

# Relationship of Psychological Characteristics and Oral Diseases with Possible Psychosomatic Aetiology

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## Summary

*The object of the study was to determine the incidence of the following oral diseases, Aphthae recidivante, Lichen ruber planus, symptoms of xerostomia and stomatopyrosis, and oral parafunction, bruxism and dysgeusia and to examine their possible connection with different intensities of psychological characteristics of self-esteem, anxiety and neuroticism in a sample of inhabitants from the Gorski Kotar area.*

*The study consisted of 277 subjects in whom a detailed oral examination and oral testing were performed. Psychological testing was performed by using part of psychotest "18 PF".*

*The examination showed that in the area of Fužina and Lokava oral parafunction most frequently occurred (in 36.1% of subjects) aphthae lesions (19.2%), followed by bruxism (13.7%), xerostomia (12.27%) and stomatopyrosis (10.3%). Taste disorders (2.3%) and oral lichen (1.2%) rarely occurred.*

*The psychological examination indicated that there was a tendency towards a high level of self-esteem, low level of anxiety and still lower level of general neuroticism.*

*Positive correlation was determined between the occurrence of xerostomia, stomatopyrosis, recurring aphthae and bruxism in relation to the occurrence of anxiety, and stomatopyrosis and xerostomia with neuroticism. The findings were statistically significant, although on the basis of such descriptive examinations it is impossible to claim that the examined psychological characteristics are the cause of the occurrence of these diseases, only that they are significantly connected with their occurrence.*

**Key words:** psychosomatic oral diseases, self-esteem, anxiety, neuroticism.

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## Introduction

Oral changes with psychosomatic aetiology are still an insufficiently confirmed and investigated subgroup of psychosomatic diseases which have long been known in medicine (1). Many of them, which are believed to be of psychosomatic character, still do not have sufficient explanation of their aetiology, or it is considered to be multicausal (2).

In their daily practice dentists frequently come across patients showing signs of different mental disorders, such as anxiety, fear and various forms of neuroticism (3-6).

Thus, the above facts implicate the need to examine the possibility of a relationship between oral and mental health, and particularly whether there are longterm negative mental changes and/or certain personality traits which may have an effect on the oral mucous membrane via psychosomatic mechanism (6, 7).

Former investigations have shown that oral symptoms of dryness and burning in the mouth are frequently understood to be significantly correlated with mental stress and other forms of neuroticism (8-12). Similar conclusions can be found in the literature in connection with the occurrence of oral lichen (13), oral parafunction (14) and bruxism (15).

Taste disorders, resulting from different mental stress and systemic changes, has mainly been described in older persons (16). Grusha et al (17) found changed sense of taste as part of the clinical characteristics of burning mouth syndrome, in association with psychophysiological causes, with which they are statistically positively correlated.

In the present study only certain psychological characteristics were chosen which are relatively frequently seen in dental surgeries, i.e. anxiety, neuroticism and self-esteem.

The psychological characteristics, anxiety and neuroticism, are known to many physicians/practitioners, who often come across them in their practice. Self-esteem is less known and is chosen because of its increasing importance in modern psychological examinations. It is a concept which is the main constituent of Rogers' theory of character, and is constructed by connotative factors, responsible for the modality of human behaviour (18). This psy-

chological category was introduced into the study with the object of showing eventual correlation with the observed oral changes.

The occurrence of oral changes, influenced by mental factors, has not been studied in Gorski Kotar or in Croatia as a whole. Due to the fact that there has not been any previous investigation which could provide basic indicators on the occurrence of such diseases and symptoms in this region, it was necessary to first determine basic data on the incidence of these changes and their distribution among people of different ages and sex.

Another aim of the study was to measure self-esteem, anxiety and neuroticism in the same subjects and to test whether any correlation exists between oral changes and the selected psychological characteristics.

