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Oral medicine psychiatric liaison clinic: study of 1202 patients attending over an 18-year period

E. Umemura[1,2], T. Tokura[3], M. Ito[1], Y. Kobayashi[3], M. Tachibana[3], T. Miyauchi[3], T. Tonoike[4], W. Nagashima[5], H. Kimura[3], M. Arao[1], A. Sato (Boku)[6], N. Ozaki[3], K. Kurita[1]

[1]Department of Oral and Maxillofacial Surgery, School of Dentistry, Aichi Gakuin University, Nagoya, Aichi, Japan; [2]Department of Dentistry and Oral Surgery, Saisyukan Hospital, Kitanagoya, Aichi, Japan; [3]Department of Psychiatry, Nagoya University Graduate School of Medicine, Nagoya, Aichi, Japan; [4]Faculty of Psychological and Physical Sciences, Health Service Centre, Aichi Gakuin University, Nagoya, Aichi, Japan; [5]Research Centre of Health, Physical Fitness and Sports, Nagoya University, Nagoya, Aichi, Japan; [6]Department of Dental Anaesthesia, Aichi Gakuin University, Nagoya, Aichi, Japan

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Abstract. Patients with orofacial pain and discomfort often suffer from psychiatric disorders. However, few studies involving a large sample have examined the diagnostic results of patients with orofacial pain or discomfort in relation to psychiatric disorders. The purpose of this study was to summarize and clarify the characteristics and demographic data of 1202 patients attending the psychiatric liaison clinic at Aichi Gakuin University Hospital. Psychiatric diagnosis was performed by psychiatrists for all patients, based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition. Among the 1202 patients, 992 (82.5%) were female. The average age of the patients was 57.2 ± 15.0 years. The predominant broad categories of orofacial pain and discomfort seen were burning mouth syndrome (n = 484, 40.3%), persistent idiopathic facial pain (n = 258, 21.5%), and oral dysesthesia (n = 215, 17.9%). The predominant broad categories of psychiatric diagnoses seen were somatic symptoms and related disorders (n = 934, 77.7%) and depressive disorders (n = 76, 6.3%). Among the 934 patients with somatic symptoms and related disorders, 678 had a somatic symptom disorder with predominant pain. The results confirmed that most patients with orofacial pain and discomfort were middle-aged and elderly women suffering from a somatic symptom disorder with predominant pain.

Key words: liaison; burning mouth syndrome; persistent idiopathic facial pain; somatic symptom and related disorders.

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Although patients with medically unexplained oral symptoms of pain and discomfort are not rare, the number of joint psychiatric liaison–oral medicine clinics is not sufficient. Therefore, not only have most patients suffering from orofacial pain and discomfort experienced treatment in several dental offices and hospitals, but they may also have experienced treatments in several departments. As a result of symptom prolongation and treatment courses in several medical hospitals, it

becomes more difficult to determine whether the symptom is related to a physical disorder or to a psychiatric disorder.

Previous studies performed to date have been conducted to establish the relationships among orofacial pain, discomfort, and psychological factors[1,2]. A study reported in 2004 revealed that major psychiatric disorders are common among patients with temporomandibular disorders (TMD)[1]. The study also revealed that psychosocial variables are associated with symptom severity and that the indicators of psychosocial dysfunction are associated with worse treatment outcomes[1]. Other studies have investigated psychiatric diagnoses in patients with burning mouth syndrome (BMS) and atypical odontalgia (AO)[3–7]. Approximately 50% of these patients suffered from psychiatric disorders. Despite the high incidence of psychiatric disorders, it is difficult for only dentists or only psychiatrists to reach a diagnosis.

When an irreversible procedure, such as a dental extraction, is performed on a patient with orofacial pain, the symptom sometimes gets worse rather than better. Accordingly, these unexplainable oral symptoms are better managed not only by dentists but also by psychiatrists. At the oral medicine psychiatric liaison clinic of Aichi Gakuin University Hospital (AGUH), dentists and psychiatrists collaborate not only at the first visit, but also at every appointment. The dentists assess the patient for any organic disease in the oral region at every appointment. The psychiatrists mainly perform a psychiatric assessment and provide psychotherapy and psychopharmacotherapy to the patients. Previous studies reported by the present authors' clinic group have identified the characteristics of BMS patients[8] and the pain-relieving effects of milnacipran[9,10] and duloxetine[11,12] and their relationships to plasma levels among patients with BMS and persistent idiopathic facial pain (PIFP).

