Prevalence of signs and symptoms of temporomandibular disorders in a young population at the beginning of treatment for drug dependence

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Abstract

Introduction:
Temporomandibular disorders (TMD) is a collective term that includes several clinical problems affecting the muscles of mastication, temporomandibular joints and other related structures. Consumption of licit and illicit drugs may be an etiological agent of TMD which should be considered when diagnosing a patient and developing a treatment plan.
Objective:
To estimate the prevalence of TMD signs and symptoms in a drug-dependent population at the beginning of their admission, and to analyze possible associated factors.
Materials and methods:
This was a descriptive cross-sectional study. Inclusion criteria: a) age range: from 15 to 35; b) beginning of treatment for problematic drug use; exclusion criteria: a) non-lucid patients: b) non-collaborative patients. We studied a sample of 135 subjects admitted to Portal Amarillo, Uruguay, under a residential system. The patients were examined by a calibrated researcher. The Uruguayan Survey Sheet for Prevalence of Bruxism and TMD was used. Informed consent was requested from each participant and/or their legal representative.
The prevalence of subjects with one or more current TMD signs was 29.7% (19.3% showing one sign, 8.9% two, and 1.5% three); those with one or more current TMD symptoms accounted for 68.8% (45.9% with one, 14.8% with two, and 8.1% with three) of the patients. The prevalence of current TMD symptoms showed a significant association with self-perceived stress (p=.03), mate consumption (p=.03) and alcohol consumption (p=.03).
Conclusions: The prevalence of current TMD symptoms in the population under treatment for drug dependence is high compared to the general population. This should be taken into account when developing prevention and therapeutic strategies.

Keywords: prevalence, temporomandibular disorders, drug dependence.

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Introduction

The American Academy of Orofacial Pain defines Temporomandibular Disorders (TMD) as a collective term that includes several clinical problems affecting the muscles of mastication, temporomandibular joints and other related structures[1]. TMD are a subgroup of musculoskeletal disorders suffered by the body, with a multifactorial etiology[2]. Occlusal, structural, psychological, traumatic factors, and general health conditions are risk factors which may be considered to predispose to, trigger, and perpetuate TMD[3]. The diagnosis and therapeutic issues which arise from TMD should not be limited to the dental-occlusal component, as it was suggested a few years ago[4]. Recent studies have shown that static and dynamic occlusal conditions may not be the most relevant aspect in TMD development[5].

Oral parafunctional habits such as bruxism, biting of the lips, cheeks, and objects, nail biting, thumb sucking, and gum chewing could be associated to signs and symptoms of TMD in children and teenagers[6]. A nationwide study conducted in Uruguay analyzed signs, symptoms, and potential factors linked to bruxism and TMD. It showed a high prevalence of TMD and bruxism in the populations under study, both in Montevideo and in the rest of the country: there was 55% of prevalence of at least one symptom of TMD, and 44% prevalence of at least one clinical sign[7]. In a similar study, the most frequent findings were limitation of mouth opening, asymmetrical mandibular movements, and TMJ noises[1]. A comparative study showed that pain on palpation of the muscles of mastication, the muscles adjacent to the neck, and the TMJ is more frequent in the case group (in treatment for TMD) than in the control group[8]. Other epidemiological reports have shown a high prevalence of recurrent tension headaches (episodic or chronic) in individuals suffering from TMD in relation to the control group without TMD, 95% versus 34%[9]. Surveys conducted among children and teenagers link TMD symptoms to orofacial and cervical pain[10]. Sleep is an important factor in the restoration of functions, and is also related to hormonal changes. Sleep disruptions such as bruxism, insomnia, and apnea could be indicators of the risk of TMD[11].

According to the World Health Organization (WHO) "a drug is any natural or manmade substance which, when taken into the body, alters one or more of its functions". Psychotropic or psychoactive drugs are those which act mainly on the central nervous system (SNC), altering mood, behaviors, consciousness, and perceptions[12]. These substances have been present in every culture in the history of humankind, and they are used for religious, cultural, recreational, and medicinal purposes. Any use of substances, whether licit or illicit, poses risks that vary depending on age, sex, forms and frequency of use, personal context and circumstances[13].

The term "abuse" refers to misuse or use for non-medical purposes, regardless of the consequences. Substance abuse generally refers to problems related to the use of psychoactive substances. The WHO has recommended replacing "abuse" with "dependence"[14].

