

## Evaluation of Problems in Diagnosis and Treatment Process of Oral and Maxillofacial Pains

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### ABSTRACT

**Objectives:** The aim of this study was to determine the extent of diagnostic and therapeutic problems in oral and maxillofacial pain.

**Study design:** In this cross-sectional study, 88 patients with oral, and maxillofacial pain, who had previously been examined by clinicians were reviewed. The data about diagnostic delay, number and nature of previous consultations, and previous paraclinical tests, and treatments were obtained. ANOVA with Tukey test and Fisher's exact test were used to determine correlations between variables.

**Results:** 88 patients with a mean age of  $47/10 \pm 16/51$  and mean pain intensity of  $4/3 \pm 1/17$  were interviewed. In most cases, the professional delay was less than 3 months (53.4%). The mean number of referring was  $4/42 \pm 3/40$  and the most common diagnosis was atypical facial pain (29/5%). In 46/6% of cases, the general dentist was the therapist and in 62.5% of the cases, diagnostic aids were not used, however, in 15/9% of cases, medical treatment was performed. Data analysis showed that there was a significant relationship between final diagnosis with gender, age, and location of pain.

**Conclusions:** Patients with oral and maxillofacial pain are frequently misdiagnosed, leading to prescription of ineffective medications and unnecessary investigations and surgical interventions. Educational efforts should focus on improving knowledge of this area.

**Keywords:** Misdiagnosis, Dentistry, Medical errors, Maxillofacial pain

**Abbreviations:** BMS: Burning Mouth Syndrome; ENT: Ear and Nose and Throat; TMJ: Temporomandibular Joint; VAS: The Visual Analogue Scale

### INTRODUCTION

Despite various studies on the prevalence of oral and facial pain, due to the multiplicity of sources and symptoms of pain, accurate information on prevalence and incidence is not available [1]. Most studies have examined the prevalence and incidence of oral and maxillofacial pain by completing a questionnaire in people who have a history of these pains in the mouth, jaw, and face. The results of these studies have shown that the prevalence of these pains in developed societies varies between 10 and 26% [2,3].

Feeling unwell due to chronic pain can have a profound effect on a person's mental health and daily life; changes in emotions, perceptions, and movements, as well as decreased activities and social interactions, are among these effects. According to various studies, the incidence of morbidity caused by pain has been measured at an average of 20 to 45%, which was 11% in Canada and the United Kingdom, 40% in Sweden, 2-25% in the United States, and 14-24% in

New Zealand [4]. Given the prevalence of oral and facial pain and the broad effects it has on patients' quality of life, the prevention, diagnosis, and treatment of these patients will have a significant impact on improving general health [5,6]. However, assessing pain is difficult because of its mental nature. Studies show that oral and facial pain can easily be thought of as the pain of dental origin that leads to incorrect treatment by dentists [7]. In many cases, general dentists are the first to see these patients. Therefore, the

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diagnosis and treatment performed by them are of special importance. Lack of knowledge of dentists about the signs and symptoms of neurological, psychological, and even ear, nose, and throat pain, as well as the inability to find the connection between radiographic and clinical findings and medical and dental history, can lead to diagnosis and treatment problems including delays in diagnosing and treating the patient, inadequate referral, unnecessary diagnostic aids usage, and incorrect or unnecessary treatment measures [8]. This study aimed to evaluate the problems of the diagnosis and treatment process in oral, and maxillofacial pain by dentists.

## METHOD

In this cross-sectional study, all patients referred to educational-medical centers in Rasht with complaints of oral, jaw, and facial pain, who had previously been examined by physicians, general, or specialist dentists, were eligible to participate. The study was approved by the Ethics Committee of Guilan University of medical sciences (IR.GUMS.REC.1399.644) and patients were included in the study after providing signed informed consent. While entering demographic information such as age and gender, the author interviewed patients and recorded the information including the onset of symptoms, location and intensity of pain, time of the first consultation with a physician, number of visits, diagnoses, paraclinical tests and interventions received. The accuracy of each diagnosis was checked and confirmed by an oral medicine specialist and a neurologist or, if necessary, in consultation with other medical and dental professionals. In this study, the VAS scale was used to determine the intensity of pain so that patients attributed a number from 0 to 10 (zero without pain and 10 for most intensive pain) to their pain. The time between the first visit with chief complaint of oral, maxillofacial pain until receiving the final and definitive diagnosis was considered a professional delay. The researcher also reviewed the patient's records and referral letters to address bias caused by the patient not remembering information. The treatments performed before receiving the final diagnosis were classified into four categories: without treatment, correct, incorrect, and unnecessary, based on the patient's history and oral medicine specialist's assessment.

