

Acupuncture as therapeutic resource in patient with bruxism

Acupuntura como recurso terapêutico no paciente com bruxismo

La acupuntura como modalidad terapéutica en paciente con bruxismo

Maria Cristina Rosifini **ALVES REZENDE**¹
Crischina Branco Marques **SANT'ANNA**²
André Pinheiro de Magalhães **Bertoz**¹
Sandra Maria Herondina Coelho Ávila de **AGUIAR**¹
Luis Guilherme Rosifini **ALVES REZENDE**³
Ingrid Silva **MONTANHER**³
Ana Laura Rosifini **ALVES REZENDE**⁴
Vitor Artur Miyahara **KONDO**⁵
Igor Youssef Sabbagh **GUIMARÃES**⁵

¹Universidade Estadual Paulista "Júlio de Mesquita Filho", UNESP - Faculdade de Odontologia de Araçatuba

²Voluntária - Universidade Estadual Paulista "Júlio de Mesquita Filho", UNESP - Faculdade de Odontologia de Araçatuba

³Graduação - Universidade de Ribeirão Preto - Faculdade de Medicina

⁴Graduação - PUCAMP - Faculdade de Medicina

⁵Graduação - Universidade Estadual Paulista "Júlio de Mesquita Filho", UNESP - Faculdade de Odontologia de Araçatuba

Abstract

Bruxism is the harmful habit of clenching or grinding the teeth during the day and / or night, with unconscious pattern, with particular intensity and frequency, outside the functional movements of chewing and swallowing. It is accepted that bruxism is a response controlled by the neurotransmitters dopamine system associated with emotional component. The proposed of treatment of bruxism with acupuncture aims to stimulate sensory fibers of the peripheral nervous system leading to electrical transmission by neurons sufficient to produce changes in the central nervous system. As a consequence there is the release of substances (cortisol, endorphins, dopamine, noradrenaline and serotonin) that promote wellness and restoration of harmony, be it psychological, biological and / or behavioral.

Descriptors: Acupuncture Therapy; Acupuncture Points; Temporomandibular Joint Disorders .

Resumo

O bruxismo é o hábito nocivo de apertar ou ranger os dentes durante o dia e / ou noite, com intensidade e frequência, inconscientemente, fora dos movimentos funcionais da mastigação e deglutição. Aceita-se que o bruxismo seja uma resposta controlada por neurotransmissores do sistema dopaminérgico associada a componente emocional. A proposta de tratamento do bruxismo com acupuntura visa estimular as fibras sensitivas do Sistema Nervoso Periférico levando a transmissão elétrica pelos neurônios suficientes para produzir alterações no Sistema Nervoso Central. Como consequência ocorre a liberação de substâncias (cortisol, endorfinas, dopamina, noradrenalina e serotonina) que promovem bem-estar e restabelecimento da harmonia, seja ela psicológica, biológica e/ou comportamental.

Descritores: Terapia por Acupuntura; Pontos de Acupuntura; Transtornos da Articulação Temporomandibular

Resumen

El bruxismo es el hábito lesivo de apretamiento o frotamiento de los dientes, durante el día y/o la noche con intensidad y persistencia, en forma inconsciente, fuera de los movimientos funcionales de masticación y deglución. Se acepta que el bruxismo es una respuesta controlada por neurotransmissores del sistema dopamina asociada con el componente emocional. El tratamiento propuesto de bruxismo con acupuntura tiene por objeto estimular las fibras sensoriales del sistema nervioso periférico que conduce a la transmisión eléctrica de las neuronas suficientes para producir cambios en el sistema nervioso central. Como consecuencia existe la liberación de sustancias (cortisol, endorfinas, dopamina, noradrenalina y serotonina) que promueven el bienestar y la restauración de la armonía, ya sea psicológico, biológico y / o de comportamiento.

Descriptores: Terapia por Acupuntura; Pontos de Acupuntura; Trastornos de la Articulación Temporomandibular.