## Material and methods

### Subjects

The study included 277 randomly selected adult subjects treated in dental surgeries in the region of the districts of Fužina (155 subjects - 55.9%) and Lokve (122 subjects - 44.1%). There were 150 female subjects (54%) and 127 male (45%). Age range 18 - 77 years. Mean age value for all subjects was 38.6 years (37.6 years female and 39.9 years male). Subjects were classified according to age in a younger group (18 - 49 years) and an older group (50 - 77 years). Patients who used psychotropic drugs and suffered from mental disease were excluded from the study.

### Methods

According to a previously prepared questionnaire basic data were collected for each subject and a detailed oral examination performed. For registration of oral changes, data were taken from the dental health card of each patient if the disease had occurred earlier, and recorded according to the same criteria as the changes determined during the examination. Diseases were registered according to the relevant criteria and with adequate oral testing according to Dobrenić (2). Thus, in the case of xerostomia the dental mirror was placed on the dorsum of the tongue (Vitro-AD test) and if it stuck/adhered to

the mucous membrane a positive finding was recorded. Saliva was collected by means of a glass injection syringe (SAL-test) for a period of one minute. According to the above findings patients were classified in three categories (0.4-0.5 ml = normal salivation, 0.2-0.4 ml = oligosialia, less than 0.2 ml = xerostomia). In the case of aphthous stomatitis aphthous lesions found during the examination were recorded and also those registered in the dental health card, retrospectively for six months. Stomatopyrosis was also recorded according to previously determined criteria. Subjects in whom burning did not occur spontaneously but only after stimulation were classified in low intensity. Subjects in whom the symptoms of burning occurred intermittently and intensified spontaneously were classified in medium intensity, and subjects in whom burning occurred spontaneously, was continuous and which intensified after stimulation were classified in high intensity. In the case of bruxism the presence of ground veneers was recorded, and disturbed oral mucous membrane in oral parafunctions. In the case of oral parafunctions biting of the cheek mucous membrane and lips, and pushing the tongue into the frontal teeth were recorded.

After recording the oral finding the psychological part of the examination was started in which subtests "18 PF" according to Momirović et al were used (19), by which self-esteem, anxiety and neuroticism of subjects were measured. The internal consistency of the selected subtests was checked by Kuder-Richardson's formula and amounted to 0.81 for anxiety and 0.92 for neuroticism. The mean discriminative value for anxiety was calculated by point-biserial correlation and amounted to  $r_{pb} = 0.35$  between pathological and nonpathological reactions, and for neuroticism the same value was  $r_{pb} = 0.42$ . Self-esteem was tested by questions taken from several psychotests engaged in this field. Internal consistency was measured by standardised and Cronbach alfa test, and the obtained values amounted to 0.83 and 0.82 respectively. Thus the psychological tests used had adequate psychometric value for calculation of the statistic differences between the groups with different oral pathology.

Differences with regard to sex and age of the subjects were tested by means of chi-square test. Correlation between the described oral changes and mental characteristics were tested by analysis of

variance and the results of all significant findings presented in tables and figures.

## Results

The study showed that in the area of Fuzina and Lokava oral parafunctions were most frequently determined (36.1% of subjects), followed by aphthous lesions (19.2%), bruxism (13.7%), xerostomia (12.27%) and stomatopyrosis (10.3%). Taste disorders (2.3%) and oral lichen (1.2%) were rarely found. During the study several oral pathological changes were found in the subjects and consequently they should be considered in proportions in relation to the total 100% of the examined pathology found. Thus, oral parafunctions were most frequently registered (35% out of the total number of oral changes found), followed by bruxism (22%) and recurring aphthous lesions (18%), and rarely symptoms of xerostomia (12%) and stomatopyrosis (10%). Taste disorders (2%) and oral lichen (1% of the total registered oral diseases) was extremely rare.

Table 1 shows data on the occurrence of oral diseases with possible psychosomatic aetiology in relation to age groups. The total data for all age groups were divided into two larger groups, for older and younger patients. By means of chi-square test statistically significant difference was determined in the occurrence of stomatopyrosis ( $\chi^2 = 12.29$ ,  $p = 0.007$ ,  $ss = 3$ ) and xerostomia ( $\chi^2 = 7.65$ ,  $p = 0.054$ ,  $ss = 3$ ) in older subjects and in the occurrence of oral parafunctions in younger subjects ( $\chi^2 = 7.53$ ,  $p = 0.006$ ,  $ss = 1$ ). Values of chi-square test for oral lichen and taste disorders were not analysed because of the small number of subjects, and thus this statistical method was inadequate.

