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# EFFICACY OF ZINC THERAPY IN VERRUCA VULGARIS-A STUDY IN SHAHEED ZIAUR RAHMAN MEDICAL COLLEGE, BOGURA, BANGLADESH

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**ARTICLE INFO** **ABSTRACT** **ORIGINAL RESEARCH ARTICLE**

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**Introduction:** Verruca vulgaris, caused by human papilloma virus (HPV), is a common skin condition world-wide which may be transmitted through breaks in the skin or autoinoculation into adjacent skin. The most common treatment for warts is physical destruction of the lesion. Treatment on numerous lesions using physical destruction, such as electrocautery, curettage, and cryotherapy is avoided by some patients due to pain, discomfort, recurrence and prolonged healing time. **Objective:** To assess the efficacy of zinc therapy in verruca vulgaris in our Dermatology outpatient department. **Methods:** This study was designed as a none randomized quasi experimental study including all patients above 15 years of age, who visited Skin & VD outpatient Department of Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from January to June 2022. 60 patients included in our study. Patients with mucosal warts or taking other drugs for warts or for any systemic disease for last two months to study or suffering with systemic illnesses or pregnancy and lactating were excluded for the study photographs were taken at baseline and at the outcome assessment. All patients were clinically examined thoroughly to rule out any systemic disease. Digital photographs were taken at baseline and at the outcome All data including demographic profile, clinical, response of treatment and side effects was recorded in an All patients were given Oral Zinc sulphate 10mg/kg/body weight (maximum of 600mg) daily for 3 months. Baseline investigations were carried out to rule out any systemic disease. **Results:** Total 60 patients were studied in this study. Mean years of presentation was 36 years. Commonest age group of presentation was seen between 15 and 25 years, 32(53.3%) patients (Table-1). Thirty (60%) patients were females. For the profession, 21(36%) patients were students. The difference between three months' treatment of verruca vulgaris, 16.6% had 1 month, 20.0% and 63.3%

had 2, 3 months respectively. Commonest site of presentation was seen over face in 20(33.3%) patients, followed by upper limbs 16(26.6%), scalp 8 (13.3%), soles 8 (13.3%), lower limbs 6 (10%), palms one (1.6%) and trunk 1 (1.6%). Mostly lesions were papules in 23 (38.3%) followed by papule and plaques in 18(30%), plaques in 12(20%) and combinations of nodules, papules and plaques in 7(11.6%). In about 27(45%) patients, lesions were firm, smooth in 25(41.6%) with regular margin in 32(53.3%). During follow-up of one month no improvement was seen in 13(21.6%), 25% improvement was seen in 36(60%), 50% improvement in 8 (13.3%) and 75% improvement in 3 (5%) patients. Side effects like nausea and mild abdominal pain was seen in 9 (10%) patients (See Table 2). Follow-up in two months showed 25% improvement in 30(50%), 50% improvement in 17(28.3%) and 75% improvement in 7(11.6%). Dropout rate was 1.66%. Side effect was seen in 1 (1.66%) patient who had gastrointestinal upset. Follow-up in three month showed 25% improvement in 15(25%), 50% improvement in 21(35%), 75% improvement in 16(26.6%) and 100% improvement in 4(6.66%) patients. This improvement over 3 months was statistically significant ($p< 0.05$). Age of the patients was statistically significantly associated with clinical improvement ($p<0.05$). However, there was no significant association between sex and clinical improvement. No side effects were noticed dropout rate over 3 months was 8.32%. **Conclusion:** This could possibly be due to a lower dose of zinc sulphate used in our study. This study confirms the role of oral zinc sulphate as a systemic treatment modality for viral warts with the advantage of being non-invasive, non-scarring, and having the potential of preventing recurrences.

