

## Comparative Study between Oral Zinc Sulphate versus Electrocautery in Treatment of Patients with Recurrent Warts

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### ABSTRACT

**Background:** viral warts are benign proliferations of the skin and mucosa that are caused by HPV infection. They consider common and major health problem. Zinc can be a therapeutic option by medulating the immune system in patients with viral warts.

**Objective:** the aim of this work was to compare the effect of oral zinc sulfate versus electrocautery in treatment of patients with recurrent warts.

**Patients and Methods:** this study was carried on 90 patients with common warts. The patients were divided into three groups (A, B, C) of 30 patients. Group A consisted of 30 patients treated with oral zinc sulfate, 30 patients in group B treated by electrocautery while group C was given placebo in the form of starch capsules.

**Results:** our results showed more improvement in group of electrocautery than in the group of zinc sulphate, and showed increase in complications in electrocautery group with statistically significant difference. In this study there was a positive correlation between percentage of improvement and serum level of zinc with a significance increase in the serum zinc level before and after treatment in zinc sulphate group.

**Conclusion:** this study showed that the role of oral zinc sulphate as a systemic treatment modality for common warts could have the advantage of being non-invasive, non scarring and with minimal side effects, but it was not very effective so it can be taken with other modalities of treatment and not as monotherapy.

**Keywords:** Oral Zinc Sulphate versus Electrocautery, HPV, Warts

### INTRODUCTION

Warts are benign proliferations of skin and mucosa that results from infection with human papilloma viruses (HPVs) <sup>(1)</sup>. HPVs are members of genus family papovaviruses, which are small double stranded DNA viruses that replicate inside the nucleus <sup>(2)</sup>.

Warts are one of the most common diseases seen in the dermatology clinics. The role of immune system in determining the outcome of HPV infection is well documented<sup>(3)</sup>.

Adequate intake of zinc is required for any rapidly dividing cell particularly those of the immune system to function efficiently, and its deficiency compromises the function of immune cells, especially T cell function. Zinc deficiency leads to a decreased number of T cells and disruption of their function, including a shift of the T-helper (Th1) cell response to Th2 predominance <sup>(4)</sup>.

Zinc also results in reduced killing activity in natural killer (NK) cells <sup>(5)</sup>. Neutrophil count is reduced and their recruitment is diminished during zinc deficiency <sup>(6)</sup>.

Zinc sulphate has been used orally and topically and also intralesionally for the treatment of warts in some clinical trials with favorable results considering the role of zinc in immune function and the efficacy of zinc sulphate in wart resolution, estimation of zinc level in patients with warts might be of value <sup>(7)</sup>.

Destructive therapy targets to damage or remove lesion, rather than aiming to eradicate the

pathogen. The options range from surgical excision, cautery, curettage, cryotherapy to laser application <sup>(8)</sup>.

An electric current can deliver quite a lot of heat energy and it is this heat which used to remove warts in electrosurgery. A metal probe with a current is applied to the warts with effectively burns it off, heat has powerful effect on living tissues, drying them out and denaturing important proteins and other structures to kill of unwanted cells. Because of this mechanism, it is an extremely effective method with warts <sup>(9)</sup>.

### AIM OF THE WORK

The aim of this work is to compare the effect of oral zinc sulfate versus electrocautery in treatment of patients with recurrent warts.

### PATIENTS AND METHODS

This study was conducted on 90 patients with common warts. The patients were collected from the Out-patient Clinics of Dermatology and Venereology Department, Kafr El-Dawar Hospital.

#### *Inclusion criteria*

Patients suitable for participation were:

1. Individuals with common warts with a history of recurrence.
2. Individuals of both sexes.

#### *Exclusion criteria*

1. Subjects with acute infections or systemic diseases.
2. Patients on any immunomodulatory medications or with immunosuppressive disease.

3. Patients with compromised wound healing, DM, peripheral neuropathy and peripheral arterial or venous disease.
4. Pregnancy and lactation.
5. Patients who had absolute contraindication for local anesthesia.

**Ethical considerations**

The study was approved by the Ethics Board of Al-Azhar University. A written informed consent from every patient was obtained before procedure. Every participant had a code number. Photos were taken to the diseased part only. All the records were confidential.

**Methods**

The patients were divided into three groups (A, B, C) of 30 patients:

- **Group A:** was treated by oral zinc sulfate.
- **Group B:** was treated by electrocautery.
- **Group C:** was given a placebo in the form of starch capsules.

**All patients were subjected to:**

1. Complete history taking.
2. Thorough general and dermatological clinical examinations.
3. Clinical assessment of warts including: number, location, duration of the disease, types and duration of previous treatments.
4. Collection of venous blood sample for measurement of serum zinc level before and after treatment for patients of group A and group C.
  - Sample volume: 4ml of whole blood.
  - Method of blood sampling: venipuncture method.
  - Type of tube: Z-serum clot activator 13x75 Vacuette tube, Manufactured by Greiner bio-one GmbH, Made in Austria.
  - Type of sample processed: serum.
  - Device: Modular Hitachi-Roche®; full automated analytical device.
5. The percent of improvement of the cases was classified into excellent >75%, moderate <75-50%, mild <50% and no change.

