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Stressful Life Events and Personality Traits in Patients with Oral Lichen Planus

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ABSTRACT The onset and aggravation of symptoms in patients with oral lichen planus (OLP) are related to psychosomatic constitution and stress involvement. The aim of this study was to evaluate the influence of stressful life events and neuroticism as a personality trait in patients with OLP. A total of 32 patients with clinically and histopathological proven cases of OLP (16 with the nonerosive and 16 with erosive form), along with 31 healthy controls without oral lesions matched for age and sex were included in the study. Neurotic tendency and intensity of anxiety, depression, and negative affects and the number and type of stressful life events were investigated by the instruments Big Five Plus Two and Holmes and Rahe`s Social Readjustment Rating Scale, respectively. Data about life experience in war and its consequences were also collected. Univariate and multivariate analysis showed significantly greater anxiety, depression and negative affects tendency, as well as greater intensity and number of experienced stressful life events compared with controls ($P<0.01$). The distribution of subjects with at least one stressful event ($P<0.01$), family matters ($P<0.01$) and war experiences ($P<0.05$) was significant in the OLP group. The logistic regression results (OR=1.97) indicate that with each new stressful event a person is about two times more likely to get OLP. The degree, number, and type of stressful life changes and neuroticisms tendency independently play an important role in the onset or reactivation of OLP, depending on the individual's psychological constitution and the large differences in each person's ability to cope and their particular reactions to stress.

KEY WORDS: oral lichen planus, stress, life changes, personality assessments, risk factors

INTRODUCTION

Psychosomatically constitution and stress involvement have been strongly associated with different dermatological conditions. Despite numerous studies, etiopathogenesis and risk factors in oral lichen planus (OLP) are still unclear. It has been established that a cluster of social events requiring life adjustment are significantly associated with disease onset (1). Patients with oral or cutaneous lichen planus more frequently reported occurrences or exacerbation of the disease during periods of emotional instability caused by stressful life events (2-5). Using standardized or self-reporting questionnaires for identifying major stressful life events, some studies demonstrated prevalence of such events was between 67% and 89% patients with lichen planus, mostly with cutaneous lesions (4,5). Psychological symptoms of anxiety, depression, and stress seemed to have a significant prevalence in patients with OLP (6-13). According to various previous studies it is difficult to conclude whether they are the direct cause or a consequence

Acta Dermatovenerol Croat
2015;23(4):270-276

of the disease. However, a small number of authors failed to find the differences in the degree of stress (or stressful events), anxiety, and depression between the patients with OLP and the control group (14-17). Except short term emotional symptoms, personality and psychiatric morbidity was also found to have a significant impact in women with OLP (18). Neuroticism, as a personality trait, is the tendency to experience negative emotions, such as anger, anxiety, or depression, and is interlinked with low tolerance for stress or aversive stimuli (19). Except a positive relationship between anxiety traits and OLP (6,11,20), there is a lack of information in the literature about neurotic tendencies and triggering stressful life events in patients with OLP. Thus, we evaluated the influence of neuroticism and stressful life changing events in the onset or reactivation of OLP.

PATIENTS AND METHODS

The study was conducted as a prospective, case control study in the Oral Medicine Section of the Dental Clinic, Faculty of Medicine, Novi Sad, Serbia, between January 2011 and December 2012. The study group consisted of 32 consecutive cases of OLP (16 patients with the nonerosive (reticular) and 16 with erosive form), with the onset being not more than 6 months ago or with recent exacerbation of old oral lichen planus. Visual examination of the mouth was carried out by one oral medicine specialist experience in the field. The diagnosis of each subject with OLP was based on both typical clinical features and histological findings (21). The control group consisted of 31 systemically healthy subjects without oral mucosal lesions, referred during the same period for reasons such as dental treatment. Controls were matched to the cases in gender, age, time of enrollment, and residence. All subject exclusion criteria were anamnestic or clinical history of psychosomatic alterations or treatment with psychoactive drugs, and the presence of systemic diseases (immune, neoplastic, infectious, and endocrine diseases).

