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ORIGINAL ARTICLE

Comparing Efficacy of 35% Trichloroactetic Acid Versus 10% Potassium Hydroxide in Topical Treatment of Palmoplantar Warts in patients upto 12 years of age

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ABSTRACT

Background: Wart is a viral skin infection. Its etiological agent is human papilloma virus. It is composed of non-malignant proliferations of keratinocytes. Different regimens have been tried for the treatment of warts. 35% Trichloroacetic acid (TCA) is used conventionally but 10% KOH has shown promising results.

Objective: To compare the efficacy of topical 35% Trichloroacetic acid (TCA) versus topical 10% Potassium Hydroxide (KOH) in the treatment of palmoplantar warts in children up to 12 years of age.

Methods: A total of 148 cases of palmoplantar warts with age between 3-12 years of either gender were enrolled in the study. These cases were divided into two groups (A and B each having 74 patients). The patients in group A were treated with topical 35% TCA and Group B patients were treated with topical 10% KOH. Patients were followed weekly for 8 weeks for treatment and for further 8 weeks to look for recurrence. Final outcome was seen at 16 weeks. The efficacy was labelled as yes in cases with clearance of all disease lesions.

Results: In this study overall patients were 148 with 74 cases in each group. Group A had 36 (48.65%) males and group B had 37 (50%). The mean age in group A was 7.42±2.48 and in group B was 7.81±2.50 years. Group A had 44 (59.46%) cases and group B had 47 (63.51%) cases, with age range of 8-12 years. The efficacy in group A was seen in 28 (37.84%) of cases while in group B it was seen in 57 (77.03%) cases. There were significantly better results seen in group B as compared to group A in terms of efficacy with p= 0.0001.

Conclusion: The efficacy of 10% KOH is significantly better than 35% TCA and this difference is again significantly better in terms of all the confounding variables i.e. age, site, size and duration of warts.

Keywords: Warts, Human Papilloma Virus, 10% Potassium Hydroxide, 35% Trichloroacetic Acid

INTRODUCTION

Verruca or wart is a benign mucocutaneous viral infection caused by various serotypes of human papilloma virus[1]. A variety of treatment modalities has been used for treating warts with variable results along with multiple concerns regarding the side effects and cost of treatment. The various factors which affect successfulness of treatment include nature of warts, their exact site, degree of pain, the patient's follow up, the patient's expectations, and the immune status of body.[2] it is noted that warts may clear spontaneously in 65 % cases at 2 years and 80% at 5 years[3].

Treatment options has been used so far for warts include salicylic acid, liquid nitrogen cryotherapy, topical imiquimod, topical cidofovir, duct tape application, cantharidin cream, tretinoin cream, tri-chloroacetic acid (TCA) chemical peel, potassium hydroxide (KOH), electrocautery etc.[4-6] Among all these, salicylic acid was thought to be most successful in previous studies; though few contradict it.[7-8]

The purpose of this search was to find out an effective treatment modality in children in situations where standard treatment options such as cryotherapy, salicylic acid and electric cautery are not available or can't be done due to any reason. For treating warts using topical 10 % KOH vs. 35% TCA, there was paucity of the work not only in Pakistan but also globally. That's why present search was carried out to find studies that compare the 10% KOH and 35% TCA in palmo-plantar warts in children in our region.

Methodology: This study was done in outpatient department of tertiary care hospital (Sheikh Zayed Hospital Rahim Yar Khan, Punjab, Pakistan from; 13.11.2016 to 12.05.2017). It was a randomized control trial. Non probability consecutive sampling was done.

Inclusion Criteria were:

1. Age 03-12years
2. Both genders
3. Warts of any size and number lasting for more than 3 months in duration at palmer or plantar surface.

Exclusion Criteria were:

1- Age >12 years and < 03 years
2- Warts at sites other than palms and soles.
3- Cases who took any treatment for these warts in last 3 months.
4- Patients having hypersensitivity to the drugs used in the study (assessed by history and medical record).