INTRODUCTION

The parafunction can be defined as any non-functional neuromuscular activities of the system stomatognathic, because of the repetition of a act generally pleasant for the individual. It causes hyperactivity of craniomandibular muscle groups and increase the internal pressure of the temporomandibular joint. when parafunction exceeds the tolerance level of the individual can bring occlusal compromises, muscle and / or joint¹⁻⁵

Tomé et al.⁶ studied the influence of oral habits, either directly or indirectly, in determining the deviation in tooth morphology. Concluded to be related with abnormal bone growth, poor tooth position, breathing problems and phonation, oral motor skills and changes in psychological disorders.

Okeson⁷ believes that the activities of masticatory system may be functional or parafunctional. Functional activities are chewing, swallowing and speech, which permits the stomatognathic system perform the necessary functions with a minimal damage to structures.

Among the parafunctional activities are bruxism, clenching, nail biting and other bad oral habits. The parafunctional activities can occur during the day or at night (during sleep).The daytime activities include clenching, biting lip, cheek or other objects, thumb sucking, poor posture, as well as other habits which the individual performs, in most often unconsciously. The activity more frequent during sleep is clenching, known as bruxism⁸⁻¹³.

The bad oral habits cause isometric muscle contraction, inhibition of normal blood flow to muscle tissue, increase of carbon dioxide and metabolic waste in the muscle tissues, culminating with fatigue, muscle spasms and pain. For this reason there is a greater likelihood of parafunctional activities cause changes in muscular system and the temporomandibular joint, since the structures of the masticatory system tolerates a certain amount of power generated by hyperactivity, which are outdated lead to a collapse in the tissues¹³.

Bianchini¹⁴ believes that the parafunctional

habits may affect the stability of the stomatognathic system. Dawson¹⁵, Durso¹⁶ said that these activities take place without the person knows what they are doing. However, Bianchini¹⁴ reports that the majority of patients it had awareness of the achievement of deleterious habits, although they did not know the harm they caused.

Moreover, it is believed that the parafunctions can interfere in craniofacial development leading to malocclusion, cross or open bites. This makes it very important to intercept and prevent these habits and their consequences, considering that some changes present the character of irreversibility. If the habits occur during facial growth can lead to abnormal and persistent muscle forces and relevant changes in the structures of the stomatognathic system.

BRUXISM

Bruxism is a parafunction with tooth clenching, grinding and rhythmic oro-mandibular movements (artigo between). Bruxism is an involuntary activity of the jaw musculature that is characterized, in awake individuals, by jaw clenching (so-called awake bruxism) and, on rare occasions, by tooth gnashing and/or grinding¹⁷. Sleep bruxism (SB) is an oral activity associated with jaw movements and tooth grinding.

During SB, both clenching and tooth-grinding are observed^{17,18}. Particularly, the sleep bruxism is a frequent phenomenon that causes cephalgia and muscular/joint pains to the awakening, besides an increased dental abrasion and sensibility. Lavigne¹⁷ remember that the neurobiology of sleep bruxism (SB) is poorly understood and uncertain in terms of etiology and pathophysiology: while the occlusal discrepancies and the anatomy of the bony structures of the orofacial region play only a minor role, others factors, like smoking, alcohol, drugs, systemic diseases, stress, trauma and heredity, appear to have an important role in the sleep bruxism genesis^{18,19}. Special attention should be given to the role of the cardiac/autonomic system, as well as to brain cortical electroencephalographic (EEG) activation and the neurochemical processes associated with motor excitability and neurogenic excitability in relation to sleep. The role of peripheral sensory inputs (e.g., periodontal) and of cognitive-behavioral factors (e.g., stress, anxiety, personality) in sleep bruxism (SB) has been cited in the literature^{18,20-22}