It appears that no study has reported psychiatric diagnosis performed by psychiatrists among the broad categories of orofacial pain and discomfort. The purpose of this study was to summarize and clarify the characteristics and demographic data of 1202 patients with medically unexplained oral symptoms of pain or discomfort attending the psychiatric liaison clinic at AGUH.

Materials and methods

In 1999, a psychiatric liaison clinic group was established at AGUH for the diagnosis and treatment of patients with orofacial pain and discomfort. Since its establishment, the clinic has invited psychiatrists from Nagoya University Hospital Department of Psychiatry[13]. On the occasion of the 18th anniversary of the establishment of this medical group, retrospective statistical clinical surveys were performed that included 1202 patients attending for the first time between January 1999 and December 2016.

All patients were referred from inside and outside the hospital, after organic dental/oral disease was excluded. At the first visit, the patients were examined by psychiatrists and dentists at the same appointment. Psychiatric diagnoses were made based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)[14]. Patients who visited the liaison clinic before 2013 were originally diagnosed based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)[15]. However, for this study the psychiatric diagnoses of these patients were recategorized based on DSM-5 13 through a review of each patient's clinical records.

BMS is currently defined as an intraoral burning or dysesthesia sensation, recurring daily for more than 2 hours per day over a period of more than 3 months, without clinically evident causative lesions[16]. PIFP is currently defined as persistent facial and/or oral pain, with varying presentations, but recurring daily for more than 2 hours per day over a period of more than 3 months, in the absence of a clinical neurological deficit[16]. The term AO is used when chronic pain is felt in a tooth region. AO is considered a subtype of PIFP[16]. Therefore, patients diagnosed with AO were later included in the PIFP category in this study. In this study, patients with actual taste disorders resulting from zinc and vitamin deficiencies were excluded from the taste disorder cases by filter paper method and blood tests[17].

Results

Among the 1202 patients, 992 (82.5%) were female and 210 (17.5%) were male. The ratio of female to male patients was 4.7:1. The patients ranged in age from 8 to 90 years (Fig. 1); the average age of all patients was 57.2 ± 15.0 years. The average age of male patients was 54.0 ± 16.5 years and of female patients was 57.9 ± 14.6 years. Accordingly, most patients were female in the middle-age and elderly age groups.

The dental diagnoses made in all patients are presented in Table 1. More than 60% were associated with pain. Significantly, a certain proportion of patients who had been referred to the clinic with the comment of 'no actual disease' actually had a definite disease. Among the 1202 patients, 47 (3.9%) had an observable organic disease and 61.7% of them were found not to be suffering from any psychiatric disease. This indicates that 2.4% of patients were wrongly referred to the liaison clinic.

The broad categories of psychiatric diagnoses for all patients seen are presented in Table 2. It was found that 934 (77.7%) of the patients suffered from 'somatic symptoms and related disorders'. Somatic symptom disorder with predominant pain, which is a subtype of somatic symptom disorder, accounted for 56.4% of the total patients ($n = 678$), 84.9% of the BMS patients, and 89.1% of the PIFP patients. The second most common subtype in the somatic symptoms and related disorders diagnosis category was conversion disorder, which accounted for 16.3% of the patients. After somatic symptoms and related disorders, patients with no psychiatric disease accounted for 6.9% ($n = 83$), those with depressive disorders accounted for 6.3% ($n = 76$), and those with anxiety disorders accounted for 3.5% ($n = 42$).

Among the 76 patients with depressive disorders, 74 had a major depressive disorder and two had an unspecified depressive disorder. Among the 42 patients with anxiety disorders, 19 had a specific phobia, 11 had a panic disorder, five had a social anxiety disorder, and one had an unspecified anxiety disorder; the remaining six were categorized as having 'other' anxiety disorders. Among the 38 patients diagnosed with 'schizophrenia spectrum and other psychotic disorders', 24 were diagnosed with schizophrenia, nine with a delusional disorder, four with an unspecified schizophrenia spectrum and other psychotic disorder, and one with a schizophreniform disorder.