The study was approved by Ethics Committee of the Faculty and was conducted in full accordance with ethical principles. Each subjects signed a written informed consent form prior to enrolment in the study.

Assessment of stressful life events and tendency towards neuroticisms

The scale for the assessment of stressful life events was a Social Readjustment Rating Scale (SRRS) developed by the American psychiatrists Holmes and Rahe (22) designed to measure the level of stress conceptualized in terms of stressful life events. The original scale contains 43 stressful life events, and subjects were asked to choose those from the list which he/she experienced over the period of one year before onset or reactivation of the disease. In this way, the instrument makes it possible to detect all major stressors ranked by intensity. To measure stress intensity according to SRRS, each life event is assigned a value in arbitrary "life changing units" chosen to reflect the relative amount of stress the event causes in the population studied. A final score of 150 gives a 50-50 chance of developing an illness. A score of 300+ gives a 90% chance of developing an illness, having an accident, or "blowing up". These final score give a rough estimate of stress level. The number of stressful events and the most common types of events was determined too. In addition, in accord with Manolache *et al.* (4) we also divided the life changes described by Holmes and Rahe in their scale into three categories: family, personal, and job or financial problems. This classification has been made after the collection of data with the aim of simplifying and highlighting the impact of certain stressful event categories. After completion of the questionnaire, subjects were asked an additional question about life experiences in war and the consequences of war.

The Big Five Plus Two Inventory (BF+2) (23) was administrated to assess the tendency towards anxiety, depression, and negative affects as a subscale of neuroticism personality traits. This inventory represented a psycholexical model of personality in Serbian language, based on a non-restrictive methodology by Tellegen and Waller (24). The original questionnaire consists of 184 items with a proposed five-point Likert-type scale answer, which operationalize the seven personality traits. From the original questionnaire, we extracted only neuroticisms as dimension of personality with 35 items and three subscales (anxiety, depression and negative affect).

Written instructions were given to each subject who completed the SRRS and BF+2 inventories. These questionnaires were administered by one investigator in the subject's native language and evaluated by a clinical psychologist in both the case and control group.

Statistical analysis

Data were described as frequency distribution, mean±standard deviation (SD). Fisher's exact test and Chi-square test were used for categorical data, and Student`s t-test and two-factor ANOVA with a mixed groups design were used for parametric and Mann-Whitney test for nonparametric data in order to study

the differences between the groups. By using a general linear model multivariate procedure, multiple comparison were obtained to compare the questionnaire scores of the subjects with erosive, nonerosive, and control groups. Direct logistic regression was used to calculate odds ratios (OR) with 95% confidence intervals (CI). Correlations between life events and personality traits were analyzed using Spearman's rho correlation coefficient. The values $P<0.01$ and $P<0.05$ was considered statistically significant. Statistical analysis was performed using SPSS, version 17 (WinWrap Basic, Nikiski, AK, USA).

RESULTS

The mean age of the OLP group was 54.28±14.99 years, and 55.74±13.94 in the control group. The women were predominant: there were 21 women in both groups and 11 men in the OLP and 10 men in the control group. Six (18.8%) patients with OLP also had cutaneous lesions. Lesions at various sites were found in 29 (90.6%) of patients with OLP, and most affected were buccal mucosa at the sides of the tongue. Seven (21.9%) of patients with OLP showed no symptoms, 13 (40.6%) manifested oral discomfort, and the other 12 (37.5%) complained of painful symptoms in the oral cavity. The average time of lesion development before evaluation was 7.84±11.0 (range 1-32) months. In twenty (62.5%) patients with OLP the onset of the lesions was less than one month, between 1 and 6 months before evaluation in 3 (9.4%), and in 9 (28.1%) had experienced reactivation of old oral lichen planus. There were no significant differences in age, sex, and socio-professional characteristics of the patients with OLP and controls (Table 1), which indicates highly comparable groups in the sample.