Sleep bruxism is believed to be highly variable over time, with subjects showing no activity on some nights and intense activity on others. Interestingly, during sleep, the jaw is usually open due to motor suppression, tooth contact most likely occurs in association with sleep arousal. This suggests that the central and/or autonomic nervous

systems, rather than peripheral sensory factors, have a dominant role in SB genesis. However, some peripheral sensory factors may exert an influence on SB through their interaction with sleep-wake mechanisms. The consequences of SB may include tooth destruction, jaw pain, temporomandibular dysfunction (e.g., jaw pain or movement limitation), headaches, or the limitation of mandibular movement, as well as tooth grinding sounds that disrupt the sleep of bed partners²³⁻²⁷. The bruxism is termed "secondary" when it occurs following the use of medication or in the presence of a neurological or psychiatric disorder (e.g., Parkinsonism, depression, schizophrenia), or, it is termed 'secondary'^{25,28}.

In the general population the prevalence of awake bruxism in the is approximately 20%, while the prevalence of SB is about 8%^{25,29-32}. Complaints of tooth-grinding occurring during sleep decline over time, from 14% in children to 8% in adults to 3% in patients over 60 years of age^{25,31,33}. Sometimes, awake bruxism can occur alone or concomitantly with sleep bruxism (SB). Some patients complain of jaw tightness and grinding sounds daily or nightly, whereas others report these infrequently^{25,34,35}. Lavigne et al.¹² observed that in cases of severe and frequent sleep bruxism (SB), the variation of the number of oro-motor episodes *per* hour of sleep is 25%, and the variation of tooth-grinding frequency is higher, at 53.5%³⁶.

For the diagnosis of the sleep bruxism (SB) the awareness or reports of current tooth-grinding are more reliable that appearance of tooth wear and the patient's reports of jaw muscle tightness, discomfort and pain^{25,35,37}.

Over the hand, sleep bruxism (SB) and tooth-grinding are frequently monitored with polygraphic and audiovisual recording systems in a laboratory milieu for research purposes (*i.e.*, polysomnography)^{25,29,38}. An alternative is the use of a portable system at home, in the natural sleep environment^{25,39-41}. Its important remember that although this is less expensive than the laboratory recordings, full polysomnography allows for the recognition of most SB motor activity that can otherwise be confounded by ongoing jaw activity, such as swallowing, coughing, sleep-talking, sighing, or myoclonus^{25,35,42-43}. The sleep bruxism (SB) is associated with jaw muscle activity defined as one of three types: rhythmic jaw muscle activity, termed 'phasic' (three or more bursts of muscle contractions at a frequency of 1 Hz); sustained activity, termed 'tonic' (a contraction lasting more than 2 sec); or a mixture of both types^{25,38,44}. Over 88% of episodes of sleep bruxism, based on electromyographic (EMG) recordings, are of either the phasic or mixed type. In sleep bruxism (SB), jaw muscle activity mainly occurs during light sleep (60-80%) at a mean frequency of 5.4 to 5.8 episodes *per* hour of

sleep^{25,38,45,46}. Close to 60% of normal subjects also show rhythmic masticatory muscle activity (RMMA), during the sleep at frequency of 1.8 episodes *per* hour of sleep^{25,47,48-50}. In the other hand, the frequency of RMMA is three times lower in normal subjects than in sleep bruxism (SB) patients, the muscle contractions are of a lower amplitude, and no tooth-grinding sound complaint is reported⁵⁰.

TREATMENT OF BRUXISM WITH ACUPUNCTURE

Management of bruxism includes occlusal therapy (occlusal interventions and occlusal appliances), biofeedback exercises and pharmacological approach⁵¹.

