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The Relationship between Anger Expression and Its Indices and Oral Lichen Planus

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Oral lichen planus (OLP) is a common inflammatory disease with unknown etiology. Depression, stress and anxiety are psychological factors that their influence on the expression of lichen planus by affecting the immune system's function has been confirmed. There is a probable relationship between anger and OLP expression. Therefore, the present study aimed to evaluate the association of "anger" and OLP. In this descriptive study 95 subjects were included in 3 groups. A: patients with oral lichen planus, B: positive control, C: negative control. Anger and its indices were assessed by the State-Trait Anger Expression Inventory-2 (STAXI-2) questionnaire, and pain was measured via the Visual Analogue Scale (VAS). The collected data were analyzed statistically using SPSS 18 software. The lichen planus and positive control groups bore higher total anger index (AX index) values compared with the negative control. Comparing anger expression-in (AXI) among the lichen planus and negative control groups revealed higher grades in lichen planus group. Evaluating the pain severity index (VAS) data and anger indices in lichen planus group, Spearman's Rank Correlation Test revealed a significant correlation between TAngR (reactional anger traits) and pain severity. The findings of this study indicated that there was a significant correlation between anger control and suppression of lichen planus development. On the other hand, the patients with more severe pain mostly expressed their anger physically. Based on the findings, we can make the claim that anger suppression and its control-in (gathering tension) may play a role in the development of lichen planus as a known psychosomatic disorders.

Key Words: Anger; Lichen planus; Visual analog scale

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INTRODUCTION

Oral lichen planus (OLP) is a common inflammatory disease with a prevalence of 0.5-2.2% in the general population. This disease is manifested with reticular, plaque-like, papular, bullous, erythematous, and ulcerative patterns in adult patients. Ulcerative and erythematous forms of oral lichen planus can lead to various symptoms ranging from a burning sensation of the mouth, to severe pain that would interfere with speaking, eating, and swallowing.^{1,2} The etiology of oral lichen planus has re-

mained unknown and there are not any preventive therapies for the disease. Therefore, all treatment strategies aim to reduce or eliminate the symptoms.¹ Different studies have reported changes in cellular immunity, hypothalamus-pituitary-adrenal axis and salivary cortisol levels associated with lichen planus. Thus, the factors affecting the immune system could cause the development of this disease.^{1,3} With the effects of psychological stress-producing factor on cellular immunity response, numerous studies are being performed on the association of psychological factors and immune system changes.⁴ Depression, stress,

and anxiety are psychological factors that influence the expression of lichen planus by affecting the immune system function that have been confirmed.⁵

Anger is one of the emotional states which consists of various feelings ranging from mild discomfort to severe outburst.⁶

Several studies have described the association of anger with chronic diseases by its effect on immune system. Inflammatory bowel diseases, congestive heart diseases, atherosclerosis, diabetes mellitus, and prostate carcinoma are among them.^{4,7,8} Anger elevates the natural killer (NK) and T cell response by increasing the sympathetic nervous system and endocrine system responses and decreasing parasympathetic system function. This chain of changes can lead to the development of congestive heart disease.⁸

Another study stated the impact of anger on delayed wound healing time after surgery by affecting the parasympathetic system and elevating cortisol levels.⁴

As mentioned, oral lichen planus is a chronic inflammatory disease. Regarding the available data, the association of anger and OLP has not been studied yet. Based on the above assumptions, there could be probable relationship between anger and OLP expression. Therefore, the present study aimed to evaluate the relationship between anger and oral lichen planus.

MATERIALS AND METHODS

1. Patients and controls

In this descriptive study, patients referred to oral diseases department of Tabriz dental school were included in the study after conducting a clinical examination and obtaining private and written consent based on the following criteria:

Participants were sorted into homogeneous groups based on age and educational levels and then were divided in three groups:

1) Patients stricken with lichen planus: Patients whose clinical or histologic assessments confirmed their oral lichen planus and they did not have any history of the consumption of psychological drugs.

2) Positive control: Patients suffering from burning mouth syndrome, atypical facial pain, or myofascial pain syndrome who did not use any psychological drugs.

3) Negative control: Healthy participants who did not have any oral lesions or certain diseases.

2. Study design

Since there are no similar studies in this field, the parameters were determined using a pilot study. For this purpose, the first 5 subjects were evaluated in each group and the final sample size was determined after performing the pilot study.