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## INTRODUCTION

Verruca vulgaris, caused by human papilloma virus (HPV), is a common skin condition world-wide which may be transmitted through breaks in the skin or autoinoculation into adjacent skin. It ranked 10th in the top 10 diseases in 2019 seen among the training institutions of the Philippine Dermatological Society with a prevalence rate of 2.2% [1]. There are approximately 100 genotypes of these DNA viruses. Transmission of HPV occurs most commonly by direct contact with individuals who may be harboring subclinical or manifesting clinical HPV-associated lesions, or by indirect means such as through contaminated surfaces and objects. Basal keratinocytes of the epidermis which serve as primary targets for HPV infections are exposed to the virus through minor abrasions and infection is promoted by maceration of the epithelia. It presents as small hyperkeratotic proliferations which can spread and remain subclinical [2]. Recovery from the viral infection is spontaneous in majority of the cases but may take months to years. There is currently no specific antiviral therapy available to cure HPV infection. Existing modalities of treatment including electrocautery, cryotherapy which involve destruction or removal of visible lesions do not prevent recurrences and may even result in scarring. The most common treatment for warts is physical destruction of the lesion. Treatment on numerous lesions using physical

destruction, such as electrocautery, curettage, and cryotherapy is avoided by some patients due to pain, discomfort, recurrence and prolonged healing time. Moreover, the goal of physically destructive therapies is to eliminate the lesion but this does not completely eradicate the virus. Success rates of 65-85% were found with the use of electrocautery and curettage but the high recurrence rate of 30% should be considered when choosing these as treatments [3]. The cure rates for salicylic acid vary between 15-49% which is low when compared to physical destruction or immunotherapy [4]. There is inadequate trial evidence of trichloroacetic acid in the treatment of verruca. Monochloroacetic acid showed a cure rate of 61%; however, it is highly corrosive and toxic [5]. Glutaraldehyde 10% paint showed a cure rate of 71% but there were reports of deep necrosis due to repeated application. Zinc, a non-toxic trace element which has been used as an immunomodulator in various dermatological ailments such as leg ulcers, erythema nodosum leprosum (type 2 reaction) and dissecting cellulitis of scalp, has been tried in viral warts with encouraging results [6,7,8].

## MATERIALS AND METHODS

This study was designed randomized quasi experimental study including all patients above 15 years of age, who visited Skin & VD outpatient department of Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from January to June 2022. 60 patients included in our study. Patients with mucosal warts or taking other drugs for warts or for any systemic disease for last two months to study or suffering with systemic illnesses or pregnancy and lactating were excluded for the study photographs were taken at baseline and at the outcome assessment. All patients were clinically examined thoroughly to rule out any systemic disease. Digital photographs were taken at baseline and at the outcome All data including demographic profile, clinical, response of treatment and side effects was recorded in an All patients were given Oral Zinc sulphate 10mg/kg/body weight (maximum of 600mg) daily for 3 months. Baseline investigations were carried out to rule out any systemic disease.

**Inclusion criteria:**

- 18 to 50 years old, male or female, diagnosed with verrucae vulgaris, history of Bacilli Calmette Guerin vaccination, lesion count of 2-20, largest diameter of lesions between 0.1-5cm.

**Exclusion criteria:**

- Allergy to PPD and Zinc Sulfate, ongoing other treatment for warts, use of immunomodulators, chronic systemic illness, immunocompromised state, pregnant and lactating women.

Statistical analysis was done using SPSS statistical software version 16 and descriptive analysis and Friedman test was used to study the significant association. p value less than 0.05 was considered significant.

## RESULTS

A total of 60 patients were studied in this study. Mean years of presentation was 36 years. Commonest age group of presentation was seen between 15 and 25 years, 32(53.3%) patients (See table 1). Thirty (60%) patients were females. For the profession, 21(36%) patients were students, 18(32%) employed, 12(20%) were housewives, and 8(12%) unemployed. The difference between three months treatment of verruca vulgaris, 16.6% had 1 month, 20.0% and 63.3% had 2, 3 months respectively (Table-1). Commonest site of presentation was seen over face in 20(33.3%) patients, followed by upper limbs 16(26.6%), scalp 8 (13.3%), soles 8 (13.3%), lower limbs 6 (10%), palms one (1.6%) and trunk 1 (1.6%) (Table-2). Ten to twenty (10-20) lesions were seen in 22(36.6%) patients, followed by 21-30 in 18(30%), 31-40 in 15(25%), and more than 40 in 5(8.3%) patients. Size of the lesion was less than 1cm in 29(48.3%) patients, 1-5 cm in 24(40%) and