The important point is to determine what factors, specifically, are involved in each patient, that for choosing an appropriate treatment, among the various therapeutic modalities exist, or an association of two or more treatments⁵²⁻⁵⁴. The use of acupuncture/Chinese medicine treatments aims stimulate the release of opioids by the body itself, controlling the pain sensation of the individual⁵⁵. For Maciocia⁵⁶, the diagnoses in Traditional Chinese Medicine are based on patterns of disharmon. The theory of Yin and Yang is widely used in Traditional Chinese Medicine explaining the histological structure, physiological function and pathological changes of organism. It also serves as a guide for diagnosis and treatment⁵⁷. The nature of Yin or Yang is not absolute, but relative, and their existence is determined by indoor conditions. According Yamamura⁵⁸, each comprising two parts contradictory aspect transforming each other under certain circumstances: within Yin and Yang live their opposite portions. Yin contains the seed of Yang and Yang contains the seed of Yin⁵⁶; Hopwood⁵⁹ e Sussmann⁶⁰.

Also the energy channels provide an essential foundation for understanding the various pathological, physiological, diagnostic and therapeutic aspects of Traditional Chinese Medicine. According to the traditional theory, exist in a system for body energy channels or vessels which integrate all parts of the body, forming a unified body. Energy channels have important roles in physiological and pathological function of the connections between the tissues and organs⁵⁸.

In specific energy points located on meridians or channels of energy flow, lie approximately 750 acupuncture points. With different electrical resistance than the surrounding tissue, when stimulated through needles, infrared, laser or electric current, send signals to the central nervous system, causing it to block the passage of pain, promoting the balance between Yin (negative) and Yang (positive)⁵⁵.

So, the mechanism of action of acupuncture is based on the fact that the introduction of the needle

into specific points on the energy meridians generates stimulus in the nerve endings of muscles, which is sent to the central nervous system, where it is recognized and translated into three levels:^{53, 61}.

- hypothalamic level - the activation of the hypothalamic-pituitary leads to the release of endorphins (pain killers), cortisol (anti-inflammatory) and serotonin (antidepressant) in the bloodstream and cerebrospinal fluid;
- level of the midbrain, with activation of neurons in the grey matter, releasing endorphins which will stimulate the production of serotonin and norepinephrine;
- level of the spinal cord, with activation of interneurons in the gelatinous substance and the release of dynorphins.

In dentistry, the application of acupuncture is used in pre-treatment of patients anxious, stressed and even for hypertensive patients or patients with systemic diseases, improving the quality of care. Acupuncture for obtaining analgesia has been used in the procedures of Dentistry, Endodontics, Periodontics and Surgery, because this therapy is less traumatic than conventional anesthesia, besides decreasing the consumption of anesthetic drugs. In the treatment of temporomandibular disorders, bruxism and other myofascial symptomatology the use of acupuncture as an important adjunct^{53,55,61}.

Dallanora et al.⁵⁵ shows reduction of activity of the masseter and temporal muscles up to five days after application of acupuncture. Acupuncture is also well regarded as an alternative therapy for treatment of patients with chronic disorders in refractory to conventional therapy, as with needling certain points occurs the release of endogenous substances such as endorphins and other substances that have analgesic, anti-inflammatory and relaxing⁶².

Acupuncture aims to treat not only the bruxism, but acts on the entire nervous system, stimulating the compensation mechanism and balance throughout the body. Acupuncture points are considered in TCM (Traditional Chinese Medicine) the outer area of the energy body individual's functioning as communication link between internal and external. Some concepts about mechanisms of action of acupuncture are important to understand how it can act in cases of bruxism. The action of acupuncture opposite bruxism appears to be strongly associated with treatment of the condition of the patient, since many of the points used are related to the treatment of stress and anxiety and sleep disorders, for example, points E36, BP6, F3, ID19, VB34, EX-HN4, EXHN2⁶³. The stimulation of certain points can change the dynamics of blood circulation and also promote muscle relaxation, remedying spasm and decreasing inflammation and pain (Figures1-3). Furthermore, stimulation some points can promote release of hormones such as

cortisol and endorphins, promoting analgesia. The association between bruxism and neurotransmitters of catecholamin was demonstrated by several researches and the reduction of these levels after acupuncture session, justifies its use in this type of treatment⁵⁵.