Although initial and exploratory use may be voluntary, once the addiction has developed, this control disappears abruptly[15]. When under the influence, addicts undergo a series of changes that affect their physical, mental, and social state. When the dependent individual stops using one or more drugs, they experience the withdrawal syndrome, whose effects and duration vary depending on the substance used[16]. The withdrawal period during the drug-addiction treatment is particularly critical for dental health, mainly due to poor hygiene habits[17]. After a period of intense cocaine use, withdrawal is evidenced in a strong desire to use the drug, an extreme need to sleep, suicidal thoughts, and paranoia. The recovery process for individuals who use drugs usually involves

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psychiatric treatment for anxiety, restlessness, and hallucinations[18].

A study conducted in a care center for drug-dependent people in Israel, which compared an addicted group to a non-addicted paired sample, showed a high prevalence of TMD signs and symptoms, sleep bruxism and daytime teeth clenching in the addicted population under treatment, as compared to the control group[19].

In this study we used the working hypothesis that the population under treatment for drug dependency would register a higher prevalence of symptoms and clinical signs of TMD as compared to the general population. The intended aim was to estimate the prevalence of TMD signs and symptoms among teenagers and adults at the start of the treatment for drug abuse, as well as to analyze possible associations between different factors and current TMD signs/symptoms.

Materials and methods

The study included 135 patients (25 women, 108 men, and 2 transgender people, averaging 23 years of age) on a residential basis, being treated at Portal Amarillo (Uruguayan Information and Reference Center of the Drug Network, which provides treatment for young users of the State Healthcare Administration in the Republic of Uruguay)[20]. This was a descriptive cross-sectional study. The inclusion criteria used were: a) age range between 15 and 35, b) being at the inception stage of their treatment for problem drug use. The exclusion criteria were: a) nonlucid patients, b) noncooperative patients. The size calculation made based on the difference in proportions was 135 subjects. The study used the Uruguayan Survey Sheet for Prevalence of Bruxism and TMD[7]. The variables considered in the examination for current

TMD symptoms were: pain when opening the mouth, blockage of the jaw when opening the mouth, noise in the joints, and headaches. The clinical variables considered for signs of current TMD were: mouth opening less than 40 mm, pain on palpation of the muscles and pain on palpation of the TMJ.

Bias control

The operator was trained and calibrated (Kappa index 0.90 inter-operator and 0.95 intra-operator). Each participant was given a code to avoid using their names.

Ethical considerations

The thesis project for the MSc in Dental Sciences, with a focus on Craneal-Mandibular Function and Orofacial Pain was approved by the Research Ethics Committee of the School of Dentistry of Universidad de la República Oriental del Uruguay, file number 206/15. Each individual involved in the study or their legal representatives were requested to give their authorization to take part in the survey by signing an informed consent.

Statistical analysis

A descriptive analysis was conducted to detect the presence of current TMD signs and symptoms using statistical tables of absolute and relative frequency. The association between qualitative variables was analyzed by preparing contingency tables and applying the chi-square distribution test, with a 0.5 significance level. The potential association between response variables was assessed: current TMD signs and symptoms with explanatory variables such as head, neck or jaw trauma, self-perceived stress, regular consumption of mate, coffee, or tea, alcohol and cigarettes. Each binary variable was recorded as present or absent.

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Results

The sample showed characteristics that are typical of the drug-using population, as compared to another study published in 2009 which focused on the same care center[20]. The age range under study was 15 to 35 years of age (80% males, 18.5% females, 1.5% transgender), the individuals were likely to have a criminal record (50.4%), to be victims or perpetrators of gender, sexual, or domestic violence (25.9%), to engage in prostitution with the risk of contracting or transmitting STDs, to have teenage pregnancies, affecting the health of both mother and child, to live on the streets (19.3%) or with few belongings, to experience social exclusion, to have dropped out of formal education at an early age (93.3%), to be recently unemployed (76.3%), to have attempted suicide (22.2%), to be aggressive towards themselves and others, to cause traffic, domestic, and workplace accidents, to neglect their own health and their general dental-oral hygiene.

Poly-drug use was frequent in the population under study. They used predominantly legal drugs and some illegal ones, as well as psychiatric drugs without medical prescription, and other substances in a smaller proportion (see Table 1).

Table 1 - Description of consumption variables

	frequency	%		frequency	%
Alcohol			**Cocaine base paste**		
Yes	111	82.2%	Yes	23	17.0%
No	24	17.8%	No	112	83.0%
Tobacco			**Heroin**		
Yes	119	88.1%	Yes	1	0.7%
No	16	11.9%	No	134	99.3%
Marihuana			**Solvents**		
Yes	114	84.4%	Yes	30	22.2%
No	21	15.6%	No	105	77.8%
Cocaine			**Hallucinogenic mushrooms**		
Yes	100	74.1%	Yes	12	8.9%
No	35	25.9%	No	123	91.1%
Cocaine paste			**Floripon**		
Yes	109	80.7%	Yes	7	5.2%
No	26	19.3%	No	128	94.8%
Crack			**Psychiatric drugs**		
Yes	7	5.2%	Yes	37	27.4%
No	128	94.8%	No	98	72.6%

The prevalence of current signs of TMD and the presence of one or more signs are described in Table 2. The prevalence of current symptoms of TMD and the presence of one or more symptoms are described in Table 3.

