

Drug Dependence, Bruxism and Temporomandibular Disorders

Comparative analysis of two populations: nationwide sample and Portal Amarillo's population in treatment for problematic drug use

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Abstract

Objectives. To estimate the prevalence of Bruxism and Temporomandibular Disorders (TMD) in two populations: a nationwide sample (Uruguay) and another sample formed by patients in treatment for problematic drug use in Portal Amarillo. **Method.** Two cross-sectional, descriptive and analytical studies: one nationwide and the other one in Portal Amarillo. **Results.** Portal Amarillo: TMD symptoms 67.6 %, bruxism symptoms 33.8 %, current TMD clinical signs 42.3 %, current or past bruxism signs 47.9 %. Nationwide sample: TMD symptoms 61.3 %, bruxism symptoms 27.7 %, current TMD signs 37.3 %, current or past bruxism signs 67.5 %. **Conclusions.** Trend that signals a higher prevalence of current TMD and bruxism in Portal Amarillo than in the nationwide sample. Current or past bruxism signs are more prevalent in the nationwide sample. New research should review the effects of the medication administered to treat the addiction before and during the treatment. Meanwhile we recommend the use of occlusal devices to minimize the side-effects on the structures of the masticatory system.

Keywords: Prevalence, Bruxism, Temporomandibular Disorders (TMD), Drug Dependence.

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Introduction

This study is the result of a collaborative endeavor of two research teams from the Facultad de Odontología of the Universidad de la República (UdelaR), Uruguay. The clinical area team of the Department of TDM Diagnosis and Treatment collected the data on the subject matter (Nationwide sample and Portal Amarillo). The basic area team of the Department of General and Oral Physiology, together with the Patient Admission and Registry Department, secured the funding through the 2012 call for funds of the National Drug Board. They also gathered information regarding additional oral cavity pathologies.

Human beings can become dependent on a wide range of objects and even subjects. Information on drug dependence is necessary not only for those who face problematic drug use or abuse but also for those who choose not to consume. The concepts of substance “use” and “abuse” are important, and so is the degree of dependence, since the constant pursuit of the substance of choice can modify the behavior of addicts (1).

Children and adolescents in Uruguay are not immune to drug consumption. Research studies conducted by the Uruguayan Observatory on Drugs on adolescents report alarming results regarding the abusive consumption of alcohol, tobacco and marijuana among secondary school students in Uruguay (2).

Highlights of the 2011 5th National Household Survey on Drug Use: persistence of high alcohol consumption, increase in the early onset of drinking, a decline in regular smoking for men, a significant increase in marijuana consumption, a significant increase in experimental cocaine consumption. The experimental consumption of cocaine paste remained stable for the general population (3). An early approach is essential to avoid, or end,

addiction. Dentists, as health care professionals, can help devise effective prevention strategies specially targeted at children and young people, who are often socially neglected. Different areas need to be considered in order to provide comprehensive care to drug addicted users: health, education, job training, recreational activities, sports and arts, among others (4).

Drug abuse causes changes in the behavior of users, such as mood swings, loss of self-esteem and neglect of their general and oral health (5).

The interdisciplinary team seeks to develop the self-confidence and self-esteem of those under treatment, maintain abstinence, prevent relapses and restore family, educational and work relationships (6).

Background

TMDs comprise numerous and diverse clinical conditions that may originate in the masticatory muscles, in the temporomandibular joint or in both (7).

Bruxism is a parafunctional activity that comprises tooth clenching and/or grinding, and which may occur during sleep and/or wakefulness (8, 9).

Both pathologies have a multifactorial etiology. Among these factors we find substance abuse: legal, drugs, illegal drugs and psychoactive drugs, which are considered triggering, perpetuating or predisposing factors (10-30). Recent studies conducted in Uruguay have shown a high prevalence of both pathologies in a population sample between the ages of 6 and 70 (31).

Portal Amarillo is the National Focal Point of the Drugs Network. It started working in 2006 and it combines three care methods: inpatient, day, and outpatient treatments. To access treatment in Portal Amarillo people

must be users of the State Health Services Administration (ASSE).

Based on the National Drug Board's platform, "Drug Problem: Everybody's Commitment", this subject matter entails a responsibility shared by the state and society. UdelaR is a public institution which has reciprocal relationships with society. Facultad de Odontología, through the collaborative work of faculty members together with doctors, other experts and workers of Portal Amarillo, has tried to identify problems and provide solutions for a comprehensive approach of the population under study.