Data Collection Procedure: After getting approval from hospital ethical committee and an informed consent from each patient, total 148 patients were enrolled in the study. Socio-demographic data of subjects of this study like age, sex and clinical data like site, size, number and duration of warts were also recorded on a predesigned performa. The cases were then divided into two groups having 74 cases each. Group A Patients were asked to apply topical 35% TCA over lesions weekly. Group B patients were treated with application of topical 10% KOH over lesions every night. Patients were followed weekly for 8 weeks for treatment and for another 8 weeks to look for recurrence (appearance of warts again which were disappeared). Final outcome was seen at 16 weeks and the patients were labelled as cured and the efficacy was labeled as yes in cases with absence of all the lesions. The results were recorded on same Performa.

Data Analysis: Data was analyzed with the help of SPSS version 17. Quantitative variables like age, duration of warts, number of warts, size of warts and duration taken to cure were presented in terms of mean ± SD (Standard Deviation). Frequency & percentages were calculated for gender, site of warts and outcome variable that is in the form of efficacy (yes/no). For comparing the efficacy of both groups chi square test was used ;taking p-value < 0.05 as significant. Effect modifiers were controlled through stratification of age, gender, duration of warts, number of warts, site and size of warts to see the effect on outcome variable. Post stratification chi-square test was applied taking p-value < 0.05 as significant.

RESULTS

In this study there were total 148 cases with 74 in each group. There were 36 (48.65%) males in group A and 37 (50%) in group B. The mean age in group A was 7.42±2.48 years and 7.81±2.50 years in group B. There were 44 (59.46%) cases in group A and 47 (63.51%) in group B with age range of 8-12 years. The efficacy in group A was seen in 28 (37.84%) cases while in group B it was seen in 57 (77.03%) cases. There were significantly better results seen in group B as compared to group A in terms of efficacy with p= 0.0001 as in table 01.

Table 1: Comparasion between two Groups in terms of Efficacy n= 148

Group	Efficacy		Total	P value
	Yes	No		
A	28 (37.84%)	46 (62.16%)	74	0.0001
B	57 (77.03%)	17 (22.93%)	74	
Total	85 (57.43%)	63 (42.57%)	148	

Table 02: Efficacy with Respect to Gender n= 148

GENDER		EFFICACY		Total	p Value
		Yes	No		
MALE	Group A	12 (31.58%)	26 (68.42%)	38 (50.67%)	.0001
	Group B	28 (75.68%)	09 (24.32%)	37 (49.33%)	
	Total	40 (53.33%)	35 (46.67%)	75 (100%)	
FEMALE	Group A	16 (44.45%)	20 (55.55%)	36 (49.32%)	.004
	Group B	29 (78.38%)	08 (21.62%)	37 (50.68%)	
	Total	45 (61.64%)	28 (38.36%)	73 (100%)	

Table 03: Efficacy with Respect to Age Group n= 148

AGE GROUP		EFFICACY		Total	p Value
		Yes	No		
3 to 7 years	Group A	11 (36.67%)	19 (63.33%)	30 (52.63%)	.007
	Group B	20 (74.07%)	7 (25.93%)	27 (47.37%)	
	Total	31 (54.39%)	26 (45.61%)	57 (100%)	
8 to 12 years	Group A	17 (38.64%)	27 (61.36%)	44 (48.35%)	.0001
	Group B	37 (78.72%)	10 (21.28%)	47 (51.65%)	
	Total	54 (59.34%)	27 (40.66%)	91 (100%)	