In group A patients, the pain and burning levels were measured using a visual analogue scale (VAS). All clinical examinations of the participants were carried out by a single operator (assistant of oral medicine, colleague of this

study) and in the department of oral medicine of the Tabriz Dental School.

Demographic information questionnaires (including: sex, age, educational level, marriage state) and the Persian version of the revised "State-Trait Anger Expression Inventory (STAXI-2)" questionnaire were studied by participants and filled with the operator's help. Following the demographic information questionnaire, the the participants' private information was kept secret, and a number of patient dossiers from dental faculty (which are kept in an archive) were utilized.

The Persian version of STAXI-2 includes 57 items; these phrases are organized into 6 scales and one index of anger-statement according to following:

1. Anger state scale
 2. Anger trait scale
 3. Anger Expression-Out scale
 4. Anger Expression-In scale
 5. Anger Control-Out scale
 6. Anger Control-In scale
- Anger statement index

The mentioned questionnaire was interpreted by a psychologist colleague and then the tested groups were compared. The Persian version of the State-Trait Anger Expression Inventory (STAXI-2) possesses reliability, internal consistency, and construct, content, concurrent, convergent, divergent and discriminant validity. Therefore, it can be used for assessing state-trait anger in clinical sets and research.⁹

The completion of STAX-2 questionnaire was carried out in a post-graduate dental chair unit of the oral disease department with the guidance of an assistant of oral medicine (colleague of the study) without the presence of a third party.

1) Inclusion criteria for group A

- (1) Stricken by oral lichen planus according to clinical and pathological assessments. Stricken between ages 18-60.
- (2) Educated patients (able to complete the questionnaire)¹⁾

2) Inclusion criteria for group B

- (1) Stricken by burning mouth syndrome, atypical facial pains, or myofascial pain syndrome.
- (2) Educated patients (able to fill the questionnaire between the ages of 18-60 years old.)

3) Inclusion criteria for group C

- (1) Educated patients (able to fill the questionnaire)²⁾ between the ages 18-60 years old.)

4) Exclusion criteria of Group A

- (1) Presence of any factors causing lichenoid reactions such as drug consumption, Amalgam restoration.
- (2) Congenital and acquired immune system deficiency

1) In the case of illiterate patients, because the second person is needed for questionnaire reading, these patients were excluded from the study for preventing the influence of the second individual

2) Homogenous with group A

cies such as AIDS, chemotherapy, injective addiction, hemophilic patients, and patients with hemodialysis history.

- (3) Any contraindication for lesion biopsy.
- (4) Any drug therapies that affect the immune system such as corticosteroids.
- (5) Any history of psychological drug consumption.
- (6) Any history of psychological disease.
- (7) The patient's disinterest in participating in the study.

5) Exclusion criteria of group B and C

- (1) Congenital and acquired immune system deficiencies such as AIDS, chemotherapy, injective addiction, hemophilic patients, and patients with hemodialysis history.
- (2) Any drug therapies that affect the immune system such as corticosteroids.
- (3) Any history of psychological drug consumption.
- (4) Any history of psychological disease.
- (5) The patient's disinterest in participating in the study.

The participants were homogeneous regarding age and educational levels and then evaluated in three groups:

- ① Patients stricken with oral lichen planus according to clinical and pathological assessments and aged between 18-60.
- ② Patients suffering from burning mouth syndrome, atypical facial pain, or myofacial pain syndrome;
- ③ Healthy participants who did not have any oral lesions or noted diseases.

Furthermore, the statistical sample size was estimated at 30 individuals in each group according to the pilot study's findings. In the pilot study, 5 individuals were evaluated in each group.

In group A patients, the pain and burning levels were measured using a visual, analogue scale (VAS).

All participants completed the STAXI-2 questionnaire. To minimize bias cases, controls were carefully selected and all clinical examinations of the participants were carried out by a single operator and in the department of oral medicine of the Tabriz Dental School. After the interpretation of the questionnaire, the collected data was analyzed statistically.

For all three groups, one questionnaire was designed; so, for each group, one, consistent method of study was utilized.

3. Methods of statistical analysis of data

The collected data were analyzed statistically using SPSS 18 software with statistically descriptive methods (frequency-percent and mean±standard deviation), the mean difference test for independent groups (ANOVA one-way analysis of variance), Kruskal-Wallis Test for comparing the anger scores and its scales in three groups, Spearman's Rank Correlation Test for assessing the correlation between anger with pain severity of oral lichen planus. Following the significant variance analysis, a Post Hoc test was utilized. In this study a $p < 0.05$ was presumed to be statistically significant.

