

# Comparisson of Serum Zing Level in Recurrent Patients and Normal Individuals

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## ABSTRACT

**Introduction:** Recurrent oral aphthous is one of the most common ulcerative lesions of the oral cavity which no specific treatment has been introduced for it, sofar. Some studies suggest the zinc deficiency as one of the etiologic factors in aphthous ulcers and also in other experimental studies, zinc composition has been effective in aphthous treatment. The aim of this stud was to determinate the serum zinc level in normal and aphthous individuals.

**Methods:** This was a case-control study in which 88 individuals (44 normal and 44 aphthous patients) were studied. Both groups were equalized for age and sex. Sampling was convinence. The blood samples were taken and the zinc level of them were measured by Atomic Absortion Spectrometer and then the results were statistically analyzed with t-test.

**Results:** This study showed that the average serum zinc level in the case group was  $70 \pm 9 \mu\text{g/dlit}$  and in the control was  $94 \pm 14 \mu\text{g/dlit}$  and there is a significant difference between two groups ( $P < 0.001$ ).

**Conclusion:** According to above results, serum zinc level is significantly lower in Recurrent Aphthous Stomatitis (RAS) patients, thus the determination of serum zinc level, and prescribing zinc if its serum level is low, are recommended in RAS patients.

**Key words:** recommend aphthous, serum zinc level, absortion spectrometer

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## Introduction

Recurrent aphtous stomatitis (RAS) is one of the most common ulcerative lesions of the oral cavity in the all around the world and it's prevalence is about 20% of population<sup>1</sup>. In specific societies it's rate of prevalence varies between 20 to 60%<sup>2</sup>.

This lesion may occur in everybody, although women are more susceptible<sup>2</sup>. Also this lesion can be on a familial pattern<sup>3</sup>. It is not a dangerous and life threatening disease, but considering its major symptoms such as burning and fain, this lesion can cause emotional disorders in patients and, on the other hand, its psychologic and social problems can affect the patient's life<sup>3</sup>. Although the major etiologic factors of RAS have not

been yet known but precipitating factors such as trauma, endocrine abnormalities, psychologic factors, and allergic problems also can play a role in accurance of this lesion<sup>3</sup>. Since a variety of ethiologic factors could cause RAS, the role of micronutritions such as zinc, iron, and copper must be taken into account, on the other hand, zinc has also been linked with RAS in preliminary studies<sup>4</sup> and in one reported case<sup>5</sup>. A preliminary trial found that Zinc supplementation up to isomg per day reduced the recurrence of RAS in 50 to 100% of participants who were zinc deficient<sup>6</sup>. However, a double-blind trial (that did not test people for zinc deficiency) did not find zinc supplements helpful for RAS<sup>7</sup>.

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Since, according to the investigations, the zinc deficiency of soil, and as a result, of the agricultural products are endemic in Iran, so the aim of this research was to study the relationship between zinc level and the occurrence of RAS<sup>8</sup>.

### Subjects and Methods

This study was a case-control study. Case group was consisted of those affected with RAS and control group was selected from healthy people.

In this study, sample group included all of the patients which had the inclusion criteria for the study and were referred to the dental clinics and oral medicine department of school of dentistry of Isfahan and the sampling method was convenience.

According to recent investigations and the results in this field, the sample size was 44 in each group.

After clinical examination of individuals and determining the presence of RAS in their oral cavity, and taking consent form, 5 cc of their venous blood were taken and transferred to the laboratory tubes, containing of nitrate free EDTA.

Control group were selected from the patients who were referred to clinincs and did not have a history of RAS. Serum zinc level of control group blood samples were taken at the same day as of the case group.

All of the blood samples were measured by the same person and by means of Atomic Absorption spectrometer. It should be mentioned that the most of the cases had referred in the 3<sup>rd</sup> or 5<sup>th</sup> days of their RAS disease period (Mean 4<sup>th</sup>).

Necessary information including age, sex, place, back ground, and duration of ulcers were collected in questionnaires and then the results were statistically analyzed by student t-test.