Figure 1: Acupuncture points used for TMD treatment.



Figure 2: Acupuncture points used for TMD treatment.



Figure 3: Acupuncture points used for TMD treatment.

For acupuncture filosofia the illness results the interaction between staff and offenders the body's response, led by central nervous system. Furthermore, Internal or external causes can disrupt the normal function of the body and affect the energy points and channels, making them more sensitive or painful to the touch. Even if a disease originates in an internal organ, the signs and symptoms can manifest themselves in distant areas, related to that energy channel associated with the organ. For Ross⁶⁴ if the body is weakened, in depressive state, suffering from anxiety, this will be reflected negatively at nervous system central⁶⁵.

The energy channels of the stomach, small intestine, gall bladder and triple burner show up in the affected temporomandibular disorders. E6 and E7 are traditional points for local treatment of disorders of the head and neck. The localized muscle pain or myofascial pain that originates in parafunctional habits can be treated with activation points of E6, E7 and E44 under dispersion⁶⁴. Bruxism also seems to respond to the points E6, E7, IG4 and TA17⁵⁸. The combination of points VB1, VB2, VB43, ID2, ID17, ID18 and IG4 also shows positive results in reducing headache and facial pain.

CONCLUSION

The multifactorial etiology of bruxism leads to the variety of treatment options. Accepted that the cause of bruxism is emotional or occlusal or both associated. Thus, the psychological treatment accompanied by occlusal correction is generally prescribed. The application of acupuncture in patients with bruxism part of principle that it is capable of reducing the activity of the masticatory muscles and control stress and anxiety. The advantage of acupuncture treatment of Bruxism is the absence of adverse side effects and the possibility of being associated with conventional treatment.

REFERENCES

1. Alves-Rezende MCR, Silveira BASV, Bertoz APM, Dekon SFC, Verri ACG, Alves-Rezende LGR, et al. Parafunctional activities in brazilian children and adolescent. Rev Odontol Araçatuba. 2011; 32: 62-6.
2. Alves-Rezende MCR, Soares BMS, Silva JS, Goiato MC, Turcio KHL, Zuim PRJ, et al. Frequência de hábitos parafuncionais: estudo transversal em acadêmicos de Odontologia. Rev Odontol Araçatuba. 2009; 30: 59-62.
3. Alves-Rezende MCR, Silva JS, Soares BMS, Bertoz FA, Oliveira DTN, Alves-Claro APR. Estudo da prevalência de sintomatologia temporomandibular em universitários brasileiros de Odontologia. Rev Odontol Araçatuba. 2009; 30: 9-14.
4. Cortiglio S, Alves-Rezende MCR, Alves-Rezende LGR, Montanher IS, Alves-Rezende ALR. Estudo da associação entre bruxismo, consumo de álcool e tabaco em universitários brasileiros. Arch Health Invest. 2012; 1 (Spec):36
5. Alves-Rezende MCR, Bertoz APM, Aguiar SMHCA, Alves-Rezende LGR, Alves-Rezende ALR, Montanher IS, et al. Abordagem terapêutica nas desordens temporomandibulares: técnicas de fisioterapia associadas ao tratamento odontológico. Arch Health Invest. 2012; 1: 18-23
6. Tomé MC, Farret MMB, Jurach EM. Hábitos orais e maloclusão. In: Marchesan, I. Tópicos em

