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Original Article

Efficacy of 10% zinc sulphate solution in the treatment of plane warts

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Abstract

Objective The objective of this study was to evaluate the clinical efficacy of 10% Zinc sulphate solution in the treatment of plane warts.

Methods It was an experimental study conducted in the department of Dermatology Mayo hospital Lahore from 1 June 2017-1 Dec 2017.One hundred patients were collected randomly for this study. They were supplied with 10% Zinc sulphate solution in a suitable container. Patients were instructed to apply the medication to their lesions with a cotton swab at home thrice daily. Patients were assessed every 2 weeks till clearance or for maximum of 12 weeks. Number of lesions were counted to assess efficacy.

Results The mean age of the patients was 28.25±8.08 years. Regarding clearance of lesions it was found that only 5% of the patients showed complete clearance of plane warts, while 95% of the patients showed partial or no clearance.

Conclusion A substantial number of patients showed partial clearance by the use of 10% zinc sulphate solution, but only a low number of patients had complete clearance in response to the drug in the specified period of study. Hence 10% zinc sulphate solution is not effective in the treatment of plane warts, while for future studies it is recommended to use higher concentrations of the drug with suitable physical formulation along with a longer period of study, for expected better results.

Key words
Plane warts, efficacy of zinc, zinc sulphate solution, clearance of warts, use of zinc in warts.

Introduction

Warts are caused by Infection from Human papilloma virus (HPV) which are proliferations on skin or mucosae. Upto 100 different types of HPV have been identified.[1] Warts are not age dependent but are more common in school going age children but uncommon in infancy and early childhood. Immunocompromised patients with defects in their cell mediated immunity carry high risk of infection. Most frequent sites are hands and feet. Cutaneous warts are common in our setting due to less awareness of its contagious mode of transmission either by direct or indirect spread through fomites.

Common types of warts include verruca vulgaris, plane, plantar, anogenital and periungual warts. Diagnosis is usually clinical. They mostly regress spontaneously and donot produce acute symptoms but treatment is required for cosmetic reasons and due to risk of autoinoculation. Treatment modalities often include destructive measures which are painful and also carry risk of scarring. There are several local therapies for warts such as application of salicylic acid, podophyllin, trichloracetic acid,

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imiquimod, formic acid. Other options include pulse dye laser, photodynamic therapy and electrosurgery.[2-9] However, none of these therapies is uniformly effective in the elimination of Warts. Efficacy of these known therapies is still questionable.

Zinc is an essential micronutrient of human body. It is used both in elemental or in its salt forms as a therapeutic modality in dermatology because of its antioxidant, antimicrobial, antiinflamatory and immunomodulatory actions. It can be used as oral, topical and injectable forms. Topical zinc as zinc oxide and zinc sulphate can be used in the form of cream, ointment, paste and lotion. It has a role in various dermatological conditions including pigmentary disorders, inflammatory dermatoses, infections, hair disorders, neoplastic conditions.[10]

Sharquie *et al.* applied topical Zinc sulphate 10% solution to patients with common and plane warts and efficacy was found to be 86% in plane warts.[11] The purpose of this study was to show that topical zinc sulphate, which is a cheap and readily available chemical, has excellent efficacy in plane warts with minimum side effects.

Methods

A total of 100 patients fulfilling selection criteria were enrolled in the study from department of dermatology, Mayo hospital, Lahore. Inclusion criteria included: Patients of either gender aged 18-50 years having plane cutaneous warts and Exclusion criteria included: Immuno-compromised states like infection with HIV, tuberculosis, autoimmune diseases and patients on immunosuppressive drugs etc. on medical record. Patients with systemic medical conditions diseases such as CLD, CRF, diabetes etc. already diagnosed, pregnancy and lactation.

After full explanation about the nature of disease, course and treatment options, follow-up, prognosis, complications and the need for pre and post-treatment photographs, consent was taken from each patient before starting therapy. History was taken regarding age, gender, occupation, residence, age of onset, duration of the disease, family history and any previous treatment used. Physical examination was carried out regarding site, number and type of warts. The patients were supplied with 10% zinc sulphate solution w/v (10g zinc sulphate in 100ml of distilled water) in a suitable container, and instructed to apply the solution to their lesions with a cotton swab at home 3 times daily until complete clearance or for maximum of 12 weeks.

The efficacy was assessed during each clinical visit after every two week follow-up visit. All the above information was recorded on a predesigned proforma. Outcome variables were recorded as per operational definitions. Compliance of patients was ensured through regular follow-up visits. The statistical data was entered and analyzed in SPSS version 20.

Results

Mean age of patients was 28±13.70 years.Among study population 35 (35%) patients were male and 65 (65%) patients were females Regarding site of lesions, there were 59 (59%) patients who had lesions on face, 11 (11%) patients had lesions on hands, 5 (5%) patients had lesion on neck, 3 (3%) patients had lesions on feet and 14 (14%) had lesions on face and hands, 6 (6%) patients had lesions on hands and forearm and 2 (2%) patients had lesions on hands and feet.(Fig:1).Regarding number of lesions 61 (61%) patients had <30 lesions, 15 (15%) patients had lesions ranging from 30-59, 15 patients had lesions ranging from 60-89 and 9 (9%) patients had >90 lesions. Regarding

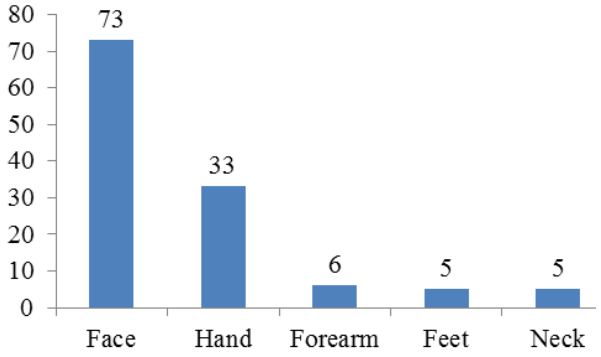

Figure 1 Site of lesions.