With regard to sex the results showed that on the whole there were no statistically significant differences between the sexes, apart from stomatopyrosis ( $\chi^2 = 10.91$ ,  $p = 0.015$ ,  $ss = 3$ ) and recurring aphthae ( $\chi^2 = 3.94$ ,  $p = 0.45$ ,  $ss = 1$ ), which were significantly more frequent in females.

The results of the tests for self-esteem, anxiety and neuroticism were presented so that the total interval between minimal and maximal values achieved on the test were divided into five equal intervals (Table 2).

The results obtained on the test of self-esteem were mainly grouped according to higher values, which shows that a small number of subjects had a low level of self-esteem.

The value of arithmetic means of the obtained results indicates the existence of less anxiety symptoms in the examined sample.

The results obtained on the test of general neuroticism are grouped mainly towards low values, indicating that a small number of subjects showed a high level of neurotic symptoms.

Difference between the sexes exists with regard to the statistical significance of the occurrence of symptoms of anxiety in females ( $\chi^2 = 76.9$ ,  $p = 0.013$ ,  $ss = 51$ ) and neuroticism in females ( $\chi^2 = 47.54$ ,  $p = 0.413$ ,  $ss = 46$ ).

No correlation was established between the different intensities of self-esteem in our subjects and the occurrence of oral diseases.

Statistical significance correlation was determined between anxiety and recurring aphthous lesions ( $F = 4.19724$ ,  $p = 0.01574$ , stomatopyrosis ( $F = 4.19724$ ,  $p = 0.01574$ ), xerostomia ( $F = 6.23235$ ,  $p = 0.00266$ ) and bruxism ( $F = 4.77854$ ,  $p = 0.00923$ ) and stomatopyrosis ( $F = 5.03379$ ,  $p = 0.00735$ ) and xerostomia ( $F = 6.23235$ ,  $p = 0.00266$ ) in relation to neuroticism (Tables 3, 4, Figs. 1, 2).

The direction of the correlative lines in the case of oral changes and anxiety and neuroticism shows a positive correlation. In the case of anxiety, in relation to recurring aphthae and bruxism there was greater correlation at the medium level of anxiety, while correlation was slightly less at high levels of anxiety. This cannot be claimed in the case of xerostomia and neuroticism because a markedly high level of neuroticism was found in very few subjects and thus the finding is unreliable.

## Discussion

As expected the frequency of some oral diseases was diverse. However, it agrees with the findings of other authors in the literature.

Capurso (14) reported that parafunctions were most frequent in children and in patients with paradontological changes, and that they can be found in 43%

of subjects in an adult population. The number given in his study included the occurrence of other oral parafunctions, which were not examined in this study, and thus it can be said that the results conditionally agree with this finding.

The significant occurrence of bruxism (22%) is relatively difficult to compare with other studies due to the fact that different studies used different criteria (15, 20, 21). On the whole the findings of other authors were greater, which can be explained by the greater occurrence of partial or completely edentulous subjects in our study.

In our subjects the occurrence of recurring aphthae was more frequent than other changes (19.2%), observed during the oral examination, although it did not significantly differ from data found in the literature. Depending on the results of other authors engaged in investigating these diseases, the incidence of these diseases in the general population ranges from 10 to 34% in the general population (22-24).

The occurrence of reduced secretion of saliva and feeling of dryness in the mouth was determined in approximately one tenth of our patients, most frequently in a reduced form (oligosialia), and rarely as a marked lack of saliva (xerostomia). This data is difficult to compare with findings in the literature as it is described as a side effect of numerous specific diseases, while there is a lack of data on the occurrence of xerostomia in the general population. To a certain extent the results are supported in a study by I. Javorović (11), who reported intensive occurrence of these symptoms in neurotic patients and a frequent finding of a mild form of xerostomia.

