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Study of oral changes in patients with eating disorders

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© 2008 The Authors. Journal compilation © 2008 Blackwell Munksgaard **Abstract:** *Background:* The prevalence of eating disorders is very high in industrialized countries, especially in young women. The principal orodental manifestations are erosion of the dental enamel, caries and dental sensitivity. *Objectives:* Our aim was to study oral complications in female with eating disorders. *Methods:* We study oral complications (dental, mucosal and salivary) in 17 female patients from the Hospitalized Patients Eating Disorders Unit. *Results:* We found alterations in salivary flow and pH, as well as salivary gland enlargement. *Conclusions:* A significant alteration in oral tissue occurs; this has an adverse impact on oral health, producing an accumulation of local irritants which favour the appearance of oral diseases. Preventative measures are therefore recommended for this group of patients.

Key words: eating disorders; females; oral health; oral mucosa; saliva; tooth erosion

Introduction

The prevalence of eating disorders is very high in industrialized countries, especially in young women, and has increased in recent years (1). Although the eating disorders anorexia nervosa and bulimia nervosa, and their atypical presentations, are considered mental disorders, they can also have significant consequences on oral health (2–7). The principal orodental manifestations are erosion of the dental enamel, caries and dental sensitivity. Dental erosion affects 20% of patients with anorexia nervosa, and more than 90% of those with bulimia. Given that this is an irreversible condition, its early detection and identification is important (8). Alterations in the oral mucosa and periodontal tissue have also been described. At the glandular level, sialoadenosis and alterations in saliva flow are also manifest, all of which contribute to a reduction in masticatory capacity (7).

The importance of the early diagnosis of oral complications associated with disordered eating is highly emphasized because they are the only complications that cannot be reversed (2, 3, 8).

These manifestations of the teeth and oral tissue include dental hypersensitivity, enamel erosion of lingual maxillary anteriors accompanied with sensitivity to temperature change, raised restorations above eroded tooth structure, anterior open occlusion, xerostomia, cheilosis, enlarged parotid glands, sore throat, burning of tongue, bleeding gingiva, decreased salivary flow/enlarged salivary glands and motheaten appearance of incisal edges of maxillary anterior teeth (3, 8). The role of dental practitioners in early identification, referral and case management of eating disorders is crucial; however, very little is known regarding the practitioner's knowledge of eating disorders, the associated medical complications, diagnosis and management and treatment of dental manifestations.

Our objective was to study oral alterations in a group of women with eating disorders.

Materials and methods

Eighteen patients from the Hospitalized patients Eating Disorders Unit of the Hospital de Albacete (Spain) were included in the study, being diagnosed in accordance with the American Psychiatric Association's DSM IV-R criteria (9). The study commenced on receiving approval from the ethics committee and was carried out between January and March 2004. All oral examinations were made by the same professional. An oral and extra-oral examination was made (mucosal, dental, periodontal and salivary). The presence of caries was recorded according to WHO (World Health Organization) criteria; erosions were classified according to extent and location - buccal, lingual occlusal/incisal. The DMF Index (decayed, missing and filled teeth) was recorded; the oral mucosa and periodontal tissue were also examined. To determine the state of oral hygiene, a Silness and Löe hygiene index was carried out. The evaluation of the periodontal state probing depth (PD) was measured to the nearest millimetre using a conventional periodontal probe. The deepest PD of each tooth was registered.

Circadian rhythms were taken into account, when recording salivary flow; ($\leq 0.1 \text{ ml min}^{-1}$ unstimulated and $\leq 0.5 \text{ ml min}^{-1}$ stimulated were considered pathologic). The pH was determined using a standardized kit (Cariotest[®]: GE America, Alsip, IL, USA) (normal healthy oral pH is 6–6.5). All patients were informed and gave written consent. Of the 18 patients in the eating disorders unit, one patient did not wish to participate.

Results

The age of patients varied from 13 to 32 years (average 20.12 ± 5.6). All were female. The age at onset of disease was between 9 and 21 years (average 14.47 ± 3.1). All were undergoing pharmacological treatment which affects salivary gland function (neuroleptics, antidepressants, etc.). The values obtained from the oral examinations are shown in Table 1. Regarding dental erosion, all were of Grade 1 (affecting only the enamel), the majority of which corresponded to the bulimic group (Figs 1 and 2). Regarding alteration in the salivary glands, bilateral enlargement of the parotid gland is notable in the bulimic patients (Table 2). With respect to oral hygiene, the majority reported brushing three or more times a day.

