

# The Relationship between Geographic Tongue and Stress

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## Abstract

**Background:** Geographic tongue (GT) is a fairly common and usually asymptomatic disorder that is often detected on routine dental examinations. Characteristic lesions appear as multiple, well-demarcated zones of erythema, concentrated at the tip and lateral borders of tongue. Although the etiology of the condition is unknown, it may be related to stress. The purpose of this study was to evaluate the association between GT and stress.

**Method:** This study was performed on 60 patients with GT and 60 patients without GT. All the patients filled a questionnaire and a psychologist evaluated them.

**Results:** The total mean score of stress was 19.8 in GT group and 15.8 in the control group.

**Conclusion:** According to the results, there is an association between stress and GT. Decreasing stress in GT patients can lead to the healing of the lesion. Other factors that may be associated with GT should be studied in future.

**Keywords:** Geographic tongue; Stress; Perceived Stress Scale

## Introduction

Geographic tongue or erythema migrans is a common benign condition that primarily affects the tongue. It is often detected on routine examination of the oral mucosa. The characteristic lesions of erythema migrans are seen on the anterior two thirds of the dorsal tongue mucosa. They appear as multiple, well-demarcated zones of erythema, concentrated at the tip and lateral borders of tongue. This erythema is due to atrophy of the filiform papilla, and these atrophic areas are typically surrounded at least partially by a slightly elevated, yellowish-white, serpentine or scalloped border. The lesions appear quickly in one area, healing within a few days or weeks, and then they develop in a very different area. Frequently, the lesion begins as a small white patch, which then devel-

ops a central erythematous atrophic zone and enlarges centrifugally. The lesions are usually asymptomatic, although a burning sensation or sensitivity to hot or spicy foods may be noted when the lesions are active.<sup>1</sup>

Very infrequently, erythema migrans may occur on oral mucosal sites other than the tongue. In this instance, the condition is called ectopic geographic tongue.<sup>1</sup>

Even though erythema migrans has been documented for many years, the etiopathogenesis is still unknown. Many risk factors have been proposed for GT including hormonal disturbances and oral contraceptive use,<sup>2</sup> psychological findings,<sup>3</sup> diabetes mellitus,<sup>4</sup> allergic conditions such as atopy,<sup>5</sup> hay fever and rhinitis,<sup>6</sup> dermatological diseases such as psoriasis,<sup>7</sup> and Reiter's Syndrome.<sup>8</sup> There is also a reported correlation with Down Syndrome<sup>9</sup> and fissured tongue.<sup>10</sup> A family history has also been reported to be associated with GT<sup>11</sup> which may be genetic and linked to major histocompatibility complex.

Psychosomatic factors appear to play a significant role in the etiology of geographic tongue.<sup>12</sup> It has

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been reported that lesions arise in connection with pronounced emotional stress. Redman *et al.* found a higher prevalence of geographic tongue in mentally ill patients than in university students. They also noted that under emotional stress the student group with geographic tongue tended to have more severe lesions. These findings support the possible role of psychological factors in the etiology of geographic tongue.<sup>3</sup> The purpose of this study was to evaluate the association between GT and stress.

## Materials and Methods

Sixty patients (38 women and 22 men) with GT were selected for this study. They were referred to the Department of Oral Medicine in Tabriz University of Medical Sciences from May 2008 to July 2008. A specialist in the Oral Medicine Department made the diagnosis mainly on clinical features. The control group consisted of 60 healthy persons without GT among whom there were some patients who had referred to the department for dental screen and check up; we used simple random sampling. The patient and control groups filled the Perceived Stress Scale (PSS) questionnaire<sup>13</sup> A psychologist evaluated the results. All the subjects were informed about the research characteristics and agreed to participate in the study by signing the free and informed consent form (ethical issue). We used Chi-square test and SPSS software (Version 15, Chicago, IL, USA) to analyze the data.

## Results

The mean age of the GT group was 27.5 and that of the control group was 24.6 years. There were 77 women (64.2%) and 43 men (35.8%); 38 women and 22 men were in the GT group and 39 women and 21 men were in the control group. The total mean score of stress in the GT group was 19.8 and that in the control group was 15.9.

The difference was statistically significant ( $p < 0.001$ ). There was neither a significant relationship between age and GT ( $p = 0.217$ ) nor between sex and the disorder ( $p = 0.465$ ) but stress had a significant relationship with GT ( $p < 0.001$ ). Adding one score to the final score of stress, risk of GT increased 1.16 times (OR=1.16)

## Discussion

Geographic tongue is a common lesion that mostly appears on the dorsal and lateral border of the tongue.<sup>1</sup> No study could mention a specific etiology for GT; yet there are several factors such as stress, allergy, and genetic and systemic diseases.<sup>1</sup> According to the results of our study, GT is associated with stress; this is consistent with Redman's reports.<sup>3</sup>

Shulman and Carpenter<sup>14</sup> studied the prevalence and risk factors associated with geographic tongue among US adults. Their findings showed no significant relationship between stress and GT. One explanation for this discrepancy may be due to differences in the recording of stress. There are no physiologic measures of stress such as serum cortisol levels, or questionnaires directly addressing stress.

Jainkittivong and Laglais<sup>15</sup> investigated the clinical characteristics and assessed other factors associated with geographic tongue in Thailand. They found no significant difference in the incidence of medical problems between the subjects and controls with geographic tongue. The incidence of stress-related condition in the subject group was not significantly higher than that in the control group. So, stress was not an etiologic factor for GT. This might, of course, be due to few samples in that study.

Zegareli<sup>16</sup> studied 57 patients suffering from burning mouth and found that psychiatric factors were the most common cause. There was no association between GT and psychologic disorders. This can be because of the use of a small number of samples and insufficient assessment of stress.

In Bánóczy *et al.*'s<sup>17</sup> study GT had an association with emotional stress. They studied GT's clinical and histopathological features. Women were more affected (65.7%) and the patients were mostly in their 5<sup>th</sup> decade of life or older. GT in 20% of cases had coincidence with other anomalies of the tongue and in other 20% it was associated with emotional stress.

In the present case control study, we evaluated the association of emotional stress with GT, using a standard questionnaire, but other etiologic factors such as strength and limitation were not evaluated. We recommend other studies to evaluate the role of other factors in the etiology of GT. According to the results, stress has an association with GT and decreasing stress in GT patients can be helpful in healing the lesions.

**Conflict of interest:** None declared.

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