- fonoaudiologia. São Paulo: Lovise; 1996. p.97-109.
7. Okeson JP. Tratamento das desordens temporomandibulares e oclusão. 4. ed. São Paulo: Artes Médicas; 2000.
 8. Cerqueira JAO, Borel KC, Coelho KCC, Barbosa FS, Silva VCC. Prevalência de hábitos parafuncionais em universitários. Rev Cient FAMINAS. 2007; 1:223.
 9. Friedman J. Mascar chicletes pode causar danos à mandíbula. Jornal do Comércio, Recife, 13 de julho de 1997. Disponível em: <http://www2.uol.com.br/JC/1507/fa1307d.htm>. Acesso em: 22 out 2012.
 10. Gavish A, Halachmi M, Winocur E, Gazit E. Oral habits and their association with signs and symptoms of temporomandibular disorders in adolescent girls. J Oral Rehabil. 2000; 27: 22-32.
 11. Kampe T, Tagdae T, Bader G, Edman G, Karlsson S. Reported symptoms and clinical findings in a group of subjects with longstanding bruxing behaviour. J Oral Rehabil. 1997; 24:581-7
 12. Lavigne GJ, Rompré PH, Montplaisir JY. Sleep bruxism: validity of clinical research diagnostic criteria in a controlled polysomnographic study. J Dent Res. 1996;75:546-52.
 13. MacFarlane TV, Blinkhorn AS, Davies RM, Worthington HV. Association between local mechanical factors and orofacial pain: survey in the community. J Dent. 2003; 31(8): 535-42.
 14. Thompson BA, Blount BW, Krumholz TS. Treatment approaches to bruxism. Am FamPhysician. 1994; 49:1617-22.
 15. Bianchini EMG. Mastigação e ATM. In: Marchesan IQ. Fundamentos em fonoaudiologia: aspectos clínicos da motricidade oral. Rio de Janeiro: Guanabara Koogan; 1998. p.37-49.
 16. Dawson PE. Avaliação, diagnóstico e tratamento dos problemas oclusais. 2.ed. Porto Alegre: Artes Médicas; 1993.
 17. Durso BC, Azevedo LR, Ferreira JTL. Inter-relação ortodontia x disfunção da articulação temporomandibular. J Bras Ortodon Ortop Facial. 2002; 7: 155-60.
 18. Lavigne GJ, Lobbezoo F, Rompré PH, Nielsen TA, Montplaisir J. Cigarette smoking as a risk factor or an exacerbating factor for restless legs syndrome and sleep bruxism. Sleep. 1997; 20:290-3.
 19. Alves-Rezende MCR, Bertoz APM, Dekon SFC, Alves-Rezende LGR, Alves-Rezende ALR, Montanher IS, et al. Association between bruxism, alcohol and tobacco use among Brazilian students. Rev Odontol Araçatuba. 2011; 32:18-22
 20. Cuccia AM. Aetiology of sleep bruxism: a review of the literature. Recent Progress Med. 2008, 99:322-8.
 21. Clark GT, Tsukiyama Y, Baba K, Watanabe T. Sixty-eight years of experimental occlusal interference studies: what have we learned? J Prosthet Dent. 1999; 82:704-13
 22. Major M, Rompré PH, Guitard F, Tenbokum L, O'Connor K, Nielsen T, et al. A controlled daytime challenge of motor performance and vigilance in sleep bruxers. J Dent Res. 1999; 78:1754-62.
 23. Thie NM, Kato T, Bader G, Montplaisir JY, Lavigne GJ. The significance of saliva during sleep and the relevance of oromotor movements. Sleep Med Rev. 2002; 6:213-27.
 24. Malta DC, Porto DL, Melo FCM, Monteiro RA, Sardinha LMV, Lessa BH. Family and the protection from use of tobacco, alcohol, and drugs in adolescents, National School Health Survey. Rev Bras Epidemiol. 2011; 14:166-77.
 25. Molina OF, dos Santos Jr J. Hostility in TMD/bruxism patients and controls: a clinical comparison study and preliminary results. Cranio. 2002; 20:282-8.
 26. Lavigne GJ, Kato T, Kolta A, Sessle BJ. Neurobiological mechanisms involved in sleep bruxism. Crit Rev Oral Biol Med. 2003;14:30-46.
 27. Ohayon MM, Li KK, Guilleminault C. Risk factors for sleep bruxism in the general population. Chest. 2001; 119:53-61.
 28. Schneider C, Schaefer R, Ommerborn MA, Giraki M, Goertz A, Raab WH, et al. Maladaptive coping strategies in patients with bruxism compared to non-bruxing controls. Int J Behav Med. 2007; 14:257-61
 29. Lavigne GJ, Manzini C, Kato T. Sleep bruxism. In: Kryger MH, Roth T, Dement WC, editors. Principles and practice of sleep medicine. 4th. ed. Philadelphia: Elsevier Saunders; 2005. p. 946-59.
 30. Reding GR, Rubright WC, Zimmerman SO. Incidence of bruxism. J Dent Res. 1966; 45:1198-204
 31. Glaros AG. Incidence of diurnal and nocturnal bruxism. J Prosthet Dent. 1981; 45:545-9
 32. Lavigne GJ, Montplaisir J. Restless legs syndrome and sleep bruxism: prevalence and association among Canadians. Sleep. 1994; 17:739-43
 33. Ohayon MM, Li KK, Guilleminault C. Risk factors for sleep bruxism in the general population. Chest. 2001; 119:53-61.
 34. Laberge L, Tremblay RE, Vitaro F, Montplaisir J. Development of parasomnias from childhood to early adolescence. Pediatrics. 2000; 106:67-74.
 35. Rugh JD, Harlan J. Nocturnal bruxism and temporomandibular disorders. In: Jankovic J, Tolosa E, editors. Advances in neurology. New York: Raven Press; 1988. p. 329-41.
 36. Lavigne GJ, Manzini C. Sleep bruxism and concomitant motor activity. In: Kryger, Roth, D.

