Comparison of Pain and Quality of Life in Bruxers and Patients With Myofascial Pain of the Masticatory Muscles

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Although it has been suggested that bruxism is a cause or a risk factor in myofascial pain of the masticatory muscles, the prevalence of pain in bruxers and its characteristics have not been assessed or compared to those of myofascial pain patients in general. In this study, self-reports of pain and quality of life were recorded on 100-mm visual analogue and five-point category scales from two research populations: (1) 19 nocturnal bruxers who participated in a polysomnographic study and (2) 61 patients with myofascial pain of the masticatory muscles with no evidence of bruxism who participated in a controlled clinical trial on the efficacy of oral splints. The data show that pain was more intense in those bruxers who reported pain than among the myofascial pain patients, even though pain was not the chief complaint of bruxers. Both conditions reduced the patient's quality of life, although pain patients (either bruxism or myofascial pain) appeared to be much more affected than bruxers who were pain-free. The fact that pain from bruxism was worst in the morning suggests that it is possibly a form of postexercise muscle soreness. Myofascial pain, which was worst late in the day, is likely to have a different etiology.
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The temporomandibular disorders (TMD) include myofascial pain, disc displacements within the temporomandibular joint and the arthritides.[1] Previous studies indicate that 43% to 50% of myofascial pain patients[2,3] and 26.6% to 66% of TMD patients[4–6] reported that they brux their teeth. This led to speculation that bruxism may constitute a risk or an etiologic factor for these conditions.[7–11] It has also been proposed that bruxism should be considered a condition separate from myofascial pain.[12] In fact, only some bruxers have facial pain.[4,7,8,10,11,13,14] To the authors' knowledge, the prevalence of pain in bruxers and its characteristics, particularly intensity and diurnal pattern, have not been assessed or compared to those of myofascial pain patients.

This study compares the pain reports of bruxers and myofascial pain patients and describes the effects of these conditions on their daily activities. Measurements of pain were made on visual analog scales (VAS), and quality of life was assessed using category scales (CAT). A short preliminary report has been published.[15]

Materials and Methods

Population

The sample populations were 19 subjects who participated in a polysomnographic study of nocturnal bruxism and 61 subjects with

myofascial pain of the masticatory muscles enrolled in a controlled clinical trial to evaluate the efficacy of oral splints.[16] They were French-speaking whites recruited through announcements published in local newspapers or referred by dentists to the research clinic. All subjects gave informed consent to procedures approved by the Institutional Human Subjects Ethics Committees (Hôpital du Sacré Coeur and Université de Montréal).

The bruxism group had 10 males and 9 females, healthy and drug-free, aged 22 to 36 years (mean = 27.7, ± 4.1 [SD]). All subjects had a chief complaint of nocturnal tooth grinding. They had become aware of their condition or were informed by their sleep partner that they made frequent grinding noises. They all participated in a descriptive study of nocturnal bruxism and its relationship to sleep states.[17] Bruxism was confirmed by polysomnographic recordings during two consecutive nights in a sleep laboratory, using the criteria of the International Classification of Sleep Disorders.[18]

In the myofascial pain group, there were 10 males and 51 females, aged 16 to 45 years (mean = 30.7 ± 7.5). The selection criteria for myofascial pain have already been described.[16] In summary, the patients had a chief complaint of frequent facial pain (at least four times per week) of at least 12 weeks duration and a positive report of tenderness to palpation of at least three sites in the masticatory muscles. Patients with clinical evidence or report of bruxism (severe tooth wear, self-awareness of bruxism, or sleep partner's report of nocturnal grinding noises) were excluded.

Experimental Procedures

During the screening visit, all subjects rated their current pain intensity on a VAS. Subjects who had pain were asked when it was usually worst and least (morning, afternoon, or evening). Using a five-point category scale (CAT: 0 = "pas du tout" [not at all], 1 = "un peu" [a little], 2 = "modérément" [moderately], 3 = "beaucoup" [a lot], 4 = "extrêmement" [extremely]), the subjects indicated to what extent their orofacial condition disturbed their sleep, social activities, and appetite; decreased their efficiency at work; made them feel tense and depressed; and made speech and mastication difficult. Any score from 1 to 4 was rated as a positive response. These quality of life variables were based on self-reports of symptoms associated with myofascial/TMD pain that have been published.[2,9,19-22]

Statistical Analysis

Between-group comparisons were made using analysis of variance (ANOVA) for data from the VAS. Chi-square tests were used for CAT data.