more than 5cm in 7(11.6%) patients. Mostly lesions were papules in 23 (38.3%) followed by papule and plaques in 18(30%), plaques in 12(20%) and combinations of nodules, papules and plaques in 7(11.6%). In about 27(45%) patients, lesions were firm, smooth in 25(41.6%) with regular margin in 32(53.3%). General examination of all patients were unremarkable. Laboratory tests were normal in 58(96.6%) except for two patients with urine abnormality like pus cells and positive urine albumin. They were treated accordingly before start of treatment. During follow-up of one month no improvement was seen in 13(21.6%), 25% improvement was seen in 36(60%), 50% improvement in 8 (13.3%) and 75% improvement in 3 (5%) patients. Side effects like nausea and mild abdominal pain was seen in 9 (10%) patients (See Table 2). Follow-up in two months showed 25% improvement in 30(50%), 50% improvement in 17(28.3%) and 75% improvement in 7(11.6%). Dropout rate was 1.66%. Side effect was seen in 1 (1.66%) patient who had gastrointestinal upset. Follow-up in three month showed 25% improvement in 15(25%), 50% improvement in 21(35%), 75% improvement in 16(26.6%) and 100% improvement in 4(6.66%) patients. This improvement over 3 months was statistically significant ($p< 0.05$). Age of the patients was statistically significantly associated with clinical improvement ($p<0.05$). However, there was no significant association between sex and clinical improvement. No side effects were noticed dropout rate over 3 months was 8.32% (Table-3).

**Table-1**: Age distribution of the patients (N=60)

| Patients characteristics | N | % |
|---|---|---|
| Age in yeas | | |
| 15-25 | 32 | 53.3 |
| 26-40 | 20 | 33.3 |
| 41-59 | 5 | 8.33 |
| >60 | 3 | 5.0 |
| Sex | | |
| Male | 24 | 40 |
| Female | 36 | 60 |
| Occupation | | |
| Students | 22 | 36.6 |
| Employed | 18 | 30.0 |
| Housewives | 12 | 20.0 |
| unemployed | 8 | 13.3 |
| Duration of verruca vulgaris, N (%) | | |
| 1 month | 10 | 16.6 |
| 2 months | 12 | 20.0 |
| 3 months | 38 | 63.3 |

**Table-2**: Commonest site of presentation of the verruca vulgaris (N=60)

| Lesion Site | N | % |
|---|---|---|
| Face | 20 | 33.3 |
| Upper Limbs | 16 | 26.6 |
| Scalp | 8 | 13.3 |
| Soles | 8 | 13.3 |
| Lower Limbs | 6 | 10.0 |
| Palms | 1 | 1.66 |
| Trunk | 1 | 1.66 |

**Table-3:** Follow up of patients.

| Clinical Improvement | 1 month follow up N (%) | 2 months' follow-up N (%) | 3months follow-up N (%) |
|---|---|---|---|
| None | 13 (21.6) | 5 (8.33) | 0 (0.0) |
| Mild (25%) | 36 (60.0) | 30 (50.0) | 15 (25.0) |
| Moderate (50%) | 08 (13.3) | 17 (28.3) | 21 (35.0) |
| Good (75%) | 03 (05.0) | 07 (11.6) | 16 (26.6) |
| Excellent (100%) | 0 (0.0) | 0 (0.0) | 04 (6.66) |
| Drop out | 0 (0.0) | 01 (1.66) | 04 (6.66) |