### Atomic Absorption Spectrometer

Blood samples were collected into 1% EDTA tubes and plasma zinc level was measured established atomic absorption method as, previously described. Briefly,

plasma samples were mixed with nitric acid and hydrogen peroxide and Zinc concentration was determined using a varian AA220 spectrometer equaled with GTA-110 graphite oven. 20 micro liters of each sample was injected and absorbance signal was measured.

The concentration of zinc in each samples was determined by comparison of its absorbance signal with of the standard solutions with known zinc concentrations.

### Results

The results showed that about 79.55% of cases had minor and 13.64% had major aphtous ulcers, and 6.81% of them had herpetiform ulcers (table 1).

The average number of ulcers in total patients was  $10 \pm 2$  (mean  $\pm$  sd) and the most number of ulcers were herpetiform and minor ones (table 2).

The average duration of involvement was  $6.4 \pm 2.3$  years, totally, that this average was  $5.7 \pm 1.4$  in men and  $6.9 \pm 0.9$  in women. Also, the long duration of involvements of RAS were 14 years in women and 17 years in men

The average recurrency duration of lesions was  $1.5 \pm 0.2$  months (male:  $2.1 \pm 0.1$ ; female:  $1.3 \pm 0.3$ ). Serum zinc level measured by Atomic Absorption Spectromotor showed that the average of serum zinc level in the case group was  $70 \pm 9 \mu\text{g/dlit}$  and in the control group was  $94 \pm 14 \mu\text{g/dlit}$ .

Based on gender frequency, 71.42% of men 73.33% of women had low zinc levels and there was not any significant difference between these two groups (table 3).

Comparing with normal serum zinc level ( $70 \pm 15 \mu\text{g/dlit}$ ), 32 cases had lower serum zinc levels than normal and there was a statistically significant difference between RAS patients and healthy individuals, based on  $X^2$  test ( $p < 0.05$ ).

**Table 1: Frequency of classification of RAS, based on gender**

Sex \ Ulcer	Minor	Major N(percent)	Herptiform N(Percent)	Total N(percent)
Male	10 (71.4)	1 (7.1)	3(21.4)	14 (31.8)
Female	25 (83.3)	5 (16.7)	0(0)	30(68.2)
Total	35 (79.6)	6(13.7)	3(6.8)	44(100)

**Table 2: Frequency of number of ulcers, based on sex**

Sex \ Ulcer age	<5 N(percent)	5-10 N(percent)	10-15 N(percent)	15-20 N(percent)	20-25 N(percent)	25< N(percent)	Total N(percent)
Male	4(28.6)	10(71.4)	0(0)	0(0)	0(0)	0(0)	14.31.8)
Female	3(10)	18(60)	6(20)	1(3.3)	2(6.7)	0(0)	30(68.2)
Total	7(15.9)	28(63.6)	6(13.6)	1(2.7)	2(4.55)	0(0)	44(100)

**Table 3: Zinc deficiency, based on sex in case group**

Sex \ Zinc level	Deficent N(percent)	Normal N(percent)	Total N(percent)
Male	10(71.4)	4(28.6)	14(31.9)
Female	22(73.3)	8(26.6)	30(68.1)
Total	32(72.7)	12(27.3)	44(100)

### Discussion and Conclusion

Using t-test, there is a significant difference between the averages of serum zinc levels of two groups. Despite the fact there have been studies concerning serum zinc level in RAS patients<sup>10, 11</sup>.

Based on  $X^2$  test, this study showed that there is a significant difference between the number of RAS patients with zinc deficiency compared with normal group ( $p > 0.05$ ).

About 72.7% of RAS patients and 15.9% of healthy individuals had low zinc levels based on the definition of zinc deficiency which means there serum zinc level lower than  $70 \mu\text{g/dlit}$ . Also this study showed that there is not a gender predilection in zinc deficiency.

Considering the studies indicating that zinc

deficiency and soil poverty of zinc is endemic in Iran,<sup>8,9</sup> zinc deficiency should be taken in to account in patients affected with RAS and even zinc therapy have been proved and recommended in some studies<sup>10, 11</sup>.

Other results showed that 2/3 of patients were women and the lesions were mostly seen in the 3<sup>rd</sup> decades of life in both sexes. Finally, although the role of zinc deficiency has been proved in RAS patients but other micronutritional deficiencies such as iron, vitamine B<sub>12</sub>, folic acid, and selenium should be considered.

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