Results

Since the subjects from the two studies were recruited for different purposes and because of the differences in the sex distribution between groups, the data presented here must be interpreted with caution.

VAS Data

Although no bruxers complained about pain when they were first interviewed, the group had a mean pain intensity (± SE) of 18.3 ± 7.0 mm. This group mean is lower than that of myofascial pain patients (35.2 ± 2.7 mm). However, pooling the data from all bruxers hides the fact that there were 13 (6 females, 7 males) pain-free bruxers (VAS = 0 mm) while the 6 others (3 females, 3 males) reported high levels of pain (58.0 ± 10.0 mm), and this is significantly higher than that of myofascial pain patients ($t[65] = -2.46$, $P = .01$) (Table 1). All bruxers with pain reported that they still had pain when they were seen at the sleep laboratory approximately 1 month later.

Time of Pain Occurrence

Five of the six bruxers with pain (83.3%) reported that their pain was worst in the morning and least in the evening; only one had his worst pain in the evening. Opposite results were found for the myofascial pain group; the pain of the majority (50.8%) was worst in the evening and least in the morning. Only 19.7% had their highest pain in the morning (Fig 1).

Quality of Life

When data from all 19 bruxers were compared to those of the myofascial pain group, fewer bruxers than myofascial pain subjects reported disturbances of quality of life (Table 2). However, the prevalence of reduced quality of life was comparable between bruxers with pain and myofascial pain patients. Since no significant statistical difference was found between these two groups, their data were pooled and contrasted to those of the pain-free bruxers. Although patients from both of these pain groups appeared to be more affected than the pain-free bruxers for all variables, significant overall between-group differences were found for only

Table 1 Mean Pain Intensity (± SE) in Bruxers and Myofascial Pain Patients

All bruxers (n = 19)	Myofascial pain (n = 61)	Bruxers with pain (n = 6†)
18.3 ± 7.0 mm	35.2 ± 2.7 mm	58.0 ± 10.0 mm
	*	

†A subgroup from the 19 bruxers.
*($t(65) = -2.46$, $P = .01$).

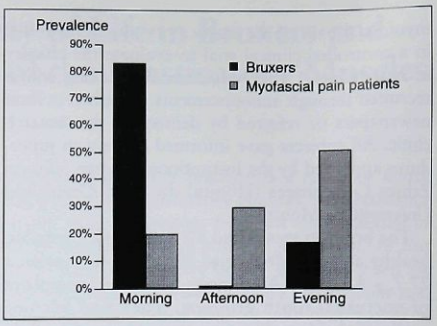

Fig 1 Most bruxers with pain experienced their highest pain in the morning. Half the group of myofascial pain patients had their worst pain in the evening.

Table 2 Reports of Quality-of-Life Disturbances (%)

	All bruxers (n = 19)	Myofascial pain (n = 61)	Bruxers with pain (n = 6†)		Bruxers without pain (n = 13†)
Disturbed sleep	36.8	59.0	66.7		30.8
Disturbed social activities	10.5	55.7	33.3		0.0
Disturbed appetite	5.3	50.8	16.7		0.0
Decreased efficiency at work	15.8	63.9	33.3		7.7
Feeling tense	42.1	83.6	83.3	*	23.1
Feeling depressed	10.5	45.9	33.3	**	0.0
Difficulty with speech	15.8	49.2	33.3		7.7
Difficulty with mastication	36.8	80.3	83.3		15.4
				***	

†Subgroups from the 19 bruxers.
*$\chi^2(2) = 9.5$, $P = .008$.
**$\chi^2(2) = 14.8$, $P = .0006$.
***$\chi^2(2) = 14.3$, $P = .0008$.

three variables: "decreased efficiency at work" ($\chi^2[2] = 9.5$, $P = .008$); "feeling tense" ($\chi^2[2] = 14.8$, $P = .0006$); and "difficulty during mastication" ($\chi^2[2] = 14.3$, $P = .0008$). For these items, the prevalence in the pain-free bruxers was significantly lower than in the other two groups pooled together: "decreased efficiency at work" ($\chi^2[1] = 4.6$, $P = .03$); "feeling tense" ($\chi^2[1] = 10.4$, $P = .001$); "difficulty during mastication" ($\chi^2[1] = 11.3$, $P = .0008$); Table 2.