**Therapy:**

- **Group A:** patients were treated by oral zinc sulfate at a dose of **10mg/Kg/day** for 12 weeks.
- **Group B:** patients were treated by electrocautery. The warts and the area around it was cleaned by antiseptic; Then local anesthesia (Lidocaine Hcl 2%, 20mg/ml) was injected subcutaneously and electrocautery was done.
- **Group C:** patients were given a placebo in the form of starch capsules.

**Follow up:**

1. The duration of the study was six months. The patients were followed up during and 12 weeks after the end of the last treatment to assess any recurrence or side effects.
2. Photographs were taken before starting therapy and at every visit (monthly) and at the end of therapy.

**Statistical analysis:**

Statistical analysis was carried out using SPSS statistics software version 23. Quantitative data were tested for normality using Kolmogorov-Smirnov test. The studied variables were normally distributed, so they were described by mean, and standard deviation. Qualitative data was expressed by numbers and percent.

The following are used in statistical analysis:

1. Arithmetic mean (X).
2. Standard deviation (S.D).
3. Chi-square (X<sup>2</sup>).
4. One way: Analysis of Variance (ANOVA).  
The probability "P value ≤0.05"

**RESULTS**

Group A consisted of 30 patients treated with oral zinc sulfate, 30 patients in group B treated by electrocautery while group C was given a placebo in the form of starch capsules.

There was no statistical significance difference (p=.186) between the three groups according to demographic characteristics as illustrated in table 1.

**Table (1):** Comparison between the three groups according to demographic characteristics

Gender	Group A (N=30)		Group B (N=30)		Group C (N=30)		Test of significance (p)
	No.	%	No.	%	No.	%	
Male	17	56.7	16	53.3	14	46.7	P=.186
Female	13	43.3	14	46.7	16	53.3	
Age/(years) Mean ± SD	31.8± 15.4		28.6±11.7		25.3±12.9		

There was no statistical significance difference (p=.511) between the three groups as regards duration of disease as illustrated in table 2.

**Table (2):** Comparison between three groups according to duration of disease

	Group A (N=30)	Group B (N=30)	Group C (N=30)	Test of significance (p)
Duration of disease (months) Mean± SD	10.5± 5.6	9.6 ± 4.9	11.6 ± 8.3	(p=.511)

There was no statistical significance difference between the three groups as regards number of warts (P=.382), as illustrated in table 2.

**Table (3):** Comparison between the three groups according to number of warts

No. of warts	Group A (N=30)		Group B (N=30)		Group C (N=30)		Test of significance (p)
	No.	%	No.	%	No.	%	
(1-3)	9	30	12	40	8	26.7	(P= .382)
(4-6)	8	26.7	12	40	8	26.7	
>6	13	43.3	6	20	14	46.6	
<b>Total</b>	30	100	30	100	30	100	

There was no statistical significance difference (p value >.05) between the three groups as regards site of warts as illustrated in table 4.

**Table (4):** Comparison between the three groups according to site of warts

Site of warts	Group A (N=30)		Group B (N=30)		Group C (N=30)		Test of significance (p)
	No.	%	No.	%	No.	%	
Head& Neck	5	16.7	6	20	6	20	(P= .930)
Limbs	25	83.3	24	80	24	80	
<b>Total</b>	30	100	30	100	30	100	

There was statistical significance difference (p=.002) between the three groups as regards percent of improvement as illustrated in table 5.

**Table (5):** Comparison between the three groups according to percent of improvement

Percent of improvement	Group A (N=30)		Group B (N=30)		Group C (N=30)		Test of significance (p)
	No.	%	No.	%	No.	%	
No change	11	36.7	8	26.7	27	90	(P= .002*)
Mild	7	23.3	0	0	3	10	
Moderate	5	16.7	0	0	0	0	
Excellent	7	23.3	22	73.3	0	0	
<b>Total</b>	30	100	30	100	30	100	

\*: statistically significant

# p1 significance between group A and group B = .0002\*, P2: significance between group B and group C =.0001\*, p3: significance between group A and group C = .0001\*

There was statistical significance difference (p<.0001\*) between the three groups as regards side effect and complications as group B recorded highest percentage in side effects scarring and recurrence in 8 cases ; 26.7% while groups A and C showed no side effects detected as illustrated in table 6.

**Table (6):** Comparison between the three groups according to side effects and complications

Scarring and recurrence	Group A (N=30)		Group B (N=30)		Group C (N=30)		Test of significance (p)
	No.	%	No.	%	No.	%	
Positive	0	0	8	26.7	0	0	(P<.0001*)
Negative	30	100	22	73.3	30	100	

\*: statistically significant.

