

TREATMENT OF VIRAL WARTS BY INTRALESIONAL INJECTION OF ZINC SULPHATE

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Background: The aim of this study was to verify the efficacy of the intralesional injection of 2% zinc sulphate as compared to an injection of 7% hypertonic sodium chloride solution in the treatment of viral warts.

Patients and Methods: One hundred patients (53 females and 47 males) aged 4-45 years (mean±SD 19.93±7.92) and diagnosed with multiple verruca vulgaris (common warts) were the subject of the study. The duration of the viral warts ranged from 0.1-17 years (mean±SD 1.87±2.73). A total of 623 lesions were included in the study (mean±SD of lesions, 10.8±8.05). The treated number of lesions were 316 (mean±SD 4.78±5.09), with the untreated 307 lesions left as control.

Results: In 53 patients (30 females, 23 males), 173 lesions were treated with 2% zinc sulphate intralesionally, while 176 lesions were left untreated as control. The total clearance rate of the treated lesions were 98.2% within 6 weeks of follow-up (80.92% of lesions needed a single injection and showed total clearance within 2 weeks), while none of the control lesions showed any spontaneous clearance within the same period. In 47 patients (27 females, 20 males), 143 lesions were treated with 7% hypertonic sodium chloride solution intralesionally, with the remaining 131 lesions left untreated as control. Only 8.3% of treated lesions showed total clearance within 10 weeks of follow-up.

Conclusion: Two percent zinc sulphate can be recommended as a new and effective local mode of therapy of viral warts, especially for the recalcitrant form.

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Key Words: Viral warts, zinc sulphate.

Verruca vulgaris (viral warts) is a common skin problem encountered in daily practice.¹⁻⁴ There are different modalities of therapy, such as electrocautery, chemical cautery, cryotherapy and others,^{1-3,5} but there is not a single satisfactory therapy for all cases.^{1,6,7}

Zinc sulphate has been used successfully in the treatment of cutaneous leishmaniasis as intralesional injection,⁸⁻¹² and as oral therapy.¹³ Also, intralesional infiltration of cutaneous leishmaniasis, with 7% hypertonic sodium chloride solution has been used successfully.^{10,12,14-16} The aim of this study was to establish the effectiveness of an intralesional injection of 2% zinc sulphate as compared to an injection of 7% hypertonic sodium chloride solution in the treatment of viral warts.

Patients and Methods

A total of 100 patients (53 females and 47 males) with multiple verruca vulgaris (common warts) were studied.

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Their ages ranged from 4-45 years (mean±SD, 19.93±7.92). A total of 623 lesions were recorded in the 100 patients (mean±SD, 10.18±8.05 lesions per patient). The duration of disease ranged from 0.1-17 years (mean±SD, 1.87±2.73), and all patients had previously received multiple therapies without benefit. The patients were divided into two groups for intralesional therapy: group 1 was treated with intralesional 2% zinc sulphate ($ZnSO_4 \cdot 7H_2O$); and group 2 was treated with intralesional 7% hypertonic sodium chloride solution (NaCl).

In the preparation of 2% zinc sulphate, 2 g zinc sulphate powder was dissolved in 98 mL of sterile distilled water and autoclaved at 95°C. Seventy percent ethanol was used as an antiseptic agent before injection. Disposable insulin syringe was used.

Each patient had multiple warts, and some of the warts were injected while others were left as control. Each viral wart was fully covered with the solution until it blanched. The injection is given gently and not deeply into subcutaneous tissue, and acral parts like fingers and toes should be avoided.

Follow-up of patients was carried out at two-week intervals and injections were repeated according to the response of therapy, which were divided into the following four grades: grade 0, no change; grade 1, slight decrease in size; grade 2, moderate decrease in size; and grade 3,

complete clearance of lesion (grade 3 was considered a cure).

Results

Of the 623 lesions recorded in the 100 patients, 316 lesions were treated with both 2% zinc sulphate and 7% hypertonic sodium chloride solution, while the remaining 307 lesions were left untreated as control.

Result of Treated Lesions with 2% Zinc Sulphate

There were 349 lesions on 53 patients, and of these, 173 lesions were treated and 176 were left untreated as control. The 173 lesions were treated with single injection of 2% zinc sulphate, and after a two-week follow up, 140 lesions (80.92%) had totally cleared and were considered cured. Those lesions that failed with the first injection (33 lesions) received a second injection at the end of the second week. After follow-up after another two weeks, 28 lesions (84.84%) had totally cleared. A third injection was needed for the remaining five lesions, two of which were cured, but the rest failed at the end of six weeks. Thus, the total clearance rate for all treated lesions was 170 (98.2%), while the failure rate was three lesions (1.73%). In the follow-up, no new lesion had appeared at the site of the cured lesions (Table 1). The 176 lesions which were left untreated as control showed no spontaneous clearance at the end of a 6-week follow up.