- ed. Principles and practice of sleep medicine. Philadelphia: W.B. Saunders; 2000. p. 773-85.
37. Lavigne GJ, Guitard F, Rompré PH, Montplaisir JY. Variability in sleep bruxism activity over time. *J Sleep Res.* 2001; 103:237-44.
38. Bader G, Lavigne GJ. Sleep bruxism: overview of an oromandibular sleep movement disorder. *Sleep Med Rev.* 2000; 4:27-43
39. Lavigne GJ, Rompré PH, Montplaisir J. Sleep bruxism: validity of clinical research diagnostic criteria in a controlled polysomnographic study. *J Dent Res.* 1996; 75:546-52.
40. Rugh JD, Harlan J. Nocturnal bruxism and temporomandibular disorders. *Advances Neurol.* 1988; 49:329-41.
41. Ikeda T, Nishigawa K, Kondo K, Takeuchi H, Clark GT. Criteria for the detection of sleep-associated bruxism in humans. *J Orofac Pain.* 1996; 10:270-82
42. Gallo LM, Lavigne GJ, Rompré PH. Reliability of scoring EMG orofacial events: polysomnography compared ambulatory recordings. *J Sleep Res.* 1997; 6:259-63
43. Velly-Miguel AM, Montplaisir J, Rompré PH, Lund JP, Lavigne GJ. Bruxism and other orofacial movements during sleep. *J Craniomandib Disord Fac Oral Pain.* 1992; 6:71-81
44. Kato T, Montplaisir J, Blanchet P, Lund JP, Lavigne GJ. Idiopathic myoclonus in the oromandibular region during sleep: a possible source of confusion in sleep bruxism diagnosis. *Mov Disord.* 1999; 14:865-71
45. Ware JC, Rugh JD. Destructive bruxism: sleep stage relationship. *Sleep.* 1988; 11:172-81.
46. Macaluso GM, Guerra P, Di Giovanni G, Boselli M, Parrino L, Terzano MG. Sleep bruxism is a disorder related to periodic arousals during sleep. *J Dent Res.* 1998; 77:565-73.
47. Saber M, Guitard F, Rompré PH, Montplaisir J, Lavigne GJ. Distribution of rhythmic masticatory muscle activity across sleep stages and association with sleep stage shifts (abstract). *J Dent Res.* 2002; 81(Spec Iss A):297
48. Gastaut H, Batini C, Broughton R, Fressy J, Tassinari CA. Étude électroencéphalographique des phénomènes épisodiques non épileptiques au cours du sommeil. In: *Le sommeil de nuit normal et pathologique.* Paris: Masson, Cie; 1965.
49. Halász P, Ujaszasi J, Gadoros J. Are microarousals preceded by electroencephalographic slow wave synchronization precursors of confusional awakenings? *Sleep.* 1985; 8:231-8
50. Lavigne GJ, Rompré PH, Poirier G, Huard H, Kato T, Montplaisir JY. Rhythmic masticatory muscle activity during sleep in humans. *J Dent Res.* 2001; 80:443-8