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Table 2- Prevalence of current signs of TMD

Frequency		%
Mouth opening lower than 40 mm		
Yes	19	14.1%
No	116	85.9%
Pain on muscle palpation		
Yes	19	14.1%
No	116	85.9%
Pain on TMJ palpation		
Yes	18	13.3%
No	117	86.7
One or more signs		
None	95	70.4%
One	26	19.3%
Two	12	8.9%
three	2	1.5%

Table 3- Prevalence of current symptoms of TMD

Frequency		%
Difficulty to open mouth		
Yes	10	7.4%
No	125	92.6%
Jaw blockage		
Yes	9	6.7%
No	126	93.3%
Functional difficulties		
Yes	18	13.3%
No	117	86.7
Joint noises		
Yes	33	24.4%
No	102	75.6%
Headache		
Yes	65	48.1%
No	70	51.9%
One or more symptoms		
None	42	31.1%
One	62	45.9%
Two	20	14.8%
three	11	8.1%

Table 4 summarizes some of the associations studied. There was a significant association between TMD symptoms and self-perceived stress and the consumption of mate and alcohol ($p < 0.05$).

Table 4- Association between the prevalence of TMD symptoms and some factors

	TMD Symptoms		
	No	**Yes**	**p-value**
Trauma			
Yes	24.1%	75.9%	0.14
No	37.7%	62.3%	
Self-perceived stress			
Yes	43.8%	56.2%	0.03
No	24.1%	75.9%	
Consumption of mate			
Yes	22.2%	77.8%	0.03
No	8.9%	91.1%	
Consumption of coffee			
Yes	28.2%	71.8%	0.51
No	35.1%	64.9%	
Consumption of alcohol			
Yes	38.0%	62.0%	0.03
No	19.7%	80.3%	
Smoking cigarettes			
Yes	21.2%	78.8%	0.28
No	46.7%	53.3%	

Discussion

The American Academy of Pediatric Dentistry (AAPD) recognizes substance abuse in teenagers as a significant social, family, and public health issue in the United States[21]. Latin America has seen a higher prevalence of psychoactive substance abuse in recent years, with the corresponding increase in the number of medical consultations related to this behavior[22]. Substance abuse and dependence in Uruguay has seen qualitative and quantitative changes over the last decades, which have

positioned it as a serious public health issue. Problematic use of drugs, acts of violence, crime, the tendency to be involved in risky situations, suicide attempts, eating disorders, pathological gambling, internet addiction, etc., are symptoms of our contemporary society[20].

The pilot study conducted in Portal Amarillo in 2013[23], with the same Sheet as the "Uruguayan Survey for Prevalence of Bruxism and TMD"[7], found a 67.6% prevalence of current TMD symptoms in the population aged 15 to 35 in treatment for drug dependence (difficulty or pain when opening the mouth wide, blockage of the jaw when opening the mouth, functional difficulties, noise in the joints, headache); and a 42.3% prevalence of current signs of TMD (mouth opening less than 40 mm, pain on palpation of the muscles and pain on palpation of the TMJ)[23]. The survey conducted by the same team of researchers with the national sample of Uruguayan population in Montevideo and the rest of the country showed a 61.3% prevalence for current symptoms of TMD and 37.3% for current signs of TMD[7]. These preliminary results showed a higher prevalence of TMD signs and symptoms in dependent population. The results of this study, which used an enlarged sample, confirm this tendency for current symptoms of TMD.

These findings are in line with previous studies that show harmful overall health and oral health consequences for drug-addicted population[24]. Trauma is one of the main reasons why drug users are admitted to hospital emergency rooms[22]. Furthermore, cocaine users have been proven to have a higher incidence of bruxism as a secondary manifestation of the use of the drug[25] which causes pain in the TMJ and the muscles of mastication[26]. It has also been observed that illegal drug use has a negative impact both on hygiene habits and in the prevalence of decay, gingivitis, and periodontitis as compared to the general population[27,28].

Conclusions

At the beginning of the treatment for addiction to legal and illegal drugs on a residential basis at Portal Amarillo there is a higher prevalence of TMD symptoms as compared to the general population. Furthermore, individuals who perceive themselves as being under stress or consume mate or alcohol show a significant increase in the symptoms of TMD. These results suggest the need to incorporate measures to identify, prevent, and treat TMD in this vulnerable population.

Acknowledgments

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