The SRRS scores ranged from 24 to 252 units, with a mean value of 155.56±52.06 units in the OLP group, and from 0 to 219 units, with a mean value of 66.26±80.11 units in the control group. In patients with OLP the average number of stressful events was 4.06±1.19, while in the control group it was 1.77±2.2. The mean score obtained from BF+2 for the patients with OLP for anxiety, depression and negative affects was 32.44±11.78, 19.69±8.96, and 34.75±11.55, respectively,, and 22.68±9.18, 13.9±3.89, and 24.74±9.30 respectively for healthy controls (Table 2). Significant differences were observed between the groups with respect to intensity of stress, number of stressful life events, and all three subscales of neuroticism.

Multivariate analysis showed an overall group effect ($F=4.437$, $P<0.001$) and a significant difference ($p<0.01$) in all tested variables (SRRS scores, SRRS

Table 1. Age, sex and socio-professional data about the groups

Sociodemographical data	No. (%) in OLP group (n=32)	No. (%) in control group (n=31)	Test statistics	Significance (*P*)
Age				
(Mean±SD)	54.28±14.99	55.74±13.94	t=0.400	*P*>0.05
Range (min-max)	25-73	27-72		
Sex				
men	11 (34.40%)	10 (32.3%)	Fisher test	*P*>0.05
women	21 (65.60%)	21 (67.7%)		
Educational level				
incomplete elementary or elementary education	11 (34.4%)	6 (19.4%)	χ^2=1.890	*P*>0.05
secondary	11 (34.4%)	12 (38.7%)		
college or faculty	10 (31.3%)	13 (41.9%)		
Employment				
yes	11 (34.4%)	15 (48.4%)	χ^2= 1.916	*P*>0.05
no	12 (37.5%)	7 (22.6%)		
retired	9 (29.0%)	9 (29.0%)		
Monthly income in Euros				
mean±SD	286.32±188.43	309.47±172.82	t=0.452	*P*>0.05
Marital status				
married	24 (75.0%)	22 (71.0%)	Fisher test	*P*>0.05
divorced /single/widowed	8 (25.0%)	9 (29.0%)		

*OLP: oral lichen planus; SD: standard deviation; t: Student`s t-test

Acta Dermatovenerol Croat
2015;23(4):270-276

Table 2. Univariate analysis of tested variables (mean±SD) between the groups

Questionnaire			Test statistics	Significance (*P*)
	OLP group	Control group		
SRRS intensity of stress	155.56±52.06	66.26±80.11	U=176.5	*P*<0.01
SRRS number of stress event	4.06±1.19	1.77±2.2	t=-5.154	*P*<0.01
BF+2 anxiety subscale	32.44±11.78	22.68±9.18	U=235.5	*P*<0.01
BF+2 depression subscale	19.69±8.96	13.9±3.89	U=302.5	*P*<0.01
BF+2 negative affect subscale	34.75±11.55	24.74±9.30	U=244.0	*P*<0.01

*OLP: oral lichen planus; SD: standard deviation; U: Mann-Whitney U test; t: Student`s t-test; SRRS: Social Readjustment Rating Scale; BF+2: Big Five Plus Two Inventory

number of events, BF+2 anxiety, BF+2 depression, and BF+2 negative affects) between the three groups: erosive OLP, nonerosive OLP, and control. According to Scheffe's post hock test we found significant differences (*P*<0.01) between the erosive OLP group and controls in all variables, the nonerosive OLP group and controls in SRRS scores (*P*<0.01), SRRS number of events (*P*<0.01), and BF+2 negative affects (*P*<0.05), as well as borderline significance in BF+2 anxiety and BF+2 depression (*P*=0.057, *P*=0.064) and no significant differences between erosive and nonerosive OLP (data not shown). There was no significant correlation between SRRS and neuroticism scores (data not shown).

Data concerning the number of stressful life events are presented in Table 3. Thirty (93.7%) patients with OLP had chosen at least one stressful event from the list, while in the control group 21 (67.74%) subjects did so. The majority of patients with OLP reported four or five stressful life events, while in the control group the majority of subjects had experienced one or no stressful events in past year. This difference in the distribution of subjects with stressful events was significant (χ^2=39.022, *P*<0.01).