Portal Amarillo has a population of mainly adolescent and young adult users, generally of an underprivileged socioeconomic status. At the moment of the first consultation, few of the individuals work or study. In addition, we must consider other factors such as deteriorating family relationships, the physical, mental, spiritual and social transformations adolescents go through, and auto/hetero aggressive behaviors.

The target population often has a history of criminal behavior, domestic and sexual violence against women, gender violence, commercial sexual exploitation of children and adolescents, prostitution, high-risk teenage pregnancy, homelessness, lack of assets and social exclusion. In terms of the types of substances, polydrug use seems to be the norm, which increases the severity of risks and makes diagnosis more difficult.

Objectives

To estimate and compare the prevalence of bruxism and TDM in two populations: one of individuals under treatment for problematic drug use in Portal Amarillo, and the second, a nationwide sample of individuals of a similar age range.

Materials and methods

Cross-sectional, descriptive and analytical studies were conducted for a population of both sexes. For both populations, the individuals, or their legal representatives, were requested to sign an informed consent. Portal Amarillo's sample comprised 71 individuals between the ages of 15 and 35. The nationwide sample comprised 672 individuals between the ages of 18 and 39. The form was the same used in the national bruxism and TDM prevalence survey conducted by Riva et coll. (31).

Examiners were calibrated with Kappa coefficient 1.0. The protocol used to evaluate signs, symptoms and risk factors for bruxism and TDM was validated and reported in a previous study (31).

Both projects were endorsed by the Ethics Committee and the Board of the Facultad de Odontología, UdelaR.

Clinical symptoms and signs were surveyed so as to determine the presence of current TDM, symptoms of current bruxism, and clinical signs of current or past bruxism.

The variables surveyed for current TDM symptoms were: difficulty or pain when opening the mouth wide, locking of the jaw while opening mouth, functional difficulties, jaw-joint noise, and headache.

The clinical variables surveyed for current TDM signs were: mouth opening of less than 40 mm, muscle tenderness, temporomandibular joint (TMJ) tenderness.

For current bruxism: reporting waking up feeling like they have clenched their teeth during sleep and family members have mentioned they make grinding noises with their teeth during sleep.

For current or past bruxism: evidence of tooth wear facets due to parafunction.

Statistical analysis

Age distribution in the nationwide sample is completely different to the distribution of the general population (the 2004 pre-census report of the National Institute for Statistics was used to compare the information). Therefore, post-stratification was used to find the correct sampling weights to allow for expansion and calculation of standard errors (SE). This ensures that the measurements in our sample correspond to those of the reference population in terms of their characteristics.

Since two samples were used, one from Montevideo and the other one from the rest of the country (considered as only one stratum or population), the sample designs were: a design stratified into four socioeconomic levels for Montevideo and a design stratified into Departments. For a more detailed description of the sample recalibration process, please see the corresponding document (31). An R statistical package was used for statistical processing (32). It should be noted that confidence intervals (CI) were calculated by normal approximation at a 5% level and the standard deviation resulting from the post-stratified estimators.

Simple percentage calculation was conducted for the Portal Amarillo population. It was not possible to express statistical significance as there was no national reference available on the prevalence of bruxism and TDM in people with problematic drug use.

Results

Data obtained for Portal Amarillo: TMD symptoms 67.6%, bruxism symptoms 33.8%, current TMD clinical signs 42.3%, current or past bruxism signs 47.9%. In contrast, the nationwide sample results were: TMD symptoms 61.3%, current bruxism symptoms 27.7%, current TMD clinical signs 37.3%,

current or past bruxism clinical signs 67.5% (Table 1 and Figure 1).

	Portal Amarillo	Nationwide sample (CI 95%)
TMD symptoms	67,6 %	61,3 % (57% - 65,6%)
TTM Clinical signs	42,3 %	37,3 % (33,4% - 41,1%)
Bruxism symptoms	33,8 %	27,7 % (23,9% - 31,5%)
Bruxism clinical signs (current or past)	47,9 %	67,5 % (63,4% - 71,5%)