Discussion

Although pain was not the presenting complaint of sleep bruxers, the data show that it was significantly more intense in those bruxers who reported pain than among myofascial pain patients. Pooling data from all bruxers hides the fact that some report high levels of pain while more than half are pain free. It is interesting to note that the mean pain reported by the bruxers with pain in our study (58 mm) exceeds the level of myofascial/TMD pain previously published (20 to 48.6 mm on VAS),[3,23,24] even though pain was not their chief complaint. Another difference is that the majority of bruxers with pain reported that their pain was worst in the morning, and most of the myofascial pain patients had their worst pain in the evening. Both conditions reduce the patients' quality of life, although pain patients appear to be more affected than bruxers who are pain free.

The finding that some bruxers experience pain confirms many earlier studies,[1,7,8,10,11,13,14,25] and the prevalence of pain in this bruxer group is within the range reported by others. For instance, Goulet et al[11] found that about one fifth of subjects who

were aware of parafunctional habits experienced jaw pain. Thirty percent of the bruxers who participated in the survey carried out by Houston et al[26] had pain in the face and jaws. Higher prevalences have been reported in some studies (44% to 59%),[10,13] but these authors associated any pain in the head, neck, or teeth with bruxism. On the other hand, other workers found no association or even a negative association between the signs and symptoms of bruxism and of TMD.[27,28] In these two studies, bruxism was equated with dental wear, although the validity of tooth wear as an indicator of current bruxism activity has been questioned.[29]

The existence of distinct subgroups of bruxers has been reported previously.[25] However, the authors believe that the present study is the first to show a striking contrast in the level of pain experienced by the two subgroups of bruxers (one without pain, the other with high pain). The cause of this dichotomy in pain levels is unclear, although it is possible that the difference can be found in the level or frequency of jaw muscle activity. Muscles can adapt rapidly to exercise, and in so doing, they become more resistant to the damaging effects of repeated bouts of the same exercise.[30–32] The pain-free subjects may be comparable to well-trained athletes whose muscular endurance has been improved by practice. This hypothesis is supported by our preliminary results showing that the mean number of bruxing episodes (both tonic or phasic) per sleep hour appear to be higher in the pain-free bruxers (unpublished data). On the other hand, pain experienced by the bruxers with pain may be analogous to postexercise muscle soreness induced by an excessive loading.[33,34] This suggestion is supported by the observation that the pain of the large majority was usually worst in the morning, then faded gradually during the day. In postexercise muscle soreness, damage can occur to the muscle fibers themselves and/or to the connective tissue, causing edema, inflammation, and swelling.[32,35–38] Because postexercise muscle soreness often follows work performed by untrained muscles,[39–41] it can be expected to be common in patients with occasional bruxism. Indeed, Rugh and Solberg[42] found that fluctuating pain reported by their patients coincided with the periods of high levels of electromyographic activity in the masseter muscles. However, there is always a possibility that bruxism and myofascial pain coexist, and it was recently shown that exercise increases pain in the majority of myofascial pain patients.[43] This could explain why the pain level in bruxers appeared to be significantly higher than that of myofascial pain patients who do not brux.

Our data also show that the negative impact on function is higher in patients who had pain than in bruxers who were pain free, particularly with respect to mastication. Pain on chewing is a common complaint of patients with TMD (37% to 68%),[2,3,19,22] particularly for those with myofascial pain (up to 81%).[3,43] The same proportion was found among bruxers with pain (83.3%). This is in accordance with the reports that pain can lead to impairment of muscular performance or limitation of movements in patients with myofascial pain of the masticatory muscles and elsewhere.[44–48]