Regarding the difference in types of events between the OLP and control groups, there were significant differences (F=13.46; *P*<0.01) and group effect (F=24.65, *P*<0.01) (ANOVA). Thirty (93.7%) patients with OLP reported at least one family stressful evens. Most frequent was the death of a close family member in 20 (62.5%) patients with OLP. The family issues in the OLP group showed significant differences (*P*<0.01) compared to job problems in the same group, and all three type of events in the control group. Personal events were also important for patients with OLP (87.5% patients cited at least one personal issue) with a significant differences (*P*<0.01) compared with job and personal events in control subjects. There was no difference between the groups regarding the problems related to jobs or to financial status (data not shown).

In comparison with the control group, significantly more patients with OLP were exposed to war and its consequences (χ^2=5.908, *P*<0.05). Patients with OLP and war trauma showed higher mean scores in SRRS, with borderline significance (Mann-Whitney test, *P*=0.074), and in all three subscales of BF+2 with no difference compared to patients with OLP without those life experiences. Moderate positive correlation, also with a borderline *P* value (rho=0.321, *P*=0.073) was found between the presence of war experienc-

Table 3. Number of stressful life events in the OLP group compared with controls

Number of events	No. (%) in OLP group (n=32)	No. (%) in control group (n=31)	Significance based on the Pearson chi-square test (*P*)
At least one event	30 (93.70%)	21 (67.74%)	*P*<0.01
No event	2 (6.30%)	10 (32.26%)	
1 event	0 (0.00%)	11 (35.48%)	
2 events	5 (15.63%)	2 (6.45%)	
3 events	3 (9.38%)	2 (6.45%)	
4 events	11 (34.37%)	2 (6.45%)	
5 events	9 (28.13%)	1 (3.23%)	
≥6 events	2 (6.30%)	3(9.69%)	

*OLP: oral lichen planus

Acta Dermatovenerol Croat
2015;23(4):270-276

Table 4. Number of stressful life events in direct logistic regression analysis as a possible risk indicator for oral lichen planus (OLP)

	B	S.E.	Wald	df	*P*	OR (95% CI)
Number of stressful life events	0.687	0.174	15.243	1	0.000	1.97 (1.40-2.77)
Constant	-1.938	0.588	10.870	1	0.001	0.144

*OR: odds ratio; CI: confidence interval

es and intensity of stressful events in the OLP group (data not shown).

Direct logistic regression was performed to assess the effect of the number of stressful life events as a possible risk indicator for OLP (Table 4). The model was significant (χ^2=21.51, *P* <0.001). Nagelkerke's R squared (0.39) suggested a lower to moderate correlation between the number of stressful life events and OLP. The overall success of prediction was 79%. According to the Wald criterion the number of stressful events significantly contributes to the prediction of disease (p<0.001). The results of logistic regression analysis indicate (OR=1.97) that with each new stressful event a person is about two times more likely to get oral lichen planus.

DISCUSSION

In this study we analyzed the influence of stressful life events on constitutional neuroticism tendencies in patients with OLP (erosive and nonerosive). The presence of a highly comparable group of healthy individuals, which is not so common in the literature, gives us a chance to objectively evaluate observed parameters in a sample similar to those used by others (20-50 patients) (4,5,8,11-13,15-18). Our findings show that patients with OLP (especially the erosive form) had a greater number and intensity of stressful life events, along with more prominent anxiety, depression, and negative affect tendencies compared with a matched group of controls.