Side Effects

All patients complained of pain during injection, and 2% xylocaine was added to the solution when necessary. All treated lesions showed redness, tenderness, swelling and development of a scab 3-7 days after injection. All patients had post-inflammatory hyperpigmentation after total clearance of lesions. Only two patients had cigarette paper-like scar, probably because their lesions were large and needed more infiltration.

Result of Treated Lesions with Hypertonic Sodium Chloride Solution

Of the 274 lesions from 47 patients, 143 were treated and 131 lesions were left untreated as control. The 143 lesions were each treated with a single injection of 7% hypertonic sodium chloride solution. After a two-week follow-up, only seven lesions (4.89%) had totally cleared. A total of 136 lesions failed with the first injection, and were given a second injection at the end of the second week. Follow-up after another two weeks showed that four lesions had totally cleared.

The remaining 122 lesions received a third injection at the end of the fourth week, and none showed improvement. Fifty-six lesions received a fourth injection at the end of six weeks, and only one lesion (1.7%) showed complete clearance. Twenty-seven lesions received a fifth injection at the end of eight weeks and none showed any response. Thus,

TABLE 1. The number of lesions treated with 2% zinc sulphate.

No. of injection	Cumulative period of follow-up	Treated lesions	Cured* Lesions	Non-cured lesions
1	2 weeks	173	140 80.92%	33 19.07%
2	4 weeks	33	28 84.84%	5 15.15%
3	6 weeks	5	2 40%	3 60%

*Cure rate 98.2%; failure rate 1.73%.

TABLE 2. The number of lesions treated with 7% hypertonic sodium chloride solution.

No. of injection	Cumulative period of follow-up	Treated lesions	Cured* Lesions	Non-cured lesions
1	2 weeks	143	7 4.84%	136 95.1%
2	4 weeks	136	4 2.94%	132 97.05%
3	6 weeks	122	–	122 100%
4	8 weeks	56	1 1.7%	55 98.2%
5	10 weeks	27	–	27 100%

*Cure rate 8.39%; failure rate 91.6%.

the total clearance rate for all the treated lesions was 8.39% (12 lesions), while the failure rate was 91.6% (131 lesions). In the follow-up, the appearance of new lesions on the cured site of three lesions was observed. Regarding the 131 lesions which were left untreated as control, none showed clearance at the end of this study except one lesion.

Side Effects

The injection with 7% hypertonic sodium chloride solution was less painful than that of the 2% zinc sulphate solution. The injection with sodium chloride solution produced post-inflammation and hyperpigmentation similar to that of the zinc sulphate, but did not leave scars.

Discussion

Although spontaneous recovery from verruca vulgaris is high, it usually takes a long time, sometime lasting for years.^{1-3,5,17} There are many modalities of therapy, but most of them take months, and might also cause scarring.^{1-5,17} Whatever method is used, there are failures as well as recurrence of the lesion.³ Common warts are common benign lesions for which no specific antiviral treatment is available.^{1,6,7}

The outcome of the present study with 2% zinc sulphate was very encouraging, as the cure rate was 98.2% and most of them (80.92%) needed just a single injection. The side effects of this treatment were just local pain, swelling and hyperpigmentation. The solution should not be injected deep in the subcutaneous tissue, and the acral parts such as fingers and toes should be avoided as they might cause necrosis, which is similar to the side effects of local injection of bleomycin.^{3,5,18-22} In our study, no patient had relapse at site of the cured lesions.

The mechanism of action of zinc sulphate in viral warts cannot be speculated but is probably similar to the action of zinc sulphate in cutaneous leishmaniasis^{8-10,12} and bleomycin

on viral warts, as both induce necrosis and inflammation.^{1,18,23,24}

The mechanism of action of 7% hypertonic sodium chloride solution in cutaneous leishmaniasis was through its hypertonic effect of inducing change in osmosis, thus killing the parasite and lesions,^{10,12,14-16} while 2% zinc sulphate probably has a direct effect on the parasite, and inducing necrosis and inflammation in the lesional tissue rather than through osmosis.^{8,10,12,13} The hypertonic sodium chloride solution showed a very low cure rate (8.2%), since the viruses shield themselves inside keratinocytes which are more resistant to the osmotic changes.

In conclusion, this study provides details of a new effective local therapy for viral warts with a high cure rate (98.2%). A recent study has been carried out using oral zinc sulphate in treating recalcitrant viral warts and which gave a high cure rate.²⁵

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