ORAL ZINC SULPHATE THERAPY FOR ACNE VULGARIS

K. Weismann, S. Wadskov and J. Sondergaard

From the Departments of Dermatology, Rigs Hosspital and Hvidovre Hospital, University of Copenhagen, Denmark

Abstract. A double-blind controlled clinical trial was performed to evaluate the effect of oral zinc sulphate, 0.6 g daily, on acne vulgaris. Twenty patients received zinc sulphate tablets and 19 were given placebo tablets. Thirteen of the zinc group and 12 of the placebo group received their medication throughout a 12-week period, while the remaining patients were treated for 4 or 8 weeks. In all patients the numbers of papular and pustular acne lesions on the face and the back were significantly reduced, while larger infiltrates remained practically unaltered during the trial, which was performed from March through May 1975. No statistically significant difference in the improvement of the groups was demonstrable. Pre-treatment serum zinc values, which were normal in all patients, rose significantly in the zinc group as well as in the control group, but the increase in the former was significantly higher. The negative therapeutic results might be attributable to the limited number of patients or related to the zinc dosage. Furthermore, the results might have been influenced by the unexplained rise in serum zinc values in the control group. A possible weak beneficial effect of zinc might also have been camouflaged by the seasonal variation in the severity of acne which was noted in this study.

Key words: Acne vulgaris; Zinc sulphate; Zinc therapy

New principles for treatment of acne are currently being investigated throughout the world. Unfortunately, however, few prove to be effective. Oral zinc therapy might be an alternative effective principle (4). In acrodematitis enteropathica (1, 3, 5, 7, 8) and in zinc deficiency, caused by long-term parenteral nutrition (2, 9), the inflammatory skin changes, including acneiform eruptions and seborrheic lesions on the face, disappear promptly when the patients receive systemic treatment with zinc. In a double-blind controlled clinical trial we have therefore attempted to evaluate the effect of oral zinc sulphate in acne vulgaris.

MATERIAL AND METHODS

Thirty-nine volunteer patients (30 males and 9 females) suffering from acne vulgaris were included in the study. The mean age in the male group was 22 years (range 17-33 years), and 24 years (range 17-37 years) in the female group. Only patients who had not been treated with tetracycline, topical vitamin A acid or benzoyl peroxide preparations were accepted for the trial, and a minimum of 15 papular or pustular acne lesions on the face was required. The study was performed during March, April and May 1975.

Treatment with zinc sulphate or placebo was performed as a randomized double-blind trial. Zinc sulphate (Solvezink®, AB Tika, Lund, Sweden) was given as effervescent tablets of 0.2 g ZnSO₄·7H₂O (≈45 mg Zn²⁺), and for placebo, lactose tablets of identical appearance and taste were used. The patients were instructed to ingest one tablet dissolved in a glass of water three times daily immediately after the meals. No other treatment was permitted and sunbathing was prohibited during the trial. At each control visit to the clinic 2, 4, 8 and 12 weeks later, the remaining tablets were counted to ensure that the medication had been taken as prescribed.

Serum zinc was determined in each patient before and after 4 and 12 weeks of treatment. The blood samples were taken between noon and 3 p.m., the patients having been fasting for at least 5 hours. Special zinc-free glasses were used and care was taken to minimize the risk of contamination. The zinc analyses were performed by Medicinsk laboratorium A/S, Copenhagen, using atomic absorption spectrophotometry.

The number of papules (elevated infiltrated lesions less than 5 mm in diameter), pustules (lesions less than 5 mm, containing visible pus) and infiltrates (indurated or cystic lesions larger than 5 mm in diameter) were counted at each visit, always by the same clinician. Comedones were not counted. Only acne lesions in well-defined regions were recorded, which included the face and the back. The face region was defined as the area limited by the border of the scalp and two lines drawn from the distal part of the right and left mastoid processes to the anterior edge of the sternocleidomastoid muscles, joining a horizontal line at the level of the laryngeal prominence. The test area on the
Table 1. Results of oral zinc sulphate and placebo treatment in acne vulgaris

Left: for each of the acne lesions in the zinc group and the placebo group: n = number of patients; \( \bar{x} \) = mean number of lesions; S.D. = standard deviation. Right: the changes from the initial values to those after 4, 8, and 12 weeks are evaluated by means of Wilcoxon's signed rank sum test: n = number of patients showing a change; RS = sum of signed ranks; p = probability value; n.s. = not significant (p > 0.05)

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back was limited by two vertical lines at the right and left posterior axillary folds and two horizontal lines through the vertebral prominens and the inferior scapular angles.

Clinical photos were obtained before and at the end of the trial under standardized photographic conditions to facilitate comparison. The overall clinical effect of the treatment was evaluated at each visit both by the patient and the clinician.

The results were statistically analysed by Wilcoxon’s rank sum test and Student’s t-test.

RESULTS

By the end of the trial when the code was broken, 20 patients (15 males and 5 females) were found to have received treatment with zinc sulphate and 19 patients (15 males and 4 females) had received the placebo. Thirteen patients of the zinc group and 12 of the control group received the medication throughout the 12-week period, while the remaining patients were treated for 4 or 8 weeks (Table 1). The only patients who were excluded after 4 or 8 weeks were those who did not turn up for control or failed to take the tablets as prescribed.

