The social and psychologic factors of bruxism

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Bruxism is a destructive habit that is defined as the nonproductive diurnal or nocturnal clenching or grinding of the teeth. This study investigated whether the combination of physical abnormalities, type A behavior pattern, and the perceived desirability and controllability of life stress are related to bruxism. The subjects for the study were 125 dental patients who were classified as bruxers or nonbruxers by a licensed dentist and who completed two measures, the Jenkins Activity Survey, and a modified version of the Holmes and Rahe Life Events Scale. Regression analyses indicate there is a difference in the separate impact of each variable. Type A behavior and physical abnormalities are significant in a stepwise analysis, while stress is not. Stress appears to be significant only in conjunction with type A behavior, and suggests that the combination of type A behavior, and stress is more predictive of bruxism than either of the individual variables. The linear combination of physical abnormalities, type A behavior, and stress is significant, and suggests that it is the best predictor of bruxism. (J PROSTHET DENT 1991;65:443-6.)

Table I. Correlations of physical abnormalities

<table>
<thead>
<tr>
<th>Jaw relation</th>
<th>TMJ</th>
<th>Muscle palpation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X = 4.1; S.D. = 0.17)</td>
<td>1.00</td>
<td>0.52*</td>
</tr>
<tr>
<td>T.M.J.</td>
<td>1.00</td>
<td>0.51*</td>
</tr>
<tr>
<td>(X = 0.23; S.D. = 0.05)</td>
<td>-</td>
<td>0.87*</td>
</tr>
<tr>
<td>Muscle palpation</td>
<td>-</td>
<td>1.00</td>
</tr>
<tr>
<td>(X = 0.58; S.D. = 10)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

N = 125.
*p > 0.001.
*t > 0.0001.

As a result of inconsistent support for a physical propensity to brux, other researchers proposed that certain psychologic factors are associated with bruxism. Many researchers believe that bruxism is related to certain personality characteristics such as aggressiveness, anxiety, hyperactivity, and a need for control.8-10 In addition to personality characteristics, other researchers have explored the effect of life events on bruxing. Rugh and Solberg11 and Funch and Gale12 found that bruxism correlated with both experienced and anticipated life stress, and they suggested that life stress plays an important role in the frequency, duration, and severity of bruxism.

Review of the literature on bruxism suggests that the personality characteristics described by many researchers such as Molton and Levin,13 are descriptions of what Freidman and Rosenman14 called a type A behavior pattern. The literature also suggests that the perception of the desirability and controllability of life stress may play an important role in bruxism, but only as it relates to the personality characteristics of the individual. In an attempt to bridge the gap between the psychologic and physical...
processes associated with bruxism, this study investigates bruxism as it relates to type A behavior, the product of the amount of life stress, and structural features that include the jaw and condylar relationship, muscle palpation, and internal derangement.

To investigate this hypothesis, great care has been taken to operationally define type A behavior and stress and to select valid and reliable measures of these variables. A brief description of the definitions and measures used is given to provide a clearer understanding of this investigation.

**DEFINITION AND MEASURES OF THE PSYCHOLOGICAL CONSTRUCTS**

**Type A.** Freidman and Rosenman define type A behavior as an “action-emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or other persons.” The type A personality consists of six patterns: (1) an intense desire to achieve; (2) a need to compete; (3) a persistent, sustained need for recognition; (4) seemingly continuous involvement in many activities; (5) a habitual propensity to accelerate the rate of execution of all mental and physical functions; and (6) an extraordinary mental and physical alertness.

Perhaps the most common impression that the public has of type A behavior can be described as hurried, accelerated, pressured, controlling, demanding, and highly ambitious. This description conjures up the picture of a person who is under high amounts of internally and externally induced stress, is driven to perform, is compelled to achieve, and to do these things quickly. Typical motor behaviors exhibited by type A personalities are excessive, rapid body movements characterized by tense facial and body muscle constriction, explosive speech intonations, hand or teeth clenching, and a general air of impatience.

**The measurement of type A behavior.** The Jenkin’s Activity Survey (JAS) was used to measure type A behavior. It is a reliable (r 0.85) instrument that provides an overall score for type A behavior, plus separate scores for three subfactors: impatience, job involvement, and hard-driving and competitive nature. This measure is frequently used and is well documented as a valid, reliable measure of type A behavior.

<table>
<thead>
<tr>
<th></th>
<th>Type A (X = 217; S.D. = 75)</th>
<th>Stress</th>
<th>Mechanical</th>
<th>Bruxism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>1.00</td>
<td>0.24†</td>
<td>0.17*</td>
<td>0.27‡</td>
</tr>
<tr>
<td>Stress</td>
<td>—</td>
<td>1.00</td>
<td>0.26†</td>
<td>0.26‡</td>
</tr>
<tr>
<td>Mechanical</td>
<td>—</td>
<td>—</td>
<td>1.00</td>
<td>0.28†</td>
</tr>
<tr>
<td>Bruxism</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.00</td>
</tr>
</tbody>
</table>

$N = 125.$

Life stress. Life stress is operationally defined in terms of self-reported life changes, and physical illness. In addition, it is necessary to conceptualize life stress in terms of the perceptions of its desirability and controllability. In this investigation, life stress is viewed as a multiplicative relationship between the amount of life changes and physical illnesses and the perceived desirability and controllability of these events.