For statistical analysis, mean and standard deviation were used to describe quantitative data, and frequency and percentage were used to describe qualitative data. In addition, suitable descriptive tables and graphs were used for both measurement scales. Kolmogorov Smirnov test was used to check for normality and the Levene test was used to check the homogeneity of variances. To analyze the quantitative variables, due to the relevant assumptions, the analysis of variance (ANOVA) with Tukey pairwise comparisons was used. Fisher's exact test was used to analyze the qualitative variables. SPSS software version 26 (IBM Corp., Armonk, NK, USA) was used for data analysis, and a value of  $P < 0.05$  was considered significant.

## RESULTS

### Patients' demographic characteristics

A total of 88 patients met the inclusion criteria and were included in the study. The sample was composed of 58 females (65.9%) and 30 (34.1%) males, with a mean age at presentation of 47 years (range 10-85 years).

### Pain distribution and characteristics

The pain was localized to intraoral sites in 73.9% of the patients ( $n = 65$ ), whereas it affected extraoral sites, with variable distribution, in 26.1% ( $n = 23$ ). Atypical facial pain was most common in extraoral pain and BMS was most common in localized and intraoral pain ( $p < 0.001$ ). The maximum pain intensity score in patients was 9 and the minimum was 3. No significant difference was observed in pain intensity scores in males compared with females. Considering the whole study group, the average pain intensity score was  $4.30 \pm 1.17$ .

### Diagnostic experience and delay

About 53% of patients reported that they consulted a health care professional regarding their pain within less than 3 months of the onset of pain. Overall, the amount of time elapsed between the onset of pain to the correct diagnosis (i.e., professional delay) ranged from 1 to 12 months (Table 1). Overall, the delayed diagnosis did not differ significantly between males and females ( $P > 0.05$ ), and no significant correlation was observed between the pain intensity score or the age of patients and the amount of time elapsed between the onset of pain and the correct diagnosis.

**Table 1.** Diagnostic delay distribution among patients.

Diagnostic delay	Number	Percentage
< 3 months	47	53.4
3-6 months	17	19.3
6-9 months	9	10.2
9-12 months	3	3.4
$\geq 12$ months	12	13.6

Overall, the average number of health care professionals consulted before the pain was correctly diagnosed was  $4.42 \pm 3.40$  (range 2-21). There were no significant differences in the number of health care professionals consulted between patients with intraoral pain and those with extraoral pain or between males and females ( $P > 0.05$ ). General dental practitioners were the most commonly consulted health care professionals ( $n = 41$ ; 46.6%), followed by general medical practitioners ( $n = 23$ ; 26.1%); ear, nose, and throat (ENT) surgeons ( $n = 6$ ; 6.8%); periodontists ( $n = 5$ ; 5.7%);

neurologists ( $n = 3$ ; 3.4%); internists ( $n=3$ ; 3.4%) also there were patients visited by ophthalmologists, maxillofacial surgeons, rheumatologists and other dental professionals.

37.5% of patients underwent paraclinical examinations before the correct diagnosis. Multiple and repeated intraoral and extraoral radiographic examinations were the most common type of investigations ( $n = 23$ ; 26.1%). Other investigations included computed tomography, brain magnetic resonance imaging, sialography, and biopsy (Figure 1).

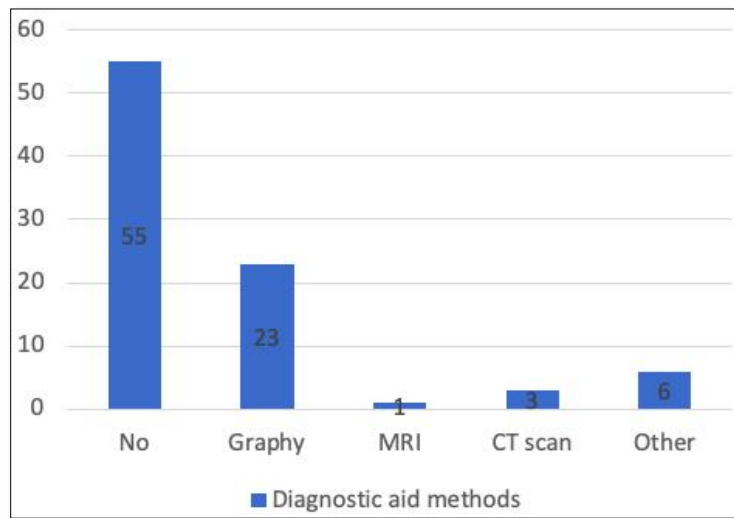


Figure 1. Diagnostic aid methods frequency among patients.