The psychiatric diagnoses were also examined from the view of major orofacial pain and discomfort for BMS, PIFP, and oral dysesthesia separately. The broad categories of psychiatric diagnoses seen in BMS patients are presented in Table 3. Among the 484 patients with BMS, 440 (90.9%) were categorized under 'somatic symptoms and related disorders'. Among these 440 patients, 415 had a somatic symptom disorder and 22 had a conversion disorder. Somatic symptom disorder with predominant pain accounted for 84.9% ($n = 411$) of all BMS patients.

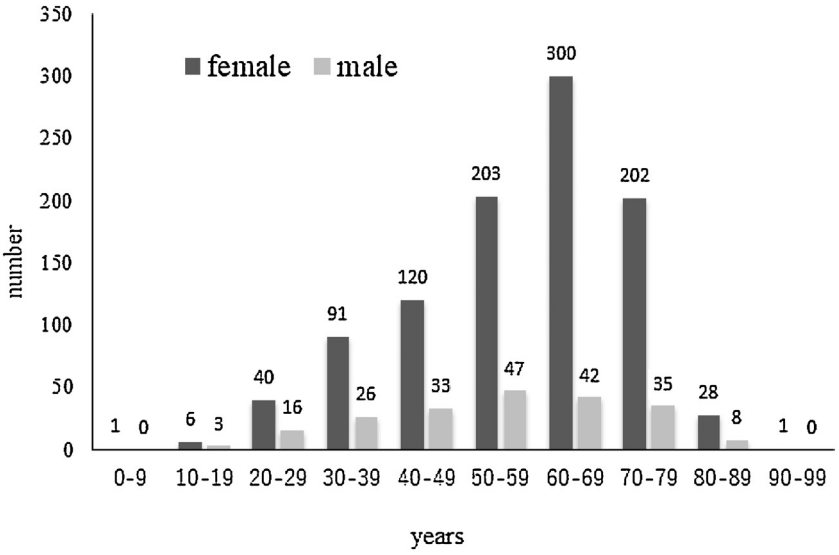

Fig. 1. Distribution of patients by age group.

Table 1. Broad categories of dental diagnoses for all patients.

Oral psychosomatic disorder	Number of patients	Percentage
Burning mouth syndrome	484	40.3
Persistent idiopathic facial pain	258	21.5
Oral dysesthesia	215	17.9
Temporomandibular disorder	72	6.0
Taste disorder	48	4.0
Actual dental disease	47	3.9
Dental phobia	26	2.2
Xerostomia	25	2.1
Trigeminal neuralgia	10	0.8
Occlusal discomfort syndrome	10	0.8
Halitosis	7	0.6
Total number of patients	1202	100

The broad categories of psychiatric diagnoses seen in patients with PIFP are presented in Table 4. Among the 258 patients with PIFP, 238 (92.2%) were categorized under 'somatic symptoms and related disorders'. Among these 238 patients, 232 had a somatic symptom disorder and six had a conversion disorder. Somatic symptom disorder with predominant pain accounted for 89.1% ($n = 230$) of all PIFP patients.

The broad categories of psychiatric diagnoses seen in patients with oral dysesthesia are presented in Table 5. Among the 215 patients with oral dysesthesia, 157 (73.0%) were diagnosed with 'somatic symptoms and related disorders'. Among these 157 patients, 118 had a conversion disorder and 37 had a somatic symptom disorder.