RESULTS

Ninety-five individuals participated in this study and completed the STAXI-2 questionnaire. The demographic information of participants is shown in Table 1. From these individuals, 32 subjects were in the lichen planus group (19 females and 13 males) with a mean age of 46.97, 32 subjects were in the positive control group (21 females and 11 males) with a mean age of 46.28, and 31 subjects were in the negative control group (13 females and 18 males).

The analysis of the mean differences in the collected data (ANOVA one-way analysis of variance) regarding anger indices in all three groups is shown in Table 2. The indices are as follows: SAngF: the anger state through emotion, SAngV: verbal anger statement, SAngP: physical anger statement, TAngT: anger trait as outburst, TAngR: reactional anger trait, AXO: anger expression-out, AXI: anger expression-in, ACO: anger control-out, ACI: anger control-in, and AX index: total anger index.

In comparing the anger scales' grades between the three independent groups, Kruskal-Wallis analysis revealed significant differences regarding the SAngP, TAngT, AXI, AXO, and AX indexes.

Regarding the mean difference analysis according to the

TABLE 1. Demographic features

Demographic features	Lichen plan	Positive group	Negative group	Total
Age (mean)	49.97 yrs	46.28 yrs	42.1 yrs	
Marriage state				
Singel	5 (5.26%)	4 (4.21%)	13 (13.68%)	22 (23.15%)
Married	27 (28.42%)	28 (29.47%)	18 (18.94%)	73 (76.84%)
Sex				
Female	19 (20%)	21 (22.10%)	18 (18.94%)	58 (61.05%)
Male	13 (13.68%)	11 (11.57%)	31 (32.63%)	37 (38.94%)
Educational level				
Elementary	13 (13.68%)	6 (6.31%)	3 (3.15%)	22 (23.15%)
Middle school	5 (5.26%)	4 (4.21%)	3 (3.15%)	12 (12.63%)
High school	4 (4.21%)	18 (18.94%)	11 (11.57%)	33 (34.73%)
University	10 (10.52%)	4 (4.21%)	14 (14.73%)	28 (29.47%)

TABLE 2. Mean differences

	Group	SAnGF	SAnGV	SAnGP	TAnGT	TAnGR	AXO	AXI	ACO	ACI	AX index
Control+	Mean	8.84	6.38	5.41	5.97	7.16	25.13	24.37	17.53	13.92	66.33
	Std. Deviation	1.31	1.28	0.71	2.29	1.9	2.07	2.1	2.35	2.91	7.12
Lichen plan	Mean	9.58	7.06	5.52	7.53	7.77	25.03	24.76	17.17	14.13	69.42
	Std. Deviation	2.69	2.2	0.81	3.09	2.36	4.55	4.25	4.02	4.1	7.21
Control –	Mean	9.40	7.65	6.48	7.45	7.74	22.81	22.07	18.41	15.08	59.00
	Std. Deviation	1.41	2.36	1.99	2.73	1.61	3.9	4.2	2.69	3.09	10.79
Total	Mean	9.26	7.11	5.80	6.97	7.55	24.32	23.70	17.70	14.37	64.92
	Std. Deviation	1.95	2.11	1.38	2.78	1.98	3.77	3.88	3.09	3.45	9.5
p value		0.346	0.131	0.026	0.046	0.452	0.009	0.035	0.405	0.142	0.005

SAnGF: anger state through emotion, SAnGV: verbal anger statement, SAnGP: physical anger statement, TAnGT: anger trait as outburst, TAnGR: reactional anger trait, AXO: anger expression-out, AXI: anger expression-in, ACO: anger control-out, ACI: anger control-in, AX index: total anger index.

Post-Hoc test findings, the lichen planus and positive control groups bore higher AX index scores in comparison with the negative control. A significant difference was observed in SAnGP among the lichen planus and negative control groups and also in positive and negative control groups. Also comparing the AXO index among the positive and negative controls and the AXI index between the lichen planus and positive control groups showed a significant difference among the positive and negative controls and also between the lichen planus and negative control groups. The negative control group showed a higher SAnGP index score compared to the positive control group and the AXO index mean value was higher in the positive control group in comparison with the negative control group. Also higher grades on the AXI were observed in the lichen planus group compared to the negative control groups.