Based on the final diagnosis, results indicated that the most common diagnostic problem among patients was atypical facial pain followed by burning mouth syndrome ( $n=24$ ; 27.3%), ulcers and oral lesions ( $n=14$ ; 15.9%), TMJ disorders ( $n=8$ ; 9.1%), neuralgia ( $n=3$ ; 3.4%) and other complications (14.7%). Overall, the final diagnosis differed significantly between males and females ( $P < 0.05$ ) (Table

2). Results also show a significant correlation between final diagnosis and age ( $P < 0.05$ ); patients with oral lesions and ulcers have a higher mean age ( $p=0.009$ ) while TMJ disorder patients show a younger age category ( $p=0.012$ ). overall, no significant result was indicated between final diagnosis and pain intensity.

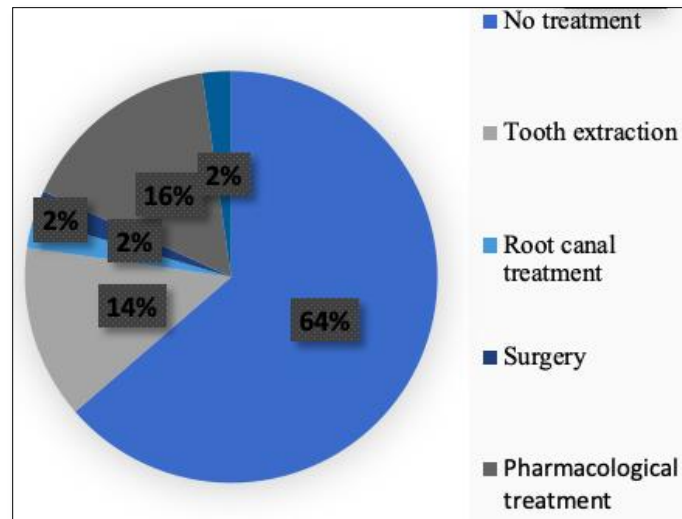
Table 2. comparison of pain types based on gender among patients.

Final diagnosis	Gender		Fisher's exact test	p-value
	Male Frequency (%)	Female Frequency (%)		
Pulpitis	0 (0)	1 (1/7)	18/57	0/002
Neuralgia	2 (6/7)	1 (1/7)		
Atypical facial pain	12 (40)	14 (24/1)		
TMJ disorders	5 (16/7)	3 (5/2)		
Ulcers and oral lesions	6 (20)	8 (13/8)		
BMS	1 (3/3)	23 (39/7)		
Other	4 (13/3)	8 (13/8)		

### Therapeutic attempts

32 patients (36.4%) underwent surgical or dental interventions. according to the results of this study, the most common treatment has been medication prescription (**Figure 2**). There was neither a significant relationship between treatment and sex nor age. Also, no correlation was observed

between treatment and pain location or pain intensity. Furthermore, out of 32 patients who underwent treatment, 3 (9.4%) received correct treatment and 26 received incorrect or unnecessary treatment. In 3 patients, due to lack of evidence before and after treatment, the accuracy and necessity of treatment could not be determined.



**Figure 2.** Treatment types distribution among patients.

### DISCUSSION

In the present study, the patients were asked about the period between onset of pain and consulting a practitioner and the results indicate that the highest frequency was contacting a therapist within three months of pain onset, however, nearly half of the patients had postponed the consultation to more than three months from the onset of the pain. In explaining the problem of delayed diagnosis and treatment, we can refer to two stages, which include the delay related to the patient (the time elapsed from the onset of pain to the visit) and the delay related to the doctor (the delay from the patient's visit to the final diagnosis). Like cancers or autoimmune diseases, most of the delay is related to the first stage and late visitation of the patient, while in the case of orofacial pain, this delay is mostly related to the second stage and professional mistakes of the medical staff [9]. The current study suggests that the patients underwent an average number of four consultations prior to the final diagnosis. To explain the high number of visits and delay in diagnosis, we can point to reasons such as nonspecific symptoms and clinical similarity of many facial pains, unknown origin, uncertain diagnostic criteria, and low prevalence of these pains in the population. Also, insufficient knowledge and lack of adequate training in the courses of physicians and dentists in the field of symptoms of oral and maxillofacial pains and their differential diagnoses, and incorrect referrals can be other factors influencing diagnostic delay [10,11]. In the present study, it was found that most patients seeking health care for oral and maxillofacial pain consult multiple professionals. General