The broad categories of psychiatric diagnoses for patients with actual dental disease are presented in Table 6. Among the patients with actual dental disease, inflammation was predominant. The largest number of patients had chronic apical periodontitis, followed by glossitis. Among the 47 patients with actual dental disease, 30 were found to have no psychiatric disease. Seven were diagnosed with 'somatic symptoms and related disorders', four with depressive disorders, and three with anxiety disorders. The largest proportion of patients suffering from actual organic dental disease did not have any psychiatric disease, meaning that actual dental disease was 'simply' overlooked. Among the patients suffering from psychiatric disease, two main groups were identified. One was the group of patients with somatic symptoms and related disorders. In these cases there were symptoms caused by actual organic dental disease, but the patient's complaints exceeded the symptoms of the actual organic dental disease in some cases or there was too much emphasis on their complaints in other cases. Thus, the dentists overlooked the actual organic dental disease in these patients due to their assessment of a lack of actual organic dental disorder to rationally explain the level of ailment. The second group was the patients with depressive disorders, anxiety disorders, and others, which are frequently comorbid with physical symptoms such as pain. The presence of these mental diseases may have caused the dentists to overlook the actual organic dental disease, either because they assessed such complaints as mental disease, or the mental disease itself prevented a decent consultation.

Discussion

This study is novel in that a psychiatric diagnosis was performed for all patients by psychiatrists using DSM-5[14], which is an international standard of psychiatric diagnosis. The study has four unique features: (1) it spans a long duration of 18 years, (2) it involves a large number of patients – 1202 cases, (3) it reveals the importance of the dentist considering the possibility of a psychiatric disease when no organic problem is found, and (4) it presents the effectiveness of a liaison clinic, with collaboration between dentists and psychiatrists.

The results of this study are consistent with those of a previous study that reported a high female to male ratio among patients with non-organic dental disorders such as BMS[18]. Menopausal disorder is thought to be one of the contributing factors. Wardrop et al. showed an association between oral discomfort and psychological symptoms in menopausal women[19]. An explanation for this association is the biological decrease in female hormones. Gao et al. found that menopausal women with BMS had higher follicle stimulating hormone levels and lower oestradiol levels than those without oral symptoms[20]. The psychological stress of taking care of their parents and those of their spouse, as well as signs of body decline accompanying the menopausal disorder, are thought to be the related to psychosocial causes.

The prevalence rate of BMS is estimated to be between 0.7% and 15%[18]. Although the mechanism is as yet unknown, the possibility of neuropathy involving the central nervous system has been indicated as the cause of the pain[21].

A report has been published that indicates a rate of occurrence of AO in patients who have received endodontic treatment of between 3% and 6%[22]. The mechanism of this disease is also as yet unknown. It appears that no study has reported prevalence rates of BMS and PIFP in a liaison clinic; hence the results of this study are novel.

Table 2. Broad categories of psychiatric diagnoses based on DSM-5 for all patients[14].

Psychiatric diagnosis	Number	Percentage
Somatic symptoms and related disorders	934	77.7
Somatic symptom disorder	727	60.5
Somatic symptom disorder with predominant pain	678	56.4
Conversion disorder	196	16.3
Illness anxiety disorder	4	0.3
Unspecified somatic symptom and related disorder	4	0.3
Psychological factors affecting other medical conditions	3	0.2
Depressive disorders	76	6.3
Major depressive disorder	74	6.2
Unspecified depressive disorder	2	0.2
Anxiety disorders	42	3.5
Specific phobia	19	1.6
Panic disorder	11	0.9
Social anxiety disorder	5	0.4
Unspecified anxiety disorder	1	0.1
Other	6	0.5
Schizophrenia spectrum and other psychotic disorders	38	3.2
Schizophrenia	24	2.0
Delusional disorder	9	0.7
Unspecified schizophrenia spectrum and other psychotic disorder	4	0.3
Schizophreniform disorder	1	0.1
Personality disorders	7	0.6
Bipolar and related disorders	5	0.4
Obsessive/compulsive and related disorders	4	0.3
Medication-induced movement disorders and other adverse effects of medication	4	0.3
Neurodevelopmental disorders	3	0.2
Neurocognitive disorders	2	0.2
Trauma- and stressor-related disorders	1	0.1
Feeding and eating disorders	1	0.1
Sleep–wake disorders	1	0.1
(No psychiatric disease found)	83	6.9
(Patient declined psychological diagnosis)	1	0.1
Total number of patients	1202	100

DSM-5, Diagnostic and Statistical Manual of Mental Disorders, fifth edition.

Table 3. Broad categories of psychiatric diagnoses based on DSM-5 for patients with burning mouth syndrome.

