Nocturnal Bruxism: Still a Nosological Conundrum?

Corresponding Author:
Dr. Eva Gjovreku,
Dentistry specialist, Crystal University, Tirana, Albania - Albania

Submitting Author:
Dr. Gentian Vyshka,
Lecturer, Biomedical and Experimental Department, Faculty of Medicine, University of Tirana, Rr Dibres 371 - Albania

Article ID: WMC004234
Article Type: Original Articles
Submitted on: 07-May-2013, 05:27:31 PM GMT Published on: 08-May-2013, 10:34:35 AM GMT
Article URL: http://www.webmedcentral.com/article_view/4234
Subject Categories: DENTISTRY
Keywords: Sleep bruxism, A typical facial pain, Surface electromyography, Dystonia, Dental malocclusion

How to cite the article: Gjovreku E, Vyshka G. Nocturnal Bruxism: Still a Nosological Conundrum? . WebmedCentral DENTISTRY 2013;4(5):WMC004234

Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC-BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Source(s) of Funding:
No funding received.

Competing Interests:
No competing interests to declare.
Nocturnal Bruxism: Still a Nosological Conundrum?

Author(s): Gjovreku E, Vyshka G

Abstract

Sleep bruxism is a frequent and bothersome, albeit benign condition. Diagnosed initially from dentistry specialists, it has become gradually a neurological enigma, since several neurotransmitters and situations not related to dental malocclusion might cause teeth grinding and atypical facial pain. We have studied three cases with surface EMG, performed in the morning hours, thus registering electrical activity bilaterally and simultaneously in ipsilateral masseters and temporal muscles. A clear dissociation in electrical activity at rest was seen, with higher values of spontaneous discharges in the masseter muscles (up to 35%), confronting with a normal activity in the temporal muscles. Such a finding favours the dystonic hypothesis of bruxism, and will therefore justify usage of ad hoc drugs, such as botulinum toxin, among others.

Introduction

Bruxism is a stereotypical disorder of movement, characterized from teeth grinding or clenching during sleep. The disorder was initially described from Marie Pietkiewicz, but she originally used the term bruxomanie [1]. Such a term was later changed into bruxism, and entered in the clinical usage. The disorder seems fairly frequent, with prevalence values oscillating between 8 to 31%, according to different sources [2].

As long as bruxism might be present during sleep or during daytime, authors have coined the term sleep (nocturnal) bruxism, and prevalence studies generally refer only to the latter [3]. Teeth grinding is an epiphenomenon of internal tension in a very large number of adults, although very few refer it and request medical assistance. Due to the generally benign character of the disorder, dentistry specialists are the first to diagnose it, since bruxism might cause teeth damage, temporo-mandibular dysfunction and atypical facial pain [4-6].

Methods

According to the specialist literature, sleep bruxism and teeth grinding are considered as concomitant to:
1. Peripheral factors such as dental malocclusion;
2. Psychosocial influences, namely stress and anxiety levels;
3. Central causes, related to neurotransmitter systems in the telencephalon or in the basal ganglia.

Of course, minor anatomical anomalies such as malocclusion will predispose for the disorder, but the fact is that sleep bruxism episodes might persist even after correction of dental causative factors. This is true to that extent, that considering bruxism principally a movement disorder, authors have tried and applied botulinum toxin to relieve clinical signs [7].

Genetic traits have been traced and formulated in sleep bruxism as well, but the models are not uniform [8, 9].

Authors have been raising the hypothesis of a dopaminergic dysfunction in the genesis of sleep bruxism, and the first case was reported from Magee in 1970, in a patient suffering from the disease of Parkinson, showing consistent teeth grinding under L-Dopa therapy [10]. Other sources have reached a completely different conclusion, suggesting even a therapeutic value of Dopa-therapy specifically in bruxism [11]. Other catecholamines such as adrenaline have been under scrutiny, with suggestions that beta-blockers might be helpful. Conversely, serotonin was imputed in aggravating the disorder, and selective serotonin reuptake inhibitors (SSRI), a new class of antidepressants drugs, show among other side effects the teeth grinding and bruxism episodes, among other [12].