The occurrence of stomatopyrosis was observed in 10.5% of our subjects. This can be compared with the finding of Dobrinić et al (9) who reported that the disease was found in 18.6% of all oral patients, i.e. almost every fifth oral patient had such disorders. The results of our study can conditionally be understood as supporting such claims, although the values found were less than those mentioned. The reason being that the present study included many healthy adults who were not oral patients, which most likely had an influence on the percentage of the occurrence of these diseases.

Taste disorders were rare, while complete loss of the sense of taste was not recorded. Changed sense

of taste is described in the literature with burning mouth syndrome or with the presence of oral lichen on the mucous membrane of the tongue. A finding of oral lichen was extremely rare, but did not differ from the findings of other authors, whose investigations comprised far larger samples (13, 27).

According to the results obtained (Table 1) it can be seen that recurring aphthae and bruxism occurred equally in older and younger subjects. Data from the literature show that bruxism is not a phenomenon which is primarily connected with the age of patients. With regard to aphthae, Rennie (23) and other authors reported that they occurred more often in younger people, which was not confirmed in the present study.

In the case of xerostomia and stomatopyrosis, significant statistical difference was found between older and younger subjects, which agrees with data in the literature (17, 22).

The results of the study show that statistical significant differences according to sex occurred in the case of stomatopyrosis and multiple occurrence of habitual aphthae, which agrees with the data from previous studies (23, 24).

The results of psychotests showed a fairly high level of self-esteem, low level of anxiety and still lower level of neuroticism in the subjects.

Analysis of the correlative relationship between oral diseases and mental factors showed a statistically significant correlation between the occurrence of xerostomia, stomatopyrosis and recurring aphthae and bruxism in relation to the occurrence of anxiety, and stomatopyrosis and xerostomia in relation to neuroticism.

This finding appears significant, although on the basis of such a descriptive study we cannot claim that the observed mental characteristics are the cause of the occurrence of these diseases, only that they are significantly connected with their occurrence. It is impossible to say decisively whether the influence of psychological factors on the occurrence of oral changes is direct or indirect through some other etiological factors. For example, the development of harmful habits such as smoking, consumption of black coffee and alcohol, or whether the psychological characteristics are themselves a reflection of social status and life style, which we find as a hypothesis in the studies of other authors (25, 26).

The results of this study clearly indicate that the observed phenomena are correlated, which can be seen in the values of the calculated coefficients of correlation, which are not high (from 0.11 to 0.21). The most probable assumption is that anxiety and neuroticism are significant catalysts in the mechanism of the occurrence of oral changes, with which they are connected, and are possibly the initiators of the occurrence itself.

Consequently, based on the findings of this study, there is a need for further investigations, particularly with regard to two aspects. Firstly, the study should be extended to other possible etiological factors, because the present study indicates the possibility of multicausal aetiology of these diseases. Secondly, the study should involve causal plan of study instead of descriptive study, which is dominant in the literature today.

## Conclusion

Oral parafunctions were most frequently found in the examined sample, followed by recurring aphthae lesions, bruxism, and then xerostomia and stomatopyrosis. The occurrence of taste disorders and oral lichen was extremely rare.

Age and sex were found to be significantly connected with the occurrence of stomatopyrosis, which occurred statistically significantly more frequently in older females, and the occurrence of xerostomia which generally occurred in older persons, and oral parafunctions, which were more frequent in younger subjects. The present study indicated that the occurrence of recurring aphthae was more frequent in females than in males.

The results of the psychotests in our subjects showed a high level of self-esteem, low level of anxiety and still lower level of neurotic symptoms.

Statistically significant positive correlation was determined between the occurrence of xerostomia, stomatopyrosis, recurring aphthae and bruxism and anxiety and between stomatopyrosis and xerostomia with the occurrence of neuroticism.

Based on the results of this study it can be concluded that examination of the above psychological characteristics is useful in those patients in whom oral changes with possible psychosomatic aetiology frequently occur.