Psychiatric diagnosis	Number	Percentage
Somatic symptoms and related disorders	440	90.9
Somatic symptom disorder	415	85.7
Somatic symptom disorder with predominant pain	411	84.9
Conversion disorder	22	4.5
Illness anxiety disorder	3	0.6
Depressive disorders	28	5.8
Anxiety disorders	5	1.0
Bipolar and related disorders	2	0.4
Schizophrenia spectrum and other psychotic disorders	1	0.2
Personality disorders	1	0.2
Medication-induced movement disorders and other adverse effects of medication	1	0.2
Neurocognitive disorders	1	0.2
(No psychiatric disease found)	4	0.8
(Patient declined psychological diagnosis)	1	0.2
Total number of patients	484	100

DSM-5, Diagnostic and Statistical Manual of Mental Disorders, fifth edition.

In accordance with the diagnostic criteria and comments of the International Association for the Study of Pain (IASP), both BMS and AO are now taken into consideration in the context of syndromes that are comorbid with xerostomia, abnormal sensation, taste change, accompanying chronic widespread pain or irritable bowel syndrome, or complicated by psychiatric diseases and psychosocial incidents. Through thorough medical interview, it was revealed that the patients attending the clinic at AGUH suffered from multiple symptoms; however the cause of their disease was recognized as BMS or AO. This information may help towards elucidating the mechanisms of BMS and AO in the future.

Previous studies have investigated psychiatric diseases that are comorbid with BMS and AO[3–7]. However, each of these studies has had its limitations, particularly regarding the study design and number of cases. For example, in the study by Nicholson et al., approximately half of the BMS patients were found to be suffering from some kind of psychiatric disease[3]. However, their study was a pilot study that included only 14 patients. Furthermore, diagnosis was not based on the DSM and there were no details regarding the number of psychiatric diagnoses. The study performed by de Souza et al. reported that 46.7% of BMS patients were suffering from a current major depressive disorder after being examined by Mini-International Neuropsychiatric Interview (MINI)[5]. MINI is a short structured diagnostic interview and easy to use as a screening tool. However, as its sensitivity is set high and the differential diagnosis is not definitive but suggestive, it is known that it tends to lead to overdiagnosis[23]. Thus, the result needs to be interpreted carefully. The studies conducted by Takenoshita et al. and Miura et al. investigated psychiatric diseases in both BMS and AO patients[6,7]. However, the patient diagnoses were made by surveying the medical records and referral forms; they were not made by psychiatrists. In the study by Bogetto et al., 106 BMS patients were diagnosed using DSM-IV, and the reported result was that ‘‘BMS was diagnosed as pain disorder in almost all patients’’[4]. The diagnostic criteria for ‘pain disorder’ in DSM-IV are now included in ‘somatic symptom disorder with predominant pain’ in DSM-5. In the present study, 84.9% of BMS patients were diagnosed as having a ‘somatic symptom disorder with predominant pain’, which is in agreement with their report.

Table 4. The broad categories of psychiatric diagnoses based on DSM-5 for patients with persistent idiopathic facial pain.

Psychiatric diagnosis	Number	Percentage
Somatic symptoms and related disorders	238	92.2
Somatic symptom disorder	232	89.9
Somatic symptom disorder with predominant pain	230	89.1
Conversion disorder	6	2.3
Anxiety disorders	7	2.7
Depressive disorders	5	1.9
Schizophrenia spectrum and other psychotic disorders	3	1.2
Personality disorders	1	0.4
Bipolar and related disorders	1	0.4
Neurodevelopmental disorders	1	0.4
Neurocognitive disorders	1	0.4
(No psychiatric disease found)	1	0.4
Total number of patients	258	100

DSM-5, Diagnostic and Statistical Manual of Mental Disorders, fifth edition.

Table 5. Broad categories of psychiatric diagnoses based on DSM-5 for patients with oral dysesthesia.