Table 04: Efficacy with Respect to Number of Warts n= 148

NUMBER OF WARTS		EFFICACY		Total	p Value
		Yes	No		
SINGLE	Group A	6 (28.57%)	15 (71.43%)	21 (46.67%)	0.001
	Group B	19 (79.17%)	5 (20.83%)	24 (53.33%)	
	Total	25 (55.55%)	20 (44.45%)	45 (100%)	
MULTIPLE	Group A	22 (41.51%)	31 (58.49%)	53 (51.46%)	0.001
	Group B	38 (76%)	12 (24%)	50 (48.54%)	
	Total	60 (58.25%)	43 (41.75%)	103 (100%)	

Table 05: Efficacy with Respect to Size of Warts n= 148

SIZE OF WARTS		EFFICACY		Total	p Value
		Yes n=102	No n=88		
03 or Less (cm)	Group A	33 (63.46%)	29 (36.54%)	52 (50.49%)	0.0001
	Group B	41 (80.39%)	10 (19.61%)	51 (49.51%)	
	Total	64 (62.14%)	39 (37.86%)	103 (100%)	
> 03 cm	Group A	5 (27.73%)	17 (72.27%)	22 (48.89%)	0.003
	Group B	16 (69.57%)	7 (30/43%)	23 (51.11%)	
	Total	21 (46.67%)	24 (53.33%)	45 (100%)	

Table 06: Efficacy with Respect to Duration of Warts n= 148

DURATION OF WARTS		EFFICACY		Total	p Value
		Yes	No		
3-6 MONTHS	Group A	16 (34.78%)	30 (65.22%)	46 (54.76%)	.0001
	Group B	29 (76.32%)	9 (23.68%)	38 (45.24%)	
	Total	45 (53.57%)	39 (46.43%)	84 (100%)	
> 06 MONTHS	Group A	12 (42.86%)	16 (57.14%)	28 (43.75%)	.009
	Group B	28 (77.78%)	08 (22.22%)	36 (56.25%)	
	Total	40 (62.5%)	24 (37.5%)	64 (100%)	

The efficacy was significantly better for group B in terms of both male and female gender with p= 0.0001 and 0.004 respectively as in table 02. This difference was also significant in both the age groups with p= 0.007 and 0.0001 respectively (table 03). The group B had significant better efficacy in terms of number, size, duration and site of warts in both groups as in tables 04-07.

Table 07: Efficacy with Respect to Site of Warts n= 148

SITE OF WARTS		EFFICACY		Total	p Value
		Yes	No		
Palm	Group A	6 (16.22%)	31 (83.78%)	37 (54.41%)	0.0001
	Group B	23 (74.19%)	8 (25.81%)	31 (45.59%)	
	Total	29 (42.65%)	39 (57.35%)	68 (100%)	
Plantar	Group A	22 (59.46%)	15 (40.54%)	37 (46.25%)	0.08
	Group B	34 (79.07%)	9 (20.93%)	43 (53.75%)	
	Total	56 (72.5%)	24 (27.5%)	80 (100%)	

DISCUSSION

Histologically warts are composed of non-malignant keratinocyte proliferations; caused by various subtypes of human papillomavirus (HPV). It is very common disease that predominantly affects young people. There are many clinical types of warts; the warts at the palm and plantar surfaces are well reported in the outpatient department of Dermatology.

The nature and course of the warts is variable. They may show very rapid or very slow growth, may persist without any change in shape or size; and in few cases they clear spontaneously after long period of time. Up till now many treatments were tried for treatment of this condition but none was found 100 % effective. In every treatment modality there is risk of failures and recurrences.

The ideal treatment for viral warts should be efficacious, simple to apply, cost effective, and free of major adverse effects. Though topical treatment with salicylic acid and/or lactic acid is considered to be 1st line but these agents are very slow to work and are difficult to preserve. Cryotherapy with liquid nitrogen or liquid nitrous oxide is also one of the first line treatments. Topical KOH and trichloroacetic acid (TCA) have also variable results.

