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TOPICAL 10% POTASSIUM HYDROXIDE AND 30% TRICHLOROACETIC ACID IN TREATMENT OF PLANE WARTS: A COMPARATIVE EVALUATION

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Abstract:

INTRODUCTION: Warts are benign proliferations of the skin and mucosa caused due to the infection of human papilloma virus. Commonly warts on the hands and feet are caused by HPV serotype 1, 2, 4, 27 and 57. The incidence of warts increases during childhood to reach a peak in adolescence and early adulthood then declines rapidly through the 20s and more gradually thereafter. Trichloroacetic acid is a topical destructive agent which causes hydrolysis of cellular proteins leading to cell death. It is used in treatment of common, cervical, genital, and anal warts. Potassium hydroxide (KOH) is a strong metallic base KOH acts by its keratolytic effects that lead to the destruction of virus-infected cells causing resolution of warts. **MATERIAL AND METHODS**: All patients included were in the range of 4 to 13 years attending the outpatient department of paediatrics and dermatology. Patients were randomized in to two groups of 42 each. The diagnosis of plane warts was made clinically and by physical examination. Location, size and number of warts were recorded. Topical application of 10% KOH to Group A and 30% TCA to Group B was received by the physician once weekly. The patient was observed for 30 min for any side effects, itching, rashes or eruptions. This therapy was continued for 3 months (12 weeks) once weekly under physician supervision. The average size of all the warts in case of multiple warts was calculated for assessing response. Patients were classified as complete responders, moderate responders and mild responders. If there is no response to treatment then called as no responders. All patients were assessed after 12 weeks. Patients and their parents were assessed for the treatment response on the scale of excellent, good, and satisfactory. **RESULTS**: 42 patients were treated with 10% KOH in group A and 42 in Group B by 30% TCA. Age of the patient was in the range of 5 to 14 years. Duration of warts was from 1 month to 3 years. There were 19 male and 23 female in 10% KOH group while 20 male and 22 female in 30% TCA group. In 10 % KOH group 1 (2.4%) and in 30% TCA group 7 (16.7%) were non-responders. 11 (26.2%) and 17 (40.5%) were mild responders in 10 % KOH group and 30% TCA group respectively. In 10 % KOH group 16 (38.1%) and in 30% TCA group 13 (31.0%) were moderate responders. 14 (33.3%) and 5 (11.9%) were complete responders in 10 % KOH group and 30% TCA group respectively. The result was statistically significant. Patient and their parents subjective response was obtained after 12 weeks of the treatment. In 10% KOH group 17 (40.5%), 12 (28.6%), 12 (28.6%) and 1 (2.4%) responses were excellent, good, satisfactory and poor respectively while in 30% KOH group 6 (14.3%), 17 (40.5%), 11 (26.2%) and 8 (19.0%) showed excellent, good, satisfactory and poor respectively. **CONCLUSION**: 10% KOH solution can be effectively used for plane wart treatment in children as it is less irritant and has fewer side effects also in children, it can be easily administered.

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INTRODUCTION

Common warts have been known since early Greek and Roman times[i]. They can affect a patient's quality of life by causing embarrassment, fear of negative appraisal by other people and frustration caused by persistence and recurrence. Patients suffering from warts generally seek medical treatment from general practitioners, pharmacists, naturopaths, allied health professionals and may present with recalcitrant warts that have been previously treated with anything from folk remedies to hypnosis or over the counter medicine. Till date no treatment has yet proven 100% effective for a cure. Almost all treatments have some effect in most cases[ii].

Warts are benign proliferations of the skin and mucosa caused due to the infection of human papilloma virus (HPV). HPV is a double-stranded DNA virus which causes cutaneous viral warts, and are most commonly seen on the skin and genitalia[iii]. Commonly warts on the hands and feet are caused by HPV serotype 1, 2, 4, 27 and 57[iv]. Plane wart or verruca plana are 2 to 4 mm, slightly elevated, skin coloured, flat-topped papules that have minimal scale and are frequently found on face, hands and lower legs[v]. The incidence of warts increases during childhood to reach a peak in adolescence and early adulthood then declines rapidly through the 20s and more gradually thereafter[vi].