Discussion

We should be prudent in the interpretation of our results as the sample is small and limited only to women. One of the most significant effects on the oral cavity is erosion of the teeth most often exposed to acidic fluids, particularly the

Table 1. Results of examination

	Anorexic (<i>n</i> = 7)	Bulimic (<i>n</i> = 10)	Mixed group (<i>n</i> = 17)
Perioral examination			
Commisural cheilitis	0	3	3
Labial dehydration	5	7	12
Recurrent labial herpes simplex	0	2	2
Intraoral examination of soft tissues			
Buccal mucosa			
Erosions	2	11	13
Alba lines	2	3	5
Tongue			
Indentations	2	4	6
Gingiva			
Gingivitis	2	3	5
Gingival recession	1	4	5
Gingival haemorrhage	2	0	2
Presence of oral calculus	1	1	2
Palate			
Erythemas	3	2	5
Erosions	0	1	1
Oedema	2	4	6
Intraoral examination of teeth,	7.57	7.30	7.41
DMF Index (decayed,			
missing and filled teeth)			
Dental erosions from vomiting	1	7	8
Exclusively anterosuperior involvement	1	4	5
Exclusively anteroinferior involvement	0	0	0
Anterosuperior and inferior involvement	0	3	3



Fig. 1. Enamel loss due to bulimic behaviour.



Fig. 2. Severe loss of enamel due to long-standing bulimic behaviour.

Table 2. Values for statometry, pH and glandular examinatio	Table 2.	Values fo	or sialometry.	pH and	glandular	examination
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Saliva data	Anorexic $(n = 7)$	Bulimic (<i>n</i> = 10)	Mixed group (<i>n</i> = 17)
1. Signs of sialadenosis			
Enlargement of bilateral parotids	4	8	12
Enlargement of submaxillaries	0	3	3
2. Unstimulated saliva ($\leq 0.1 \text{ ml min}^{-1}$)	0	5	5
3. Stimulated saliva (≤0.5 ml min ⁻¹)	0	3	3
4. Acid pH	1	2	3
5. Neutral pH	2	2	4
6. Basic pH	4	6	10

palatal sides of the anterosuperior group. Its development could be part of a cumulative process, influenced by frequency and duration of exposure to the acid, oral hygiene, and individual vulnerability (7).

Some authors (2, 8) reported that erosion did not appear until regurgitation was present continuously for at least 2 years. Milosevic and Dawson (4) found no linear relationship between the frequency or duration of self-induced vomiting and the severity of dental erosion. Other authors found that 69% of women with bulimia nervosa had dental erosions and that furthermore they were more severely affected (3, 5). Regarding dental caries, the results of the studies were inconclusive, as the aetiology of caries was multifunctional, influenced by diet, oral hygiene and saliva.

Whilst some authors reported that these patients presented an elevated susceptibility, others did not (1, 10). The caries index found in this study was within the normal limits for their age (7). With respect to the oral mucosa; lesions were associated with nutritional deficiencies, principally iron, B vitamins and folates. It was difficult to find studies that related alterations in the oral mucosa to biochemical parameters in these patients. Mucosal lesions, erosions, fissures, glossitis and lacerations were commonly recognized as sequelae of eating disorders (11). Candidosis, angular cheilitis was described in these patients, in part caused by nutritional deficiency and in part by trauma (3).

Although, in general, the quality, quantity, buffer capacity and pH, both in basal and stimulated samples were found to be altered, these could be due principally to general conditions, such as malnutrition, anaemia and hormonal disorders, as well as to prescription medicines. In agreement with other studies (1, 6), we found a bilateral, painless, enlargement of the parotid glands in 12 cases, and of the submaxillary gland in three cases of bulimic patients; this alteration may persist for some time after the bulimia and anorexia have been reversed, or they may disappear spontaneously (3).

Additional extra-oral manifestations associated with anorexia include lanugo (growth of fine body hair) and loss of hair in the head as a result of malnutrition and loss of body fat. Those manifestations in patients with anorexia could also include weight changes ranging from being at a normal weight to being extremely thin in severe cases. Extra-oral signs manifested by behaviours associated with bulimia nervosa include enlargement of the parotid gland, growth or lipoma on extremities and erosion or inflammation of the fingernail if the finger is used to induce vomiting. Those patients with bulimia nervosa may also exhibit weights ranging from average to about 10 pounds overweight (12).

Advice for professionals and patients

As regards the increased susceptibility to both caries and erosion, patients with eating disorders should be encouraged to have dental check-ups at regular intervals, using a recall system to prevent individuals from dropping out. Improvement in the methods for prevention and treatment of erosive tooth wear is an important future research priority (11).

- The professional should emphasize the importance of regular recall visits to monitor hard-tissue loss and soft-tissue lesions.
- The dentist can provide the patient with custom-made trays and 1.1% neutral fluoride gel. The patient should use the trays for 5 min daily.
- Dental professionals should minimize the use of abrasive materials in dental treatment. Rinsing daily with 0.5% fluoride.
- The patient should not brush the teeth within 1 h of vomiting.
- Dental hygienist should instruct patients in the appropriate oral self-care techniques.
- Patients need to be educated to reduce intake of acidic drinks, and drink alternatives such as low-calorie beverages which still have erosive potential. Patients are also advised to reduce consumption of fresh fruit especially citrus fruit.

Conclusion

In conclusion, a significant alteration in oral tissue occurs; this has an adverse impact on oral health, leading to the accumulation of local irritants and hence risk of oral diseases. Preventive measures are therefore recommended for this group of patients.

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