Psychiatric diagnosis	Number	Percentage
Somatic symptoms and related disorders	157	73.0
Conversion disorder	118	54.9
Somatic symptom disorder	37	17.2
Psychological factors affecting other medical conditions	1	0.5
Unspecified somatic symptom and related disorder	1	0.5
Schizophrenia spectrum and other psychotic disorders	29	13.5
Depressive disorders	17	7.9
Medication-induced movement disorders and other adverse effects of medication	3	1.4
Personality disorders	2	0.9
Anxiety disorders	2	0.9
Obsessive/compulsive and related disorders	1	0.5
(No psychiatric disease found)	4	1.9
Total number of patients	215	100

DSM-5, Diagnostic and Statistical Manual of Mental Disorders, fifth edition.

Table 6. Broad categories of psychiatric diagnoses based on DSM-5 for patients with actual dental disease.

Psychiatric diagnosis	Number	Percentage
Somatic symptoms and related disorders	7	14.9
Somatic symptom disorder	4	8.5
Conversion disorder	1	2.1
Psychological factors affecting other medical conditions	1	2.1
Unspecified somatic symptom and related disorder	1	2.1
Depressive disorders	4	8.5
Anxiety disorders	3	6.4
Schizophrenia spectrum and other psychotic disorders	1	2.1
Personality disorders	1	2.1
Neurodevelopmental disorders	1	2.1
(No psychiatric disease found)	30	63.8
Total number of patients	47	100

DSM-5, Diagnostic and Statistical Manual of Mental Disorders, fifth edition.

The epidemiological characteristics of oral dysesthesia are still under discussion. However, many of the cases can be explained by psychological aspects with physical symptoms of disease, such as somatic symptoms and related disorders, schizophrenia spectrum and other psychotic disorders, and depressive disorders. Many cases of oral cenesthopathy can be categorized as schizophrenia spectrum and other psychotic disorders according to DSM-5.

The prevalence of TMD is between 9.9% and 11.7%[24]. At 6.0%, the prevalence rate found in the clinic at AGUH was relatively lower than the general. AGUH has a TMD outpatient clinic for the specific treatment of TMD patients. Accordingly, the TMD patients in this study were those whose comorbid psychiatric disorders or psychosocial factors had a strong relationship to the origin and the process of the disease. This is the reason why the percentage of TMD patients attending the liaison clinic was small.

The prevalence of taste disorder is 10.6% among adult Americans[25]. The prevalence of taste disorder in the clinic at AGUH (4.0%) was found to be relatively lower than the general.

There were patients in whom dental disease was actually found: 3.9% of the patients attending the liaison clinic had an actual dental disease. This was higher than expected. A possible explanation for this is that almost all of the patients attending the clinic were referred from other departments or hospitals. Among these patients, inflammation was predominant. In some of the cases, the complaints of the patient were inconsistent with the organic disease. There were cases that originated in dental treatments. There were also cases in which the symptoms became worse following the dental procedures. Several dental treatments are irreversible, such as extraction. Therefore, careful dental diagnosis and precise treatment are important.

The psychiatric diagnosis of dental phobia is a 'specific phobia' under the category of 'anxiety disorders'. It has been estimated that 50 to 80% of adults in the United States have some degree of dental anxiety and 6.82% feel high dental anxiety[26]. Another study in Germany revealed that 11% of adults feel intense dental anxiety[27]. At AGUH, patients with dental phobia receive dental treatment under sedation or general anesthesia in each department. This is the reason for the small percentage of patients with dental phobia attending the liaison clinic.

In DSM-5, 'somatic symptoms and related disorders' encompasses ''a cluster of patients who have distressing somatic symptoms along with excessive thoughts, feelings, or behaviors related to the somatic symptoms or associated health concerns''[14]. In a significant number of cases, patients complaining of problems with their tooth or tongue do not actually have any organic problem. Furthermore, in a significant number of cases, patients who receive a dental treatment find that the treatment does not ease their suffering at all. These circumstances often lead to

the development of psychological problems accompanied by a longer duration of the symptoms to be cured. 'Somatic symptom disorder with predominant pain' was the leading diagnosis among all patients, BMS patients, and PIFP patients. This indicates that psychosocial factors could make the symptoms worse. According to DSM-5, conversion disorder is diagnosed in a patient with the following characteristics: (1) one or more symptoms of altered voluntary motor or sensory function, (2) a condition in which patients shows psychological stress in physical ways, and (3) the symptom or deficit is not better explained by another medical or mental disorder[14]. The condition was so named to describe a health problem that starts as a mental or emotional crisis and converts to a physical problem. Patients may become paralyzed after dental treatment, even though they were not physically injured.