No single treatment is fully effective in all patients. Wart treatment would resolve all or a great percentage of warts, be painless, need only one or a part of a wart treated. Many treatment modalities has been studied for the treatment of plane warts. American Academy of Dermatology developed criteria for the indications for wart treatment: 1) the patient's desire for therapy, 2) symptoms of pain, bleeding, itching or burning, 3) disabling or disfiguring lesions, 4) large numbers or large sizes of lesions, 5) the patient's desire to prevent the spread of warts to unblemished skin of self or others, and 6) an immuno compromised condition[vii].

Treatment by Hypnosis, Garlic extracts[viii], Occlusive duct tape treatment proposed by Dr. Jerome Litt[ix] , destructive therapies which range from surgical curettage to cautery to caustic chemical ablation, and from cryotherapy to hyperthermic therapy[x]. Surgical removal of warts by curettage and then followed by cautery was an early and still widely practiced method of treatment[xi]. Salicylic acid, trichloroacetic acid, cantharidin and cryotherapy[xii]. Most treatments focus primarily on the destruction or removal of visible lesions or induction of cytotoxicity against the infected cell.

Trichloroacetic acid is a topical destructive agent which causes hydrolysis of cellular proteins leading to cell death. It is used in treatment of common, cervical, genital, and anal warts in the concentrations of 70-80%[xiii].

Potassium hydroxide (KOH) is a strong metallic base. In medical practice, it is used in the diagnosis of fungal infection and diagnosis of bacterial vaginosis[xiv]. Treatment of molluscum contagiosum in children[xv]. KOH acts by its keratolytic effects that lead to the destruction of virus-infected cells causing resolution of warts. As it is less irritating, less painful and can be used safely in the children.

MATERIAL AND METHODS:

This is a comparative therapeutic study conducted in the Department of Dermatology, at Shri Vinoba Bhave Civil Hospital, Silvassa in collaboration with GMC New Civil Hospital, Majura Gate Surat. A total 84 consecutive patients of multiple cutaneous plane warts selected from skin. All patients included were in the range of 4 to 13 years attending the outpatient department of paediatrics and dermatology. Patients excluded hypersensitivity to KOH or TCA, patients currently using any treatment for warts or having used any other treatment for warts within the last 1 month, warts on genitalia and mucosa. Patients who are on immunosuppressive drugs were also excluded from the study.

Patients were randomized in to two groups of 42 each. A systematic random procedure was chosen. Written informed consent was obtained from each patient. The diagnosis of plane warts was made clinically and by physical examination.

Location, size and number of warts were recorded.

Topical application of 10% KOH to Group A and 30% TCA to Group B was received by the physician once weekly. For application surrounding skin was covered with Vaseline and by cotton bud topical solution was applied on the warts. The patient was observed for 30 min for any side effects, itching, rashes or eruptions. This therapy was continued for 3 months (12 weeks) once weekly under physician supervision. The average size of all the warts in case of multiple warts was calculated for assessing response.

Patients were classified as complete responders if there is complete disappearance (100%) of all the warts. 50% to 99% resolution were called as moderate responders and < 50 % resolution were called as mild responders. If there is no response to treatment then called as no responders. All patients were assessed after 12 weeks.

Patients and their parents were assessed for the treatment response on the scale of excellent, good, and satisfactory.

RESULTS:

42 patients were treated with 10% KOH in group A and 42 in Group B by 30% TCA. No patient in both the group developed allergic or adverse reactions. Age of the patient was in the range of 5 to 14 years. Duration of warts was from 1 month to 3 years.

Table 1: Characteristics in group A and B

Characteristics	Group A (10% KOH)	Group B (30% TCA)
Mean Age± SD	11.2 ± 6.4	10.9 ± 5.6
Male (%)	19 (45.2%)	20 (47.6%)
Female (%)	23 (54.8%)	22 (52.4%)
Total	42	42

Mean age in Group-A (10% KOH) was 11.2 ± 6.4 and in Group-B (30% TCA) was 10.9 ± 5.6. there were 19 male and 23 female in 10% KOH group while 20 male and 22 female in 30% TCA group. After 12 weeks response of both the group was observed and noted

Table 2: Clinical outcome at 12 weeks

Response	group A (10% KOH)	Group B (30% TCA)	Total
Non responders	1 (2.4%)	7 (16.7%)	8 (19.0%)
Mild responders	11 (26.2%)	17 (40.5%)	28(66.7%)
Moderate responders	16 (38.1%)	13 (31.0%)	29(69.0%)
Complete responders	14 (33.3%)	5 (11.9%)	19(45.2%)