The majority of patients, particularly those in pain, reported having disturbed sleep. This is not surprising because many chronic-pain patients complain that they sleep poorly.[49] Fricton et al[2] reported that 42% of their myofascial pain patients complained of poor sleep, and Harness et al[6] found that sleep disturbances were more prevalent in myofascial pain subjects (67%) than in patients with "internal derangement" or atypical facial pain. It is also one of the most characteristic symptoms associated with fibromyalgia.[50–52] Among the bruxers who were pain free, 30% reported disturbed sleep, perhaps because orofacial motor episodes are often associated with body movements[53–54] and periods of arousal.[55–59]

Conclusion

The present data indicate that there are at least two distinct subgroups of bruxers, one with no pain and another characterized by moderate to severe pain on awakening. Furthermore, the data suggest that bruxism and myofascial pain of the masticatory muscles may be distinct entities and that they are likely to have different etiologies. Because the number of bruxers included in the study was small and the two groups were studied at different times, further studies with larger populations need be done to confirm the observations.

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Resumen

Comparación del dolor y la calidad de vida entre pacientes que padecen de bruxismo o de dolor miofacial de los músculos masticatorios

Aunque se ha indicado que el bruxismo es una causa o un factor de riesgo en el dolor miofacial de los músculos masticatorios; la prevalencia del dolor en los bruxómanos y sus características todavía no han sido evaluadas o comparadas a aquellas de los pacientes que presentan dolor miofacial en general. En este artículo se registraron, auto-reportes sobre el dolor y la calidad de la vida, en análogos visuales de 100 mm y escalas categóricas de cinco puntos en dos poblaciones experimentales. La primera consistió de 19 bruxómanos nocturnos que habían participado en un estudio polisomnigráfico; y la segunda consistió de 61 pacientes que habían participado en un estudio clínico controlado, sobre la eficacia de férulas orales y que padecían de dolor miofacial en los músculos masticatorios sin haber evidencia de bruxismo. La información indicó que el dolor fue mas intenso en los bruxómanos que se quejaron de dolor, en comparación a los pacientes con dolor miofacial, aún cuando el dolor no fue la queja principal de los bruxómanos. Ambas condiciones desmejoraron la calidad de vida del paciente, aunque los pacientes que padecían de dolor (ya sea por bruxismo o por dolor miofacial) parecían estar mas afectados que aquellos que bruxaban pero que no tenían dolor. El hecho de que el dolor como consecuencia del bruxismo fue peor en la mañana indica que es posiblemente una forma de sensibilidad muscular después de hacer este ejercicio. Es posible que el dolor miofacial, el cual empeoró hacia el final del día, tenga una etiología diferente.

Zusammenfassung

Vergleich von Schmerz und Lebensqualität bei Bruxern und bei Patienten mit muskulärem Schmerz der Kaumuskulatur

Obwohl vorgeschlagen worden ist, dass Bruxismus eine Ursache oder ein Risikofaktor für myogene Schmerzen im Kausystem darstellt, sind Prävalenz und Qualität von Schmerzen bei Bruxern noch nicht beurteilt oder verglichen worden mit jenen von Patienten mit myogenen Schmerzen im Allgemeinen. Es werden Selbstberichte über Schmerz und Lebensqualität auf einer 100 mm VAS und auf einer 5-Punkte Kategorienskala bei zwei untersuchten Populationen festgehalten: *(1)* 19 nächtliche Bruxer, welche an einer polysomnographischen Studie teilnahmen und *(2)* 61 Patienten mit Kaumuskelschmerzen mit keinerlei Hinweisen auf Bruxismus, welche in einem kontrollierten klinischen Versuch über die Wirkung oraler Schienen teilnahmen. Die Resultate zeigten, dass der Schmerz bei Bruxern mit Schmerzen intensiver war als bei den Patienten mit myogenen Schmerzen, obwohl der Schmerz nicht die Hauptbeschwerde der Bruxer darstellte. Beide Zustände reduzierten die Lebensqualität der Patienten, auch wenn Schmerzpatienten (entweder bei Bruxismus oder bei myogenem Schmerz) wesentlich mehr als schmerzfreie Bruxer davon betroffen schienen. Die Tatsache, dass der Schmerz durch Bruxismus am Morgen am stärksten war, zeigt, dass es sich möglicherweise um eine Form von Muskelschmerz nach Belastung handelte. Muskulärer Schmerz, welcher sich am stärksten später im Tag manifestiert, dürfte eine andere Ätiologie haben.