# p1 significance between group A and group B = .007\*, P2: significance between group B and group C =.007\*, p3: significance between group A and group C = .9

There was positive significant correlation ( $p < .001$ ) between percent of improvement and serum zinc level as illustrated in table 7.

**Table (7):** Correlation between percent of improvement and serum zinc level

Group A		Percent of improvement	Serum zinc level ( $\mu\text{g/dl}$ ) (N=30)
Percent of Improvement	Spearman Correlation (r)	1	.586
	P		.001*

\*: statistically significant

There was significant difference ( $p < .0001$ ) in serum zinc level before and after treatment in group A, while there was no significant difference ( $P = .008$ ) in serum zinc level before and after treatment in group C as illustrated in table 8.

**Table (8):** Comparison between groups A and C according to serum zinc level before and after treatment

	Serum zinc level before treatment ( $\mu\text{g/dl}$ )	Serum zinc level after treatment ( $\mu\text{g/dl}$ )	Test of significance (p)
Group A (N=30) Mean $\pm$ SD	77.01 $\pm$ 24.9	103.9 $\pm$ 23.2	( $P < .0001$ *)
Group C (N=30) Mean $\pm$ SD	77.01 $\pm$ 24.9	76.01 $\pm$ 24.5	( $P = .08$ )

\*: statistically significant

## DISCUSSION

Our results showed no statistical significance difference between the groups of the study regarding age and sex.

In our study we found no statistical significance difference between groups of the study regarding to the duration of disease, number and sites of warts.

**Withey et al.** <sup>(10)</sup> found in their study that there was no significant difference between group A patients were given oral zinc sulphate and group B who received gluocose tablets as placebo regarding age, gender and number of warts which was in agreement with our study.

**Abd El-Raheem et al.** <sup>(11)</sup> found in their study that there was no significant difference between the group who received oral zinc sulphate and the group who received oral placebo regarding to age, gender, duration of the disease and number of warts which run in line with the result of our results.

Our results showed significant improvement in the group of electrocautery than zine sulphate group and both groups showed significant improvement than placebo group.

In agreement with our study **Mariane et al.** <sup>(12)</sup> observed that there was significant difference in the proportion of clinical response between their two studied groups. The group treated with zinc sulphate had proportion of complete response significantly higher than the placebo group.

In agreement with our study **Khalifa et al.** <sup>(13)</sup> found that, zinc sulphate has been used successfully in the treatment of common warts and genital warts orally, and intralesionally in recalcitrant common warts.

**García et al.** <sup>(14)</sup> found in their study that there was no significant difference in the percentage of improvement between the use of oral zinc sulphate and the placebo group which was conflicting with the results of our study.

In disagreement with our study **Moubasher et al.** <sup>(15)</sup> they showed that, there were no statistical significant differences between group that received Zinc and placebo group regarding treatment of warts.

Our results showed no significant correlation between percent of improvement in groups of electrocautery and zinc sulphate regarding age, duration of disease, site and number of warts.

**Moniem et al.** <sup>(16)</sup> showed in their study that there was no statistical significant differences regarding age and number of warts in relation to percent of improvement between group I ( took oral zinc sulfate for one month ) and group II (placebo group) which was in agreement with our results. On the other hand, short duration of the disease was associated with better response on the percent of improvement in group I.

Our study found that there was a significant increase in the improvement percentage with increase in the serum level of zinc. **Moniem et al.** <sup>(16)</sup> showed in their study that the serum level of zinc was significantly increased in the percentage of improvement in group I "treated by oral zinc sulphate" than in group II "placebo group" which was in agreement with our results.

There was significance increase in the serum zinc level before and after treatment in zinc sulphate group while there was no significance change in the serum zinc in the placebo group before and after treatment. **Moniem et al.** <sup>(16)</sup> showed in their study that the serum

level of zinc was significantly increased after therapy compared with that before treatment in group I "treated by oral zinc sulphate" than in group II "placebo group" which was in agreement with our results.

Regarding side effects only mild epigastric pain (6%) was observed in our patients who did not require interruption of treatment. On the other hand in a study by **Stefani et al.** <sup>(17)</sup> adverse effects reported by the patients treated with zinc sulfate were nausea, vomiting and diarrhea.

## CONCLUSION

This study showed that the role of oral zinc sulphate as a systemic treatment modality for common warts could have the advantage of being non-invasive, non scarring and with minimal side effects, but it was not very effective so it can be taken with other modalities of treatment and not as monotherapy.

## RECOMMENDATIONS

Further studies are needed for evaluation of the effectiveness of oral zinc sulphate in the treatment of different types of warts and to study the effect of topical zinc sulphate in treatment of warts.

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