Potassium hydroxide (KOH) is one of the strong alkaline agents. It has ability to destroy keratin and penetrate deeply into the skin. Due to this action, it has been used successfully to treat molluscum contagiosum especially in children. It is an efficacious, relatively safe and cost-effective therapeutic modality for treatment of warts in genitalia of male patients but their use in common warts is very scarce.[09] A study done in Brazil by Loureiro WR et al demonstrated the good efficacy of KOH for treatment of genital warts in male patients.[10]

In our study the efficacy in group B (treated by 10% topical KOH) was seen in 57 (77.03%) which was statistically significantly higher as compared to group A treated with 35% TCA with p= 0.0001. According to another study done by Wickremasinghe NNTM et al where he compared the KOH preparations with liquid nitrogen and it was seen the both the modalities revealed comparable results.[11] On further analysis he described that the at the end of the treatment of their 90 cases, 30 cases showed efficacy with 10% KOH and 27 did with 5% KOH. This difference was not statistically significant but again supported the data that the higher are the chances of efficacy with potent KOH as compared with lesser strength. The main side effect observed in their study was the irritation at the site of the application that was addressed and overcome with proper education and orientation.

Results of study by Jayaprasad S et al, showed that efficacy of topical KOH 10% at the end of 4th and 8th week was far better than that of 30% TCA application in treatment of warts (i.e., statistically significant $P < 0.01$).[12]

Al-Hamdi and Al-Rahmani compared efficacy of topical 5% KOH solution vs. topical 10% KOH in the treatment of plane warts. They used them as once daily night application for 4 weeks. They found comparable efficacy of both solution in clearing warts (i.e., 80.3% with 5% KOH and 82.1% with 10% KOH).[13] They also noted that action of topical 5% KOH solution was slower than action of 10% KOH solution in clearing warts. Recurrence was also comparable in both groups (i.e., 5.8% with 5% KOH vs. 5.1% with 10% KOH). Similar this study we also used KOH solution as daily

application for 4 weeks but in our study there was no separate analysis done to look for the recurrence of the disease.[13]

In this study there was significant better results seen in terms of both size and number of lesions where 10% KOH revealed better results than 35% TCA. This was also observed by the above mentioned study where the improvement was better in cases that had less number of lesions and also smaller size led to early clearance than the larger one; however they used the mean lesion level and time of clearance rather than single and multiple and the cut off size of 3 cm as was used in our study.[13] The better results with smaller size and less number of lesions itself explains the better outcome as the best results are seen in the early phases of the disease as compared to resistant ones.

The efficacy was also significantly better in both the genders in group treated with 10% KOH but even better results were seen with male gender with p= 0.001 as compared to females where it was seen in 0.004. This was also seen by the study done by Louriro WR et al that also find better efficacy in male gender. Better results can be explained by the factor that male are more conscious and have more access to treatment in our society as compared to females.

Results of our study showed 37.84 % efficacy with topical 35 % TCA. Pezeshkpoor et al. compared efficacy of 35% TCA vs. 80% TCA in treatment of common warts.[14] Both treatment groups showed efficacy but it was more with a higher concentration of TCA solution (80% TCA).

Review of previous studies indicates that higher concentration of topical TCA (60–80%) has comparable cure rates in genital warts vs. cryotherapy. According to the British Association of Dermatologists guidelines weekly application of higher concentration of TCA (50–80%) for 8 weeks in the treatment of hand warts is an excellent treatment option. Reviews of previous studies shows that that there is lack of research work on TCA application in plane warts. More research work is needed in future to compare the efficacy of different concentration of TCA in plane warts.[15-16]

There were few limitations of the study as we did not look separately regarding the recurrence rate of warts among these treatments. The safety profile was also not assessed in the present study. There were many strong points as well as this study was one of the rare one done regarding this context in Pakistan and even internationally there was very scarce data regarding comparison of these two modalities.

CONCLUSION

The efficacy of 10% KOH is significantly better than 35% TCA and this difference is again significantly better in terms of all the confounding variables i.e. age, site, size and duration of warts.

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