The mean final score demonstrated a significant level of stress in our patients, which according to Holmes and Rahe (22) leads to an increased chance of stress-related health breakdowns. Stress is a highly personalized process, thus, these measurements are strictly approximate and give only general indications. Perhaps because of that, the results obtained with similar questionnaires in patients with OLP have been controversial. Some authors found increased stress levels but only in a small sample (7) or without a control group (12), and some found no difference compared with controls (14,15). Using the same instrument without taking into account intensity of stress, Manolache *et al.* (4) showed similar results to ours regarding the mean number, distribution, and type of stressful life events in patients with lichen planus. Furthermore, in our sample there were significantly more patients with OLP that reported 4 and 5 life events compared with controls. Bonanno *et al.* (26) reported that the people who had experienced less life events were better able to cope with the disaster. Those with only 1 recent life event were twice as likely to be resilient than those who experienced 2 or 3 recent stressful life events. These finding suggest that effects of stressful events are cumulative and the more bad things happen the worse people become at coping. In our study, 93.7% of patients with OLP identified at least one stressful event before onset or exacerbation of disease, which is more than previously reported in cases of oral (51-67%) (3,7) and cutaneous (67-89%) lichen planus (4,5,25). Most of the healthy subjects identified one or more non-major life events (with low disturbing effects), which explain the high rate of stress involvement in our controls.

Most authors (5,6,11,20) reported high to slight anxiety traits in patients with cutaneous or oral lichen planus measured by the Catell 16 PF or STAI T questionnaires, except Allen *et al.* (16) where those findings were not confirmed. Evaluating psychological profiles in patients with OLP, Ivanovski *et al.* (18) found significantly higher depression tendencies for both reticular OLP and erosive OLP compared with controls. A multivariate model showed no difference between erosive OLP and nonerosive OLP in the present study, which is in agreement with previous studies (2,13,18,20). A higher level of neuroticism that we found, saturated with negative emotions, involves greater reactivity to different stimuli and low stress tolerance. When associated with major stressful events, it may have a role in the development or reactivation of OLP in predisposed individuals.

There has not been much discussion in the literature about the type of stressful events that could be potential predictor in the development of dermatological condition such is lichen planus. This study confirmed the same findings regarding the types of events distribution previously reported in two studies (Romanian and Turkish) conducted mostly for cutaneous lichen planus (4,5). Major family life events (death, serious illness of a family member, separa-

tions and divorce, etc.) were the most common types of event in patients with lichen planus. These findings suggest a similar reaction of the Balkan peoples regarding the strong stressors related to family issues and their possible association with lichen planus. Except family events, personal matters also play an important role as a predictor in occurrences of lichen planus.

In the OLP group, 14 (43.75%) patients had been exposed to war and postwar stressors, compared with 4 (12.9%) controls. Those subjects were refugees from Croatia and Bosnia and Herzegovina. An important correlation also was found between war trauma and degree of recent experienced stressful life events in patients with OLP. Klaric *et al.* (27) reported that the number of recent stressful life events in women who were directly exposed to long-term and extreme war trauma in Bosnia and Herzegovina contributed to the intensity of already existing serious posttraumatic and general psychological symptoms even 10 years after the war. Our findings suggest that war experience may have a long-term effect on stress-coping of the individual, and can consecutively contribute to the development of some psychosomatic disorders such as OLP.

Predicting the possibility of OLP development based on the effect of stressful life events, we found that with each new stressful life events a person is two times more likely to get OLP. Similarly, Manolache *et al.* (4) reported that people exposed to stressful events could have an at least threefold higher risk of lichen planus than people unexposed to stress. The same authors suggested that it was important to evaluate patient psychological traits to see how they modulated the impact of stressful events and induced the psycho-dermatological condition, which was one of the aims in this study.

The results of this study showed that constant stress involvement before the onset or reactivation of diseases support the psychogenic nature of OLP. Moreover, previous studies have proposed an additional psychotherapeutic intervention in patients with stress-related oral and skin diseases (2,10,18). Consequently, there have been some positive predictions about cognitive-behavioral therapy techniques in the management of OLP (28,29).

CONCLUSION

In concert with previous studies, this study indicates that the degree, number, and type of experienced stressful life changes as well as and tendency towards neuroticisms as a personality trait independently play an important role in the onset or reactivation of OLP, depending on the individual psychological constitution, the large differences in each person's ability to cope, and their particular reactions to stress. To reach a definitive conclusion on the contribution of personality traits and stressful life event sin the occurrences of OLP, an extensive longitudinal study would be required.

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