Evaluating the pain severity index (VAS) data and anger indices in the lichen planus group, Spearman's Rank Correlation Test revealed a significant correlation between the Total Anger index (TAnGR) and pain severity (p value=0.034). There were not any significant relationships found on using the other scales.

DISCUSSION

In this study, the relationship between anger states and their indices and oral lichen planus and its comparison with anger states in healthy individuals were carried out for the first time.

The Anger Expression Index (AX index) that indicates the difference between individuals on Anger Expression-Out (AXO), Anger Expression-In (AXI), Anger Control-Out (ACO), and Anger Control-In (ACI) indices were significantly different among the three groups.

The lichen planus group showed higher AX index grades compared to healthy, normal individuals. Separate anger scales' evaluations indicated that lichen planus individuals had higher AXI index scores. Based on the findings of the present study, lichen planus subjects have a greater tendency to experience the type on anger which is repressed and not expressed.

The positive control subjects with higher anger control-out (ACO) scale on the other hand, showed a greater tendency to direct their own anger through verbal or physical outburst behaviors toward other people or things in the environment.

In our study, both the lichen planus and positive control individuals showed higher grades on the anger state scale with the tendency of its physical expression compared to the negative control. This scale indicates the anger severity and an individual's tendency to express it physically. In comparison to pain levels associated to oral lesions or lichen planus with anger indices, the findings of this study showed that there is a significant relationship between pain intensity and the reactional anger traits (TAnGR) scale. In other words, the patients with more severe pain in lesions often expressed their anger experience through outburst reactions during examination intervals.

Lichen planus is a chronic mucocutaneous disorder with an unknown etiology. Psychiatric disturbances are known as one of the causative factors in this disease.⁸

With regard to the results, patients with oral lichen planus prefer to express their anger internally which leads to gathering tension; on the other hand, at the time needed to express those feelings, they showed anger in a non-adaptive and physical model. In fact, the assertion ring of the anger expression chain is often missed, so they use their "fists instead of words".

According to this study, it seems that lichen planus patients use their oral cavity as a shock organ and to some extent they are fixed in the oral stage of psychological development.

In addition, the correlation between pain and reactional anger traits was significant.

There are still controversies regarding the relationship of psychiatric disturbances and oral lichen planus expression.¹⁰⁻¹⁴

Merchant, in a prospective study, concludes that reduced social isolation and anger expression may play an important role in maintaining oral health, as well as general health and well-being. In this study this model of anger expression was not assessed.¹¹

Hampf et al.¹⁴ in a controlled study using Cornell Medical Index Psychological Questionnaire found significant differences regarding psychological disorders among OLP and non-OLP individuals. They indicated that the OLP stricken people tend to have more psychological disorders.

In a study by GHQ-28 questionnaire, Chaudhary indicated that psychiatric disturbances such as stress, anxiety, and depression are significantly more prevalent in subjects with lichen planus rather than healthy individuals. In this study, he showed that there were not any significant differences among the positive control (patients with orofacial pain with psychological etiology without subjective symptoms) and lichen planus subjects regarding mentioned psychological factors.⁷

Similar results were found in the Farhad Mollashahi et al.¹⁵ study.

In separate studies by Thanakan and Alen et al, no significant differences among OLP and healthy individuals regarding psychological disorders were reported.^{16,17}

Finally, we believe that 'anger management programs' as a treatment option could be useful in the control of oral lichen planus and reduction of lesions' pain.^{10,12}

The findings of this study indicated that there is a significant correlation between anger control, its suppression (gathering tension), and lichen planus development. On the other hand, the patients with lichen planus, mostly expressed their anger physically and in non-adaptive ways.

1. Limitations and suggestions

Since the evaluation of the relationship between anger and lichen planus disorder has been conducted for the first time in this study, more comprehensive studies are needed in this field for the confirmation of the obtained results.

1) Some of the limitations of the study are as follows: The accuracy of responses is based on the honesty of participant. For example participants may have a conservative response bias and only respond positively to questions. Also there was no possibility of assessing the clinical course of lichen planus lesion changes according to the anger encountered and evaluating the severity of lesion at the time of anger expression.

Including more patients and also looking at underlying psychiatric symptoms to exclude their potential influence on the study's results is also recommended for future studies. In these instances, the state and traits of anger in exacerbation and remission periods of lichen planus could be measured and compared.

CONFLICT OF INTEREST STATEMENT

None declared.

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