

Evaluation of the Therapeutic Effects of Zinc Sulfate in Patients with Geographic Tongue

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ABSTRACT

Statement of the problem: Geographic tongue is characterized by loss of filiform papillae in an erythematous area with keratotic borders. It vanishes after a while and reappears in another area. It is relatively common and is most seen among females. Considering such problems as pain, burning sensation and sharp pain in tongue, decreasing of taste sensation, cancer phobia and esthetic problems it needs to be treated.

Purpose: The aim of this study was to determine the therapeutic effect of zinc sulfate in patients with geographic tongue.

Materials and Methods: Randomized-controlled study with two parallel treatment groups was performed to evaluate the efficacy of zinc sulfate in treatment of geographic tongue. After a pilot study, the number of patients was estimated to be 40. Twenty patients were assigned to the experiment group with zinc sulfate therapy and 20 patients were assigned to the control group that took placebo. Patients with symptomatic or asymptomatic geographic tongue were included in this study. Since zinc sulfate has been categorized as group C, pregnant women were excluded from our study. Randomized double blind method of sampling was applied. A questionnaire regarding personal background of patients, along with a complete history of the present geographic tongue was filled for the patients on the day of entering the study and also on the 10th day after beginning the therapy. Healing was defined as complete resolving of tongue lesions. On the 10th day, the effect of treatment was assessed by the examiner. The data were analyzed using Chi-square test.

Results: In 16 of the 20 patients in the experimental group signs of healing were found as well as 3 of the 20 patients in the control group. The data were analyzed using Chi-square test.

Conclusion: The role of zinc in maintaining healthy epithelial tissues, renewing of filiform papillae and the positive effect of zinc sulfate in treatment of geographic tongue were clearly observed.

Key words: Geographic Tongue, Placebo, Zinc Sulfate.

INTRODUCTION

Geographic tongue is characterized by loss of filiform papillae in an erythematous area with keratotic border. It is vanished after a while and appears in another area. It is relatively common and is most seen among females.⁽¹⁾ Considering such problems as pain, burning sensation and sharp pain in tongue,⁽²⁾ decreasing of taste sensation,

cancer phobia⁽³⁾ and esthetic problems it needs to be treated. The exact etiology is not clear but in numerous investigations a number of possible causes have been suggested⁽⁴⁻⁹⁾ such as vitamin deficiency,⁽⁵⁾ emotional stress, fungal and bacterial infections and allergic reactions.^(5,10) Coincidences of this lesion with diseases such as psoriasis, dermatitis, Reiter's syndrome have been reported.^(11,12) HLA B-15 antigen is common in patients with geographic tongue.⁽¹⁰⁾ Sensitivity to environmental factors, genetic factors, familial pattern and abnormal developmental conditions had been considered.^(4,10) Zinc

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deficiency is another related factor.⁽¹³⁾ The role of zinc in healing of ulcers and maintaining healthy epithelial tissues has been documented. Zinc is needed for functioning of more than a hundred of enzymes in the body⁽¹⁵⁾ and is also necessary for synthesis of proteins and nucleic acids.⁽¹⁶⁾ It is essential for normal development and growth of genital organs.⁽¹⁷⁾ Also it is very crucial in healing of burning ulcers.^(18,19) Zinc sulfate is classified in the group of mineral medications and is available in the form of 220 mg capsules. The prescribed dose for geographic tongue is about 200-220 mg once a day which was taken orally.⁽²⁰⁾ Considering the above-mentioned facts, we decided to evaluate the therapeutic effects of zinc sulfate in patients with geographic tongue and compare the rate of healing in two groups of patients taking zinc sulfate and placebo.

MATERIAL & METHODS

This study was a double blind randomized clinical trial. Patients referring to Hamadan dental faculty during a one year period from 2003 to 2004 were evaluated. To determine the sample size, a pilot study was carried out for 10 patients in experimental group and 10 in control group. Then 40 patients (20 as the control group & 20 as the experimental group) were selected. The patients diagnosed to have geographic tongue were included in this study, regardless that the lesions were symptomatic or asymptomatic. The lesions with pain, burning sensation, sensitivity to palpation, metal taste, and sensitivity to stimulating foods such as tomato, egg and spices were described as symptomatic. The control group was matched for sex, age, clinical features, inclusion and exclusion criteria. After verifying the presence of geographic tongue in each patient, a questionnaire containing questions regarding individual information, medical history, dental history and especially an exact history of geographic tongue was completed and a slide was taken then again 10 days after taking zinc or placebo. As zinc sulfate is classified in group C drug, pregnant

women were not included in the study. Zinc sulfate was given in the form of 220 mg capsules for patients in the experimental group to be taken once a day after lunch for 10 days. The placebo was prepared by the staff of a pharmacy using a digital scale for weighting, in order to increase the accuracy of the study and to create a high level of similarity between the drug and the placebo. We also evaluated the intensity of patients' tongue pain before and after treatment using VAS (Visual Analogue Scale).⁽²⁾ Ten days later the patients were examined again regarding to healing. Healing was defined as complete resolving of lesion. Hence, the patients were categorized into two groups: healed and not healed. Finally, clinical judgment of the examiner was used as the criterion for evaluating the rate of healing.