Table 1 Distribution of patients by clearance of lesions at follow-up.

Weeks	*Clearance*		
	No	*Partial*	*Complete*
Week 2	37	63	0
Week 4	29	71	0
Week 6	26	73	1
Week 8	25	73	2
Week 10	19	76	5
Week 12	18	77	5

distribution of patients by clearance of lesions at 2 weeks follow-up 37 patients had no clearance, 63 patients had partial clearance while no patient had complete clearance. At 4 weeks 29 patients had no clearance, 71 patients had partial clearance while no patient had complete clearance. At 6 weeks 26 patients had no clearance, 73 patients had partial clearance while 1 patient had complete clearance. At 8 weeks 25 patients had no clearance, 73 patients had partial clearance and 2 patients had complete clearance. At 10 weeks 19 patients had no clearance, 76 patients had partial clearance and 5 patients had complete clearance. At 12 weeks 18 patients had no clearance, 77 patients had partial clearance and 5 patients had complete clearance **(Table 1)**.

Among 100 patients, only 5% showed complete clearance of lesions and 95% did not show complete clearance which indicated that zinc sulphate was efficacious in only 5% patients **(Table 2).**

Clearance of lesions in relation to the age of the

Table 2 Efficacy of 10% zinc sulphate solution.

Efficacy	*Number of Patients*	*Percentage*
Yes	5	5%
No	95	95%
Total	100	100%

$\chi^2 = 100$; df = 1; p = 0.000

Table 3 Clearance of lesions in relation to site of distribution.

Site of Lesion	*Number of Patients*	*Response*	
		Positive	*No*
Face	59	5	54
Hand	11	0	11
Feet	3	0	3
Neck	5	0	5
Face+Hands	14	0	14
Hands+Feet	2	0	2
Hands+Forearms	6	0	6
Total	100	5	95

$\chi^2 = 3.811$; df = 7; p = 0.801

patient showed that among 58 patients in the age group of 18-28 years, none of them showed complete clearance. Among 25 patients in the age group of 29-39 years, 5 patients showed complete clearance. Among 17 patients in the age group of 40-50 years, none of them showed complete clearance. This shows that the patients who showed complete clearance were in the age group of 29-39 years. Among 65 female patients, only 5 patients showed complete clearance. While among 35 male patients none of them showed complete clearance. This shows that the complete clearance was showed in female patients only. The 5% patients who showed clearance completely had lesions on face. No patient with lesions sited other than face showed complete clearance (**Table 3)**.

Discussion

Warts are a common skin disease, especially in children and young adults, caused by human papillomaviruses. So far, there is no definitive therapy for warts and the treatment is modified regularly to obtain the best result with the least

discomfort to the patient. Khattar *et al*. study showed topical zinc sulphate therapy was effective in plane warts in both pilot and in double blind trials and the cure rates were 80% in pilot trial and 86% in the double blind trial. Their study showed that topical zinc sulphate solution was ineffective in patients with common warts, that was probably due to thick hyperkeratotic surface that prevented penetration of the drug when compared with plane warts with thin surface while oral zinc sulphate has been effectively used in the treatment of common warts.[12]

The present study showed a partial clearance in substantial number of patients with the use of 10% zinc sulphate solution, in plane warts. But only a low number of patients had complete clearance in response to the drug, in the specified period of study. 10% zinc sulphate solution showed no important side effects apart from slight itching, pain and transient hypo pigmentation seen in some cases which might occur even in spontaneous resolution of plane warts. The exact mechanism of action of topical zinc sulphate in plane warts is not fully understood but it is speculated that the beneficial effects might be attributed through many effects of zinc, like enhancement of immunity by its immunomodulating action, its direct antiviral effect or due to its cytotoxic effect.

There could be many reasons for the low number of patients with complete clearance in the current study. The commonest problem would be the compliance of patients. Many patients could not come for regular follow ups and their compliance could not be assured regularly. Other factor could be that, patients wasted the applied topical medicine because of the thin physical formulation (water-like consistency) of the solution and it did not stay for longer period of time and is easily washable on washing hands and face. Another finding was that patient who used more quantity of medicine (assessed by their further demand of medicine) had better response which shows that for future studies if higher concentration of drug is used for example 20% solution might be efficacious. If ointment or cream formulations are used for future studies, may result in better outcomes of the study because of longer stay and better application of the drug.

Conclusion

A substantial number of patients showed partial clearance by the use of 10% zinc sulphate solution, but only a low number of patients had complete clearance in response to the drug in the specified period of study. Hence 10% zinc sulphate solution is not effective in the treatment of plane warts, while for future studies it is recommended to use higher concentrations of the drug with suitable physical formulation along with a longer period of study, for expected better results.

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