In the placebo group and the zinc-treated group a clinical improvement of acne was noted by the clinicians and the patients during the trial. With a single exception the numbers of papules and pustules were significantly reduced after 4, 8 and 12 weeks, whereas the number of infiltrates was unaltered in the two groups, apart from a significant decrease after 8 weeks in the control group (Table 1). There was, however, no statistically significant difference between the groups in the reduction of papules, pustules or infiltrates when compared with the control group (p > 0.05, Wilcoxon’s rank sum test). No significant difference was found in the number of acne lesions in the two groups before the trial (p > 0.05, Wilcoxon’s rank sum test).

After 4 weeks, serum zinc levels in the zinc-treated group rose from 13.05±1.87 \( \mu \text{mol/l} \) (mean ± S.D.) to 17.75±3.04 \( \mu \text{mol/l} \). At the end of the trial the value was 18.15±4.49 \( \mu \text{mol/l} \). The levels after 4 and 12 weeks were significantly higher than the initial serum zinc concentrations (p < 0.001, Student’s t-test). At the beginning of the trial, serum zinc was 13.58±1.46 \( \mu \text{mol/l} \) in the control group. After 4 weeks the mean value was 14.33±1.53 \( \mu \text{mol/l} \), and after 12 weeks 15.39±2.12 \( \mu \text{mol/l} \). These values are significantly higher than the pretreatment values (p < 0.05 after 4 and 12 weeks, Student’s t-test). However, the increase in serum zinc after 4 and 12 weeks was significantly higher in the zinc-treated group than in the control group (p < 0.001 and p < 0.05, respectively, Student’s t-test). In Medicinsk laboratorium A/S the normal range of serum zinc is 10.6–17.7 \( \mu \text{mol/l} \) (females) and 11.4–18.9 \( \mu \text{mol/l} \) (males) (10).

Side effects were recorded in 3 patients receiving zinc. All had nausea, in one case followed by vomiting, within a quarter of an hour after ingestion of the tablets. Because of this, the treatment was stopped in 2 patients; in 3 the medication was continued as the discomfort soon disappeared.

DISCUSSION

The results show that oral 0.6 g daily did not alleviate the number of patients included in the study, but there was a reduction in the number of papules and pustules was observed in 12 months with zinc when the group of acne patients given the effect of zinc could not be controlled at each visit by tablets and, at the end of the trial, a significant rise in serum zinc failure to be attributed to the two groups were properly classified; nor could it be classified. Two clinicians, different results even by classification. In this study, included, as each patient was seen by the same clinician.

The therapeutic failure of the dosage of zinc which of serum zinc to about the rise in serum zinc level remains unexplained, but alterations in zinc metabolism found a marked elevation in human hair during the study, suggest a connection between zinc metabolism and remission.
no statistically significant group differences when compared with the controls. The mean cortisol levels at 0.6 mg/kg were found to be similar in the two groups before the treatment was stopped. After ingestion of the treatment, the cortisol levels increased significantly in the experimental group (mean cortisol levels were 11.95 ± 11.33 μg/ml). At the end of the trial period, the difference was still significant (p < 0.01). The cortisol levels remained significantly lower in the control group (mean cortisol levels were 8.0 ± 8.7 μg/ml). The levels after 4 and 12 weeks were significantly higher than the pre-treatment levels in the control group (mean cortisol levels were 13.0 ± 13.6 μg/ml). The difference was significant at the 0.05 level (p < 0.01). The cortisol levels remained significantly lower in the control group (mean cortisol levels were 8.0 ± 8.7 μg/ml).

**DISCUSSION**

The results show that oral zinc sulphate decreases the activity of the enzyme. This suggests that the reduction in cortisol is the result of a decreased activity of the enzyme. It seems likely that the decrease in cortisol is due to a decrease in the activity of the enzyme. The different results may be due to an improper handling of the patients. Further studies are needed to clarify the mechanism of the decrease in cortisol.

**REFERENCES**


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K. Weismann, M.D.
Department of Dermatology
Rigshospitalet
Blegdamsvej 9
DK-2100 Copenhagen
Denmark

Abstract. Dextran polymer (Dextran 70®) was used in the treatment of 10 non-venerial penile ulcers. They were caused by herpes infection, occlusion of the urethra, or unknown cause and were resistant to conventional treatment. Two of the patients were diabetics.

Key words: Penile ulcers; Testosterone; Dextran 70®; Dextran

Genital ulcers, especially penile ulcers, are a frequent problem both in general medical practice and for the venereologist. They usually are seen in men and can be caused by herpes infection, occlusion of the urethra, or unknown causes. In the past, genital ulcers were thought to be caused by venereal diseases like syphilis, lymphogranuloma venereum, or other sexually transmitted diseases. It is now known that genital ulcers can be caused by a variety of factors, including potent corticosteroids like hydrocortisone, and potent corticosteroids like hydrocortisone.

Whatever the etiology of the ulcer is, the condition improves with treatment. Systemic antibiotic treatment is often effective and usually has a dramatic effect and consequently prevents the recurrence of the ulcer. Topical antiseptic solutions, powders, and ointments are usually poor.

Recently, a very helpful agent has been found to be highly efficacious in treating genital ulcers. This agent is Dextran 70® (generic name: dextran 70®). The mechanism of action of Dextran 70® is not well understood, but it is believed to act by forming a protective barrier on the ulcer surface, thus preventing further damage and promoting healing. In addition, Dextran 70® is known to have anti-inflammatory and anti-inflammatory properties, which may contribute to its efficacy in treating genital ulcers.