dentists, general practitioners, specialist doctors and finally specialist dentists were respectively the most frequent consultants. So, it can be said that due to the overlap of clinical symptoms, the definitive diagnosis of oral and maxillofacial pain is very difficult and requires interdisciplinary cooperation, that allows practitioners to reach a final and definitive diagnosis by eliminating differential diagnoses [10,12]. Oral medicine is a specialty that is closely related to oral and maxillofacial pains, however, according to the current and previous studies, there is a lack of familiarity with this specialty among the Iranian population and even medical personnel, which can lead to incorrect referrals that can be a factor in delaying the diagnosis and treatment of these patients. The results of the present study showed that the most common diagnostic problems in terms of final diagnosis of pain were atypical facial pain, BMS, and then pain due to wounds and oral lesions respectively. To address the cause of these problems, we can point to the non-specific symptoms and clinical similarity of many oral pains and also, insufficient knowledge of medical practitioners and dentists about the symptoms of different oral and maxillofacial pains [13]. The results of the present study marked that there is a significant difference between the final diagnosis of oral and maxillofacial pain with background variables. There was a significant difference between the mean age of patients with temporomandibular joint pain, and patients with ulcers and oral lesions pain, and the mean age in the former group was lower. The mean age of patients with pain due to ulcers and



lesions was also significantly higher than in the other pain categories. With age, changes occur in all parts of the body (somatic and psychological) that cannot be avoided. Pathological trends resulting from aging are also a risk factor for many diseases. For example, psychological problems such as depression increase with age, which have been identified as a risk factor for chronic pain, including oral and maxillofacial pain [13,14]. The results of the present study also indicated that atypical facial pain was higher in men and BMS in women. To justify this, it can be said that certain types of temporomandibular joint disorders such as osteoarthritis and osteoporosis, as well as diseases such as burning mouth syndrome that can cause orofacial pain, are more common in women [15]. The results of the present study indicate that the mean pain intensity in patients was moderate to high on the VAS scale. Pain intensity is one of the predictors of seeking treatment [16,17]. Some studies show that the decision to go to medical centers for oral, maxillofacial, and facial pain is affected by two factors: pain intensity and fear of abnormal jaw movements [18]. The results of the present study showed that 37.5% of patients have a history of using diagnostic aids, of which the preparation of dental radiography was the most used. Many maxillofacial pains are of dental origin, and non-dental and referral pain is also often felt in the dental area. Therefore, paying attention to the characteristics of pain and using diagnostic methods can help differentiate pain. However, the use of unnecessary diagnostic tests has consequences, including increased costs for patients, insurance companies, and the government, in addition to the increase in wasted time and incorrect diagnostic results imposed on the patient [19]. The results of the present study showed that more than half of the patients did not receive treatment due to not receiving a definitive diagnosis and the highest frequency of treatment in maxillofacial pain in patients was medication. Other dental procedures performed on patients were tooth extraction, endodontic treatment and surgery, and combination therapies respectively, unfortunately, a significant percentage of these treatments were incorrect or unnecessary to address the patient's main complaint. In some cases, despite adequate treatment, patients consulted other physicians, that could be due to the patient's psychological problems and distrust of his physician. Improper and unnecessary treatments can not only exacerbate the patient's pain experience, but also induce the patient's anxiety, frustration, and distrust of the treatment system, and can impose significant costs on the patient and the government [20].

## CONCLUSIONS

According to the present study, in about half of the cases, patients delayed the professional consultation and also referred to different physicians several times to treat their problem. The most common diagnostic problems in oral and maxillofacial pain were related to atypical facial pain and burning mouth syndrome (BMS), respectively. Also, about

30% of the patients had received incorrect and unnecessary treatments, which were mainly drug treatments. The findings of the present study emphasize the importance of improving the knowledge and awareness of health care professionals about chronic orofacial pain conditions. This should improve the early recognition of patients with oral and maxillofacial pain, resulting in appropriate referral and management.

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