Table 3: Chi square test

Group	Non responders	Mild responders	Moderate responders	Complete responders	*Total*
10% KOH	1 (4.00) [2.25]	11 (14.00) [0.64]	16 (14.50) [0.16]	14 (9.50) [2.13]	42
30% TCA	7 (4.00) [2.25]	17 (14.00) [0.64]	13 (14.50) [0.16]	5 (9.50) [2.13]	42
Total	8	28	29	19	-

The chi-square statistic is 10.3592. The p-value is .015747. The result is significant at p < .05.
In 10 % KOH group 1 (2.4%) and in 30% TCA group 7 (16.7%) were non-responders. 11(26.2%) and 17 (40.5%) were mild responders in 10 % KOH group and 30% TCA group respectively. In 10 % KOH group 16 (38.1%)and in 30% TCA group 13 (31.0%) weremoderate responders. 14 (33.3%) and 5 (11.9%) werecomplete responders in 10 % KOH group and 30% TCA group respectively. The result was statistically significant.

Table 4: Patient compliance

Response	**group A (10% KOH)**	**Group B (30% TCA)**	**Total**
Excellent	17 (40.5%)	6(14.3%)	23(54.8%)
Good	12(28.6%)	17(40.5%)	29(69.0%)
Satisfactory	12(28.6%)	11(26.2%)	23(54.8%)
Poor	1(2.4%)	8(19.0%)	9(21.4%)

Patient and their parents subjective response was obtained after 12 weeks of the treatment. In 10% KOH group 17 (40.5%), 12 (28.6%), 12 (28.6%) and 1 (2.4%) responses were excellent, good, satisfactory and poor respectively while in 30% KOH group 6 (14.3%), 17 (40.5%), 11 (26.2%) and 8 (19.0%) showed excellent, good, satisfactory and poor respectively.

Table 5: Chi square statistics.

Group	Excellent	Good	Satisfactory	Poor	***Total***
10% KOH	17 (11.50) [2.63]	12 (14.50) [0.43]	12 (11.50) [0.02]	1 (4.50) [2.72]	42
30% TCA	6 (11.50) [2.63]	17 (14.50) [0.43]	11 (11.50) [0.02]	8 (4.50) [2.72]	42
Totals	23	29	23	9	

The chi-square statistic is 11.6109. The p-value is .008842. The result is significant at p < .05.

DISCUSSION AND CONCLUSION:

Due to the frustrating resilience and recurrence of many wart cases, commonly combine therapies are adapted by many physicians. In a cross-sectional survey of treatment choices for warts in nine genitourinary medical clinics across the UK, about 11% of all single treatments involved a combination of two or more agents[xvi].also choice of treatment depend upon the number of warts, site, morphology, patient preference for treatment and co-existing medical conditions. plane warts are a common therapeutic problem and disseminated infection on the face is, even in the immunocompetent host is seen in many of the cases[xvii].treatment modalities can be oral, surgical, pulsed dye laser or topical. In children tropical applications are the most suitable treatment modality due to patient compliance. In a developing country and in poor setting it is recommended that treatment should be cost effective and affordable to the patient. Topical destructive or caustic agents are safer,

inexpensive, and easy to use in case of plane warts.

In our study it was found that reduction in wart size was better with 10% KOH and was statistically significant. Similar results were shown by Jayaprasad S et al.[xviii] they concluded that 10% KOH had a better response on warts of size 1-5 mm, warts with numbers between 1 and 10, and warts of duration 2-9 months as compared to 30% TCA and also warts over the face had a tendency of complete clearance compared to other sites. In our study some patients showed hyperpigmentation by 30% TCA due to which patient response was slightly poor or unsatisfactory.

In our study in 10 % KOH group 1 (2.4%) were non-responders. 11 (26.2%) were mild responders 16 (38.1%) were moderate responders. 14 (33.3%) were complete responders.In a study by et al 63 patients (66.3%)showed complete response, 27.3%showed partial response and 6.3%showed no response they also observed that 10% KOH is better than 5% KOH[xix].

In 30% TCA group 7 (16.7%) were non-responders, 17 (40.5%) were mild, 13 (31.0%) were moderate responders. and 5 (11.9%) were complete responders.

Patient and their parents subjective response was obtained after 12 weeks of the treatment. In 10% KOH group 17 (40.5%), 12 (28.6%), 12 (28.6%) and 1 (2.4%) responses were excellent, good, satisfactory and poor respectively while in 30% KOH group 6 (14.3%), 17 (40.5%), 11 (26.2%) and 8 (19.0%) showed excellent, good, satisfactory and poor respectively.