RESULTS

Forty patients (12 males and 28 females) were studied. The results indicated that 16 of the 20 patients taking zinc sulfate showed an 80% cure rate. In three of the 20 patients taking placebo the cure rate was reported as 15%. In general, in 19 out of 40 patients (47.5%) the lesions were solved (Table 1). Thirty eight patients (95%) were aware of the lesion on their tongue. In 12 patients (30%) signs and symptoms such as pain, partial loss of taste sensation were observed. Twelve patients (30%) had consulted with a physician before referring. Eleven patients (27.5%) had taken another drug other than zinc sulfate before entering in this study. Four of the 11 patients taken a drug other than Zinc Sulfate (3.36%) reported healing signs. Nineteen patients (47.5%) reported one or more factors that made more severe the lesion. Three patients (7.5%) reported one or more factors that had improved their condition. Seventeen patients (42.5%) reported decreasing of size and severity of signs. Thirteen patients (32.5%) reported the existence of geographic tongue in other family members or close relatives. Finally in this survey, 17 patients (42.5%) reported stressful conditions in their daily life.

Table 1: Comparison of healing in patients with geographic tongue

Study groups	Healing n (%)	Not Healing n (%)	Total n (%)	P
Zinc Sulfate	16 (80)	4 (20)	20 (100)	0.00
Placebo	3 (15)	17 (85)	20 (100)	0.00
Total	19 (47.5)	21 (52.5)	40 (100)	0.00

DISCUSSION

Geographic tongue is one of the most common lesions which is often seen on the dorsal surface and lateral borders of the tongue. Sometimes the involved surface is so extensive that it causes esthetic problems for patients. When the lesion persists and lasts for several years, it causes cancer phobia. The exact cause and real etiology of this lesion haven't yet been understood and combinations of possible causes have been considered. Factors such as emotional stress, nutritional deficiencies, allergy, genetic, immune deficiency and systemic diseases such as diabetes mellitus, have been suggested. The role of zinc as an essential factor for epithelial tissue health has been proven in many studies. Hence, there has been some speculation on the point that prescription of zinc in patients with geographic tongue can cause healing and the minimum dose was selected to avoid any toxic effect. We cannot certainly state that low levels of serum zinc in patients is the main cause of the lesion, but it can be said that prescription of zinc sulfate can eliminate its symptoms regardless of the etiology of the lesion.

In our study, the role of zinc sulfate on geographic tongue healing was proven on the basis of the results indicating healing in 80% of patients. On the other hand, healing was observed only in 15% of patients, who had taken placebo, which can be considered as another proof of the proposed theory.

Al. Naief and Ashrafi investigated the relation between zinc deficient diets and concentration of epithelial coated granules in rat. It was shown that in 18 rats who had been grown up with 0.4-0.5 ppm zinc in their daily diet, normal orthokeratinized epithelium was changed to parakeratinized after 9 days; in comparison with 18 rats with 40 ppm zinc in

their diet.^(21,22) In another study that was performed by Dr.Gerson et al. on the effect of zinc deficiency on the buccal epithelium keratin of rats, it was seen that in experimental rat group receiving less than 1 ppm zinc, keratin layer of buccal epithelium had been destroyed.⁽²³⁻²⁵⁾ Dr. Charles had done an investigation on 16 rabbits with zinc deficient diets (1.5 mg zinc daily in 4 week). They had noticed flattening of filiform papilla and parakeratosis of the tongue and buccal epithelium.^(25,26) In a survey done by Dr.Chen on the structural changes of rabbits with 2.5 ppm zinc in their diet. Loss of appetite, hair loss and epithelial parakeratosis were observed.⁽²⁷⁻²⁹⁾ One of the most important results that we have gained in our study is that, in addition to geographic tongue, zinc sulfate can be prescribed in other lesions and mucosal ulcers with unknown etiology and treatment.

CONCLUSION

The role of zinc in maintaining healthy epithelial tissues, renewing of filiform papillae and the positive effect of zinc sulfate in treatment of geographic tongue were clearly observed.

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