## DISCUSSION

Zinc stimulates dendritic cells and activates both the innate and adaptive immunity to clear the virus [12]. Intralesional PPD administration increases IL-12 and activates T-cells to release gamma interferon which helps to eliminate the virus [13]. Repeated injections further boost the immune response [8,9,14]. Viral warts are an extremely common benign condition caused by infection of epidermal cells with the human papillomavirus (HPV), resulting in cell proliferation. A thickened warty papule on the skin or mucous membrane is the typical clinical presentation. The most common sites involved are the hands, feet and the face. Two large population based studies found prevalence rates of 0.84% and 12.9% respectively [4,5]. In our study mean years of presentation was 36 years. Commonest age group of presentation was seen between 15 and 25 years, 32(53.3%) patients (See table 1). Thirty (60%) patients were females. For the profession, 21(36%) patients were students, 18(32%) employed, 12(20%) were housewives, and 8(12%) unemployed. The difference between three months treatment of verruca vulgaris, 16.6% had 1 month, 20.0% and 63.3% had 2, 3 months respectively (Table-1). Prevalence rates are higher in children and young adults. Studies in school population have shown prevalence rates of 12% in 4-6 years old and 24% in 16-18 years old [12,13]. The current treatment for warts involves the physical destruction of infected cells which sometimes results in scarring. Commonest site of presentation was seen over face in 20(33.3%) patients, followed by upper limbs 16(26.6%), scalp 8 (13.3%), soles 8 (13.3%), lower limbs 6 (10%), palms one (1.6%) and trunk 1 (1.6%) (Table-2). Our study ten to twenty (10-20) lesions were seen in 22(36.6%) patients, followed by 21-30 in 18(30%), 31-40 in 15(25%), and more than 40 in 5(8.3%) patients. Size of the lesion was less than 1cm in 29(48.3%) patients, 1-5 cm in 24(40%) and more than 5cm in 7(11.6%) patients. Mostly lesions were papules in 23 (38.3%) followed by papule and plaques in 18(30%), plaques in 12(20%) and combinations of nodules, papules and plaques in 7(11.6%). In about 27(45%) patients,

lesions were firm, smooth in 25(41.6%) with regular margin in 32(53.3%). General examinations of all patients were unremarkable. Follow-up in two months showed 25% improvement in 30(50%), 50% improvement in 17(28.3%) and 75% improvement in 7(11.6%). Dropout rate was 1.66%. Side effect was seen in 1 (1.66%) patient who had gastrointestinal upset. Follow-up in three month showed 25% improvement in 15(25%), 50% improvement in 21(35%), 75% improvement in 16(26.6%) and 100% improvement in 4(6.66%) patients. This improvement over 3 months was statistically significant ($p< 0.05$). Age of the patients was statistically significantly associated with clinical improvement ($p<0.05$). However, there was no significant association between sex and clinical improvement. No side effects were noticed dropout rate over 3 months was 8.32% (Table-3). Common therapeutic modalities for viral warts include cryotherapy, keratolytics, topical immunotherapy with contact sensitizer, oral cimetidine, antimitotic agents, carbon dioxide laser, electrosurgery, photodynamic therapy Intraregional injection of antigens and topical immune response modifiers. None of these modalities is universally effective [7]. Zinc is an important element that is found in every cell in the body. More than 300 enzymes in the body need zinc in order to function properly. It is also essential for the proper functioning of the immune system. In zinc deficiency, the function of the macrophages and T cells is impaired with fifty percent reduction in leucocytes and 40-70% reduction in antibody-mediated and cell-mediated immunity [15,16,17]. The addition of zinc to a culture system results in polyclonal stimulation of lymphocytes [18]. Zinc has been previously used as an immunomodulator in a number of dermatological diseases such as erythema nodosum leprosum and dissecting cellulitis of scalp [13]. Al-Gurari FT et al. used oral zinc sulphate at a dosage of 10mg/kg for a total period of two months in the treatment of viral warts with a cure rate of 87% [19]. The present study was done to find out the efficacy of oral zinc sulphate at lower doses and for a shorter duration in order to minimize side effects and to improve compliance respectively.

## CONCLUSION

This could possibly be due to a lower dose of zinc sulphate used in our study. This study confirms the role of oral zinc sulphate as a systemic treatment modality for viral warts with the advantage of being non-invasive, non-scarring, and having the potential of preventing recurrences.

**Conflict of Interest: None.**

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