Table 1: Prevalence percentages for both populations

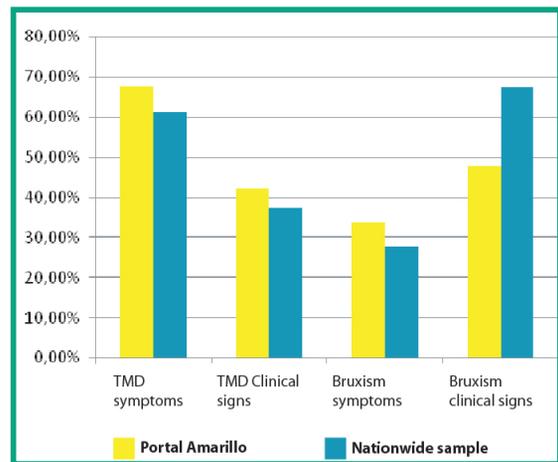


Figure 1: Prevalence percentages for both populations

Discussion

A comparative analysis of the results obtained shows that Portal Amarillo population has a propensity to higher prevalence of current TDM signs and symptoms and current bruxism signs, but a lower prevalence of clinical signs of parafunctional wear facets was found. These evidence current or past bruxism, since their mere presence is not

enough to state that it is active (8, 33).

Even though the clinical aspects of active pathologies have higher prevalence values in Portal Amarillo than in the nationwide sample, as expected, the results obtained from the assessment of tooth wear facets are not only not higher, but actually lower.

This has led us to ponder the following questions:

a) The presence of new factors in Portal Amarillo population (pharmacological treatment to address drug dependence) may be fostering the development or intensification of existing pathologies. All the individuals under treatment surveyed in Portal Amarillo were chronic consumers of addictive substances, so if these were a significant cause for the development of bruxism, the tooth wear prevalence percentage should actually be higher than that of the nationwide sample. We must also bear in mind that this population presents a polydrug use behavior, among these: cocaine paste (94.3%), marijuana (76.1%), alcohol (76.1%) (Tables 2 and 3) and lower or nil percentages of heavier drugs such as cocaine or ecstasy, which, according to several results, are associated with severe bruxism (13, 34, 35, 36), since this is a low-income population without access to this sort of substance. Further research should be conducted to study the impact of this type of consumption on the onset of bruxism.

Cocaine paste	94,30%
Cocaine hydrochloride	47,90%
Alcohol	76,10%
Marijuana	76,10%
Crack	1,40%
LSD Hallucinogenics	8,50%
Benzodiazepines	8,50%
Solvents, inhalants	9,80%
Nicotine	92,20%

Table 2 Substance used by our 2012-2013 sample population

Cocaine paste	94%
Cocaine hydrochloride	4%
Alcohol	1%
Marijuana	1%

Table 3 Substances that led the first users of Portal Amarillo to seek consultation (37)

b) Considering that: compared to the nationwide sample, Portal Amarillo shows a propensity to higher values of signs and symptoms that show evidence of active pathologies, such as: muscle and/or joint tenderness and limited range of jaw movements in terms of TDM; waking up feeling like they have slept clenching their teeth and/or report making noises with their teeth during sleep, in terms of bruxism; considering that drug abuse treatment includes the administration of psychoactive substances in the medication, we could infer that such propensity would be more likely related to the medication than to the dependence itself. The drugs administered during the abstinence period can cause or worsen bruxism and parafunction (8, 10, 34, 35). Since the study of the pathological history (parafunctional wear facets) shows lower percentages in the Portal Amarillo population, further research is recommended to evaluate the patient before, during and after undergoing drug abuse treatment. In addition, research should survey middle and high-income populations that have access to more expensive substances, and compare the type of drug used and the prevalence of the pathologies under study.

Conclusions

This comparative study of two populations, one under treatment for problematic drug use in Portal Amarillo and the other, a nationwide sample of a similar age range shows:

1- The population of Portal Amarillo presents:

- 1.1- Propensity to higher prevalence levels of:
 - current TDM clinical symptoms,
 - current TDM clinical signs, and
 - current bruxism clinical signs.

- 1.2- Lower prevalence of the clinical sign of parafunctional wear (current or past bruxism)

2- Further research should be conducted targeting individuals from different socioeconomic levels seeking problematic drug use treatment, in order to analyze:

- 2.1- Consumption modality, most consumed substances and their influence on bruxism and TDM.

- 2.2- Prevalence of bruxism and TDM before treatment.

- 2.3- Effects of the psychoactive medication administered during treatment.

3- In the meantime we recommend the use of Orthopedic Stabilization Devices for patients undergoing problematic drug use treatment with psychoactive drugs, so as to minimize their negative or side effects on the stomatognathic structures, especially tooth wear and pain.

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