Results

Surface electromyography was performed to three persons, whose spouses were complaining continuous nocturnal rumours related to teeth grinding: only two of the patients referred facial pain, and the third one being completely free from symptoms. All three cases were recently seen from dentistry specialists and malocclusion was excluded as a probable causative factor.

Surface EMG was performed in the morning, at a maximum of three hours after arousal, and findings
were repeated in four consecutive sessions in following days. Muscular activity was registered at the masseters and temporal muscles of the same side for two minutes, and thereafter on the other side, with the patient being at rest, in supine position, in a quiet environment.

A summary of electromyographic findings and one of the traces registered are shown respectively at the Table no. 1 and Figure no. 1 (see below).

**Figure 1:** Trace above, masseter activity at rest. Trace below, temporal muscle of the same side. Note the obvious difference in amplitude and the frequency’ discharges (same amplification).

Spontaneous activity was registered in terms of fibrillations and complex electrical discharges, with patient at rest (no chewing or swallowing in course).

**Discussion**

Bruxism is considered etiologically different under two aspects: as a local disorder; and as a neurological problem [13]. Our data suggest that a clear dissociation in the electrical activity was seen between electromyographic traces in the masseter, when comparing with the ipsilateral temporal muscle. Such data are compatible to some extent with other findings; and registration over both muscular territories is an indispensable condition for obtaining reliable data [14, 15].

A limitation of the present study was the fact that registration was performed during day hours; a thorough polysomnographic study with night hour’s registration would of course be more helpful towards a better understanding of the entire pathological process that characterizes bruxism, diurnal or nocturnal in its nature.

**References**

Illustrations

Illustration 1

Table

Presence of spontaneous activity and respective percentage in the muscular territories controlled through surface electromyography

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (years)</th>
<th>Sex</th>
<th>Right masseter spontaneous activity</th>
<th>Right temporal muscle</th>
<th>Left masseter spontaneous activity</th>
<th>Left temporal muscle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37</td>
<td>Male</td>
<td>Spontaneous activity (&gt;30%)</td>
<td>No spontaneous activity</td>
<td>Spontaneous activity (30%)</td>
<td>Spontaneous activity with norm (15%)</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>Male</td>
<td>No spontaneous activity</td>
<td>No spontaneous activity</td>
<td>Spontaneous activity (30%)</td>
<td>No spontaneous activity</td>
</tr>
<tr>
<td>3</td>
<td>38</td>
<td>Female</td>
<td>Spontaneous activity (40%)</td>
<td>Spontaneous activity within norm (10%)</td>
<td>Spontaneous activity (30%)</td>
<td>No spontaneous activity</td>
</tr>
</tbody>
</table>
Illustration 2

Surface electromyography of masseter and temporalis (ipsilateral)
Disclaimer

This article has been downloaded from WebmedCentral. With our unique author driven post publication peer review, contents posted on this web portal do not undergo any prepulation peer or editorial review. It is completely the responsibility of the authors to ensure not only scientific and ethical standards of the manuscript but also its grammatical accuracy. Authors must ensure that they obtain all the necessary permissions before submitting any information that requires obtaining a consent or approval from a third party. Authors should also ensure not to submit any information which they do not have the copyright of or of which they have transferred the copyrights to a third party.

Contents on WebmedCentral are purely for biomedical researchers and scientists. They are not meant to cater to the needs of an individual patient. The web portal or any content(s) therein is neither designed to support, nor replace, the relationship that exists between a patient/site visitor and his/her physician. Your use of the WebmedCentral site and its contents is entirely at your own risk. We do not take any responsibility for any harm that you may suffer or inflict on a third person by following the contents of this website.