In our study it was observed that complete response of patients was more in KOH group as compared to the TCA group and it was statistically significant. Also Patient and their parent's subjective response was better in KOH group. No major side effect was observed in both the group except mild irritation and itching.

10% KOH solution can be effectively used for plane wart treatment in children as it is less irritant and has less side effect also in children it can be easily administered as cryo, or surgery or other modalities are difficult to do on children. But the sample size was small to compare the results of both the agents so bigger cohort studies are required to confirm the present findings.

REFERENCES:

1. [i]Leman JA, Benton EC. Verrucas. Guidelines for management.Am J Clin Dermatol. 2000 May-Jun; 1(3):143-9.
2. [ii]Lipke MM. An armamentarium of wart treatments. Clin Med Res. 2006;4(4):273-93.
3. [iii]Rivera A, Tyring SK. Therapy of cutaneous human Papillomavirus infections.Dermatol Ther. 2004; 17(6):441-8.
4. [iv]Gibbs S, Harvey I, Sterling JC, Stark R. Local treatments for cutaneous warts.Cochrane Database Syst Rev. 2003; (3):CD001781.
5. [v]Lowy DR, Androphy EJ. Warts. In : Freedberg IM, Eison AZ, et al . Fitzpatrick's Dermatology in General Medicine, 6 th ed. Mcgraw-Hill Co: New York; 2004. p. 2119-29.
6. [vi]Sterling JC. Virus infections. In: Burns T, Breatnatch S, Cox N, Griffith C, editors. Rook's Textbook of Dermatology. 8 th ed. West Sussex, UK: Wiley-Blackwell; 2004. p. 33.39-41.
7. [vii]Kuykendall-Ivy TD, Johnson SM. Evidence-based review of management of nongenital cutaneous warts.Cutis. 2003 Mar; 71(3):213-22.
8. [viii]Weber ND, Andersen DO, North JA, Murray BK, Lawson LD, Hughes BG. In vitro virucidal effects of Allium sativum (garlic) extract and compounds.Planta Med. 1992 Oct; 58(5):417-23.
9. [ix]Litt JZ. Don't excise--exorcise. Treatment for subungual and periungual warts.Cutis. 1978 Dec; 22(6):673-6.
10. [x]Sterling JC, Handfield-Jones S, Hudson PM, British Association of Dermatologists.Guidelines for the management of cutaneous warts.Br J Dermatol. 2001 Jan; 144(1):4-11.
11. [xi]Arndt KA, Bowers KE, Alam M, Reynolds R, Tsao S, eds. Warts. In: Manual of Dermatologic Therapeutics. 6th ed.

Philadelphia: Lippincott, Williams & Wilkins; 2002:241–251.

12. [xii]Tabrizi SN, Garland SM.Is cryotherapy treating or infecting?Med J Aust. 1996 Mar 4; 164(5):263.
13. [xiii]Godley MJ, Bradbeer CS, Gellan M, Thin RN. Cryotherapy compared with trichloroacetic acid in treating genital warts. Genitourin Med 1987;63:390-2.
14. [xiv]Brodell RT, Helms SE, Snelson ME. Office dermatology testing: The potassium hydroxide preparation, Am Fam Physician 1991;43:2061.
15. [xv]Romiti R, Ribeiro AP, Grinblat BM, Rivitti EA, Romiti N.Department of Dermatology, University of São Paulo, São Paulo, Brazil. Treatment of molluscumcontagiosum with potassium hydroxide: Clinical approach in 35 children.Pediatr Dermatol 1999;16:228-31.
16. [xvi]McClean H, Shann S. A cross-sectional survey of treatment choices for anogenital warts.Int J STD AIDS. 2005 Mar; 16(3):212-6.
17. [xvii]Weisshaar E, Neumann HJ, Gollnick H. Successful treatment of disseminated facial verrucae with contact immunotherapy.Eur J Dermatol. 1998 Oct-Nov; 8(7):488-91
18. [xviii] Jayaprasad S, Subramaniyan R, Devgan S. Comparative evaluation of topical 10% potassium hydroxide and 30% trichloroacetic acid in the treatment of plane warts. Indian J Dermatol 2016;61:634-9
19. [xix] Al-Hamdi KI, AL-Rahmani MA. Evaluation of topical potassium hydroxide solution for treatment of plane warts. Indian J Dermatol 2012;57:38-41