeling.<sup>(8)</sup>

Hence, the objective of present study is to evaluate and compare the effectiveness and side effect of topical TCA solution in two concentrations (35% & 70%) for treatment of plane warts.

### PATIENTS AND METHODS

This is a comparative interventional therapeutic study conducted at the dermatology center of Baghdad Teaching Hospital / Medical City from August/ 2017 to October/2018. Sixty patients were enrolled in this study, their ages ranged from (4 - 48) years, (mean  $\pm$ SD=16.25 $\pm$ 11.36 years). Number of warts per patients ranged from (3 - 50) (mean  $\pm$ SD=17.83 $\pm$ 8.95 warts) and duration of warts ranged from (1- 36) months (mean  $\pm$ SD=10.63 $\pm$ 8.01 months) they were located on the face, arm, forearm and hands. Only (43) patients completed the study, the remainder defaulted for unknown reasons. Full history was taken from each patient regarding gender, age, medical history, drug history, dermatologic history and any previous treatment modality. Physical examination was done to assess the number, location and size of the lesions.

**Inclusion Criteria:** Patients presenting with plane warts irrespective of age, sex, site and duration were included in the study.

**Exclusion criteria:** The following patients were excluded from this study :

1. Pregnant & nursing women.
2. Patients with immune suppression disease or malignant disorders.

The patients were divided randomly into two groups, the 1st group (A) treated with 35% TCA and the 2nd group (B) with 70% TCA once weekly application until complete response

of the lesions or for at least 4 weeks and the course of treatment and possible adverse effects were explained to the patients and their consent were obtained.

**Drug preparations:** 35gm and 70gm of TCA crystals were dissolved in 100 ml of distilled water (weight /volume) (W/V) for each one to prepare a 35% and 70 % of TCA solution respectively.

**Method of application:** TCA solution was applied only to the warts by a physician once a week with wood stick and allowed to dry.

**Follow up and evaluation:** Patients were evaluated and photographed at the first visit and weekly at each session , several photos was taken for each patient using digital camera. The results were assessed as follows:

1. Complete response : is defined as total clearance of warts with no evidence of residual warts.
2. Partial clearance: was defined as improvement or decrease in the number and size of warts, but without complete clearance of warts.
3. No improvement: was defined as warts in which there was no reduction in number or size. All completed response patients followed-up monthly for a period of 3 months. Reappearance of warts, at the sites of earlier lesions during follow up was considered as "Recurrence".

### RESULTS:

#### Group A TCA 35%

Fourteen females and seven males with a female to male ratio of 2:1 . Their ages ranged from 4 to 30 years (mean  $\pm$ SD =12.4  $\pm$  7.6 years). The number of warts per patient ranged from 7 to 46 (mean  $\pm$  SD = 21.33  $\pm$  9.31 warts). The duration of the lesions ranged from 2 to 36 months (mean  $\pm$ SD =12.3  $\pm$  9.2 months).

#### Group B TCA 70%

Sixteen females and six males with a female to male ratio of 3:1. Their ages ranged from 4 to 46 years (mean  $\pm$ SD =21.5  $\pm$  12.5 years). The number of warts per patient ranged from 3 to 50 (mean  $\pm$  SD = 15.8  $\pm$  9.9 wart). The duration of the lesions ranged from 2 to 24 months (mean  $\pm$ SD =11.9  $\pm$  7.7 months).

## TREATMENT OF PLANE WARTS

Regarding response to treatment 9 patients from group A (p value= 0.001) and 13 patients from group B (p value=0.00002) showed complete response (table-1).

Seven from nine patients completely response need 5-8 sessions of treatment in group A, while 8 from 13 patients completely response need 2-4 sessions of treatment (table-2). The response rate statistically insignificant between group A & group B were (p value =0.41), while the numbers of session statistically significant (p value = 0.035) with response rate.

The comparison between group A & group B with respect to different independent variables including age, sex, numbers, & duration of lesions show statistically insignificant value  $>0.05$ .

Most of patient suffer from burning sensation & itching as a side effects and few patients with erythema & dyspigmentation (table-3). There are 2 recurrent cases from group 35% with 1 recurrence in group 70%.

**Table -1: Response to treatment in the two groups at the end of study**

Response	Group A TCA (35%)	Group B TCA (70%)	Total
Complete Response	9	13	22
Partial Response	9	8	17
No Response	3	1	4
Total	21	22	43
	$\chi^2 = 10.7$ p = 0.001	$\chi^2 = 18.1$ p = 0.00002	
$\chi^2 = 1.7$ , P = 0.41			

**Table-2: the numbers of treatment sessions in 2 groups with response to rate**

Numbers of sessions or applications	Group A 35% TCA (n=21)			Group B 70% TCA (n=22)			Total
	Complete response	Partial response	No response	Complete response	Partial response	No response	
≤ 4	2	1	3	8	3	1	18
5 – 8	7	6	-----	5	4	-----	22
> 8	-----	2	-----	-----	1	-----	3
Total	9	9	3	13	8	1	43
$\chi^2 = 11.95$ , p = 0.035							

**Table -3: Side effects of treatment in both groups**

Side effects	35 %	70 %	Total
Burning sensation	17	18	35
Itching	10	12	22
Erythema	2	3	5
Dyspigmentation	5	7	12



Figure-1 A :14 years female before treated with TCA35%



Figure-1 B: same patient after treatment with TCA35%



Figure-2 A: 22 years male before treatment with TCA 70%



Figure-2 B: same patient after treatment with TCA 70%

**DISCUSSION:**

TCA is widely used in treatment of warts <sup>(4)</sup> However, there is no consensus regarding the concentration used.

TCA's destructive activity is due to its acidity in aqueous solutions. The acid is rapidly neutralized as it progresses through the different skin layers, leading to a coagulation of skin proteins and destruction of the epidermis and upper papillary dermis, followed by epidermal and dermal regeneration with new collagen deposition and normalization of the elastic tissue. <sup>(7)</sup>

In this study the acid was applied weekly by the treating physician with two concentrations resulting in complete response rate 42.85% with duration of treatment need four to eight weeks in group (A) and complete cure rate 59.09% with duration of treatment need equal or less than four weeks in group (B) , so both concentration are effective and faster effect with TCA 70% .

Comparing the study to other studied where used TCA solution **Pezeshkpoor et al.** used different concentration of TCA in treatment of common warts (80% and 35%)(46.7%) and (12%) after 6 weeks. <sup>(9)</sup> **Jayaprasad et al,**

## TREATMENT OF PLANE WARTS

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Comparative Evaluation of topical 10% Potassium Hydroxide and 30% TCA in the treatment of Plane Warts. Showed cure rate 11% complete response with TCA30% after 12 weeks by weekly application by doctor with cotton-tipped toothpick under cover of Vaseline to surrounding normal skin.<sup>(10)</sup> **Raghif** used 30% solution of trichloroacetic acid (TCA) in treatment of flat warts in comparison with 0.025% solution of tretinoin achieving cure rate 52.3 % after 12 weeks with TCA by single application every two week.<sup>(11)</sup>

### CONCLUSION:

TCA solution in two concentration (35% & 70%) are effective topical therapies in the treatment of plane warts , both are easily available and inexpensive and both can be prescribed as doctor remedies (at hospital). The TCA 70 % faster action.

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