Patients who could not be categorized under any psychiatric diagnosis represented the second most common group among all those diagnosed for psychiatric disorders. This was an unexpected finding of this study. It is easy to diagnose a patient with a disease when he/she has obvious symptoms and test results. However, when he/she does not, it becomes difficult to diagnose patients with unknown symptoms. Therefore, it is actually difficult to reach a diagnosis in the absence of any actual disease.

According to DSM-5, the common feature of all depressive disorders is the presence of a sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function[14]. Surveys of the Japanese population conducted in 2002–2003 found rates of major depressive disorders reaching 2.2% in the previous 12 months and 6.1% as lifetime prevalence[28]. A survey of the American population revealed a 12-month prevalence of 7.0%[29]. The study revealed that a person in the general population with a history of any orofacial pain and discomfort has a high chance of developing a major depressive disorder. A previous study by the present authors' group showed that BMS patients had a higher tendency to suffer depressive symptoms than participants in the control group[8]. This tendency was suggested by the Beck Depression Inventory (BDI) – an evaluation scale of depressive symptoms – as BMS patients scored significantly higher BDI scores than the control group participants. Surveys of the Japanese population conducted in 2002–2003 found rates of bipolar disorder in the previous 12 months reaching 0.1%[28]. The percentage of patients with a bipolar disorder in the liaison clinic of AGUH was similar.

Patients with anxiety disorders suffer from excessive worry or fear. Even though the patient may realize that it is excessive, they may have difficulty controlling this worry or fear, and it could negatively affect their daily lives. Specific phobia is a subtype of anxiety disorders. Surveys of the Japanese population conducted in 2002–2003 found a rate of specific phobia of 2.7% for the previous 12 months[28]. Anxiety disorders may lead to a tendency to avoid seeing doctors, due to the feeling of excessive fear of being diagnosed with any psychiatric disorder or receiving any treatment. Schizophrenia spectrum and other psychotic disorders are psychiatric disorders that cause abnormal thinking and perceptions. Patients with psychotic symptoms lose touch with reality. Two of the main symptoms are delusions and hallucinations. The results of the present study are consistent with those of a previous study that reported a prevalence of schizophrenia in AO patients at a psychosomatic dentistry clinic of 1.8%[7].

This study clarified the data on dental and psychiatric diagnoses among 1202 patients who visited a psychiatric liaison clinic. It appears that no study has performed psychiatric diagnoses on all patients, with a number of over 1000 patients, and by psychiatrists using DSM-5, which is the international psychiatric diagnostic standard. Dentists and psychiatrists collaborate and examine the patient at every appointment. Therefore, the risk of reaching an incorrect diagnosis becomes minimal in this clinic. It is believed that this report will help lead to improved disease diagnosis and better patient outcomes. However, it should be noted that this study has limitations. Twelve-month and lifetime prevalence rates have been examined among several psychiatric diagnoses of the general population. However, evaluations of other departments besides the liaison clinic have not been conducted, because reports of prevalence rates are limited. Additionally, only the patient's first presentation for medical examination and treatment was evaluated in our study. Following further examination, the psychiatric diagnosis changed in several cases, but this change in diagnosis was not considered.

Almost 80% of the patients in this study with medically unexplained oral symptoms of pain or discomfort were found to fulfil the diagnostic criteria for BMS, PIFP, or oral dysesthesia. Most of these patients also met the diagnostic criteria for psychiatric disorders. The results demonstrate that although the patients appeared to have medically unexplained symptoms, they fulfilled certain diagnostic criteria and could therefore be considered for intervention.

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Competing interests

None.

Ethical approval

This study was approved by the Ethics Committee at Aichi Gakuin University (Approval No. 510).

Patient consent

Not required.

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Address:
Eri Umemura
Department of Oral and Maxillofacial Surgery
School of Dentistry
Aichi Gakuin University
2-11 Suemori-dori
Chikusa-ku
Nagoya 464-8651
Japan
Tel./Fax: +81 52 759 2157
E-mail: erimakilondon@gmail.com