51. Alves-Rezende MCR, Bertoz APM, Aguiar SMHCA, Alves-Rezende LGR, Alves-Rezende ALR, Montanher IS, et al. Abordagem terapêutica nas desordens temporomandibulares: técnicas de fisioterapia associadas ao tratamento odontológico. *Arch Health Invest.* 2012; 1: 18-23
52. Alves-Rezende MCR, Silva JS, Soares BMS, Bertoz FA, Oliveira DTN, Alves-Claro APR. Estudo da prevalência de sintomatologia temporomandibular em universitários brasileiros de Odontologia. *Rev Odontol Araçatuba.* 2009; 30: 9-14.
53. Alves-Rezende MCR, Cortiglio S, Sant'Anna CBM, Alves-Rezende LGR, Montanher IS, Alves-Rezende ALR. Aplicação da acupuntura no tratamento da síndrome de Costen: relato de caso clínico. *Arch Health Invest.* 2012; 1(Spec): 15
54. Cortiglio S, Alves-Rezende MCR, Alves-Rezende LGR, Montanher IS, Alves-Rezende ALR. Estudo da associação entre bruxismo, consumo de álcool e tabaco em universitários brasileiros *Arch Health Invest.* 2012; 1 (Spec): 36.
55. Dallanora LJ, Faltin PP, Inoue RT, Santos VM. Avaliação do uso de acupuntura no tratamento de pacientes com bruxismo. *RGO.* 2004; 52(5):333-39.
56. Maciocia G. *Obstetrícia & ginecologia em medicina chinesa.* 10.ed. São Paulo: Roca; 2000.
57. Junying G, Zhihong S. *Medicina tradicional chinesa prática e farmacologia: teoria e princípios básicos.* São Paulo: Roca; 1996.
58. Yamamura Y. *Tratado de medicina chinesa.* Trad. Xi Wenbu, Beijing, China. Roca: São Paulo; 1993.
59. Hoppenfeld S. *Propedêutica ortopédica: coluna e extremidades.* Atheneu: São Paulo; 1996.
60. Sussmann D. *Acupuntura: teoria y práctica.* Buenos Aires: Kier; 2000.
61. Rosted P. Introduction to acupuncture in dentistry. *Br Dent J.* 2000; 189:136-40
62. Quaggio AM, Carvalho PSM, Santos JFF, Marchini L. A utilização da acupuntura em desordens craniomandibulares. *J Bras Oclusão ATM Dor Orofac.* 2002; 2: 334-7.
63. Ding L. *Acupuntura: teoria do meridiano e pontos de acupuntura.* São Paulo: Roca; 1996.
64. Ross J. *Combinações dos pontos de acupuntura: a chave para o êxito clínico.* São Paulo: Roca, 2003.
65. Wen TS. *Acupuntura clássica chinesa.* São Paulo: Cultrix; 1985.

CONFLICTS OF INTERESTS

The authors declare no conflicts of interests.

CORRESPONDING AUTHOR

Maria Cristina Rosifini Alves Rezende

rezende@foa.unesp.br

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