**The measurement of life stress.** A modified version of Homes and Rahe’s Life Events Perception Scale (LEPS) was used in this investigation. This scale consists of questions to which respondents answer “yes” or “no” to a series of 57 items. For items answered “yes,” respondents then indicated their perception of the desirability and controllability of these events by using a 1 to 5 scale (1 = totally desirable/controllable; 5 = totally undesirable/uncontrollable). To derive stress ratings for each of the 57 items, values of 1 were assigned to “yes” and 0 to “no.” These values were then multiplied by the rating of desirability and controllability. For example, if a patient answered “yes” to item 14 and rated it 3 for desirability and 4 for controllability, the value for this item equals 12. To obtain the total stress score, values were summed across all items.

**MATERIAL AND METHODS**

Subjects in this study were 125 dental patients who were being treated at Loyola University of Chicago Dental Clinic, Department of Fixed Prosthodontics. For the Methodology, each patient completed both the JAS and the modified version of the LEPS. Patients were also asked to answer specific questions designed to determine their awareness of the possibility that they brux. Questions were in a “yes/no” format and included items such as “do you grind your teeth?” “do you frequently wake up with a headache?” and “do you notice that your teeth are wearing down?”

After the patients completed these measures, each was evaluated by the same dentist, who was blind to patients’ responses on the psychologic measures. The dental examination included evaluations of the anterior and posterior wear facets and types of occlusion (Angle class I, II, or III). Based on this evaluation, patients were classified as a “bruxer” or “nonbruxer.” Several types of malocclusion were also evaluated. These were eccentric interferences,
centric relation prematurities, and the general occlusion schemes. Signs and symptoms of temporomandibular joint (TMJ) disorders were evaluated without attempting to classify derangements other than noting the presence or absence of internal derangement or positive response to muscle palpation. From this evaluation, three scores were derived: a jaw and condylar relationship score, a TMJ score that included evidence of myofacial pain disorder (MPD) and internal derangement, and a muscle palpation score that showed evidence of palpation of the masseter, medial, lateral, and temporal muscles. On the basis of the correlation of these scores, it was decided to sum them and form an overall mechanical index (Table I). This index was then used in all analyses.

RESULTS

In order to determine the relationship between bruxism and the physical and psychologic measures, Pearson product-moment correlation coefficients were examined. Table II shows that stress, type A behavior, and the mechanical index are significantly related to bruxism, suggesting that each may play an important role in this disorder.

To obtain a clearer picture of how these factors may relate to bruxism, a stepwise multiple regression analysis was used. Only the type A behavior and mechanical index scores were entered into the equation. The stress score failed to meet the default criteria for inclusion.

To examine whether the combination of type A behavior and stress provides a fuller description of the bruxism process than does type A behavior alone, the difference between these equations was examined. This involved comparing the goodness-of-fit that was obtained from the combination of standardized type A behavior and stress scores to the goodness-of-fit that resulted from the individual variables. The result of this F ratio indicates that the equation for the combination of type A behavior and stress is different from the equation using each of these individual variables ($F(3,120) = 10, p > 0.01$).

To test whether bruxism is the result of a linear combination of type A, stress, and physical abnormalities, a “brux-type” score was created. This score was created by converting the total scores for the mechanical index, JAS, and LEPS into standardized $z$ scores and then summing them together. A bivariate regression analysis was employed using the “brux-type” variable defined above as predictive of bruxism. This relationship is significant (Multiple $R = 0.35; F(1,123) = 16, p = 0.0001$).

Finally, decision theory, as discussed by Miller et al., was used to assess the probability of correctly classifying bruxers and nonbruxers, given this set of variables. A two-by-two contingency table of the number of patients correctly classified as a bruxer/nonbruxer is given in Table III. This table shows that the constructs used in this investigation better differentiate nonbruxers than they do bruxers. For nonbruxers, 82% were correctly classified (specificity), whereas only 62% of bruxers were correctly classified (sensitivity).

Clinical implications

The results of this investigation suggest several items of interest to clinical situations. Since the results of this investigation show that bruxism is not only related to physical abnormalities but also to behavior and life-style, dentists may find that some patients will continue to brux no matter how much their dental condition is improved. In these patients, the dental materials used in restorative treatment should be resistant to wear and breakage. For instance, porcelain occlusal surfaces on posterior crowns or large posterior composite resin restorations may be contraindicated. Teeth weakened by large restorations would also be evaluated as potential cusp fractures due to the force produced by bruxing. The dentition may need to be protected with a prosthesis to be worn during times the patient is most apt to brux.

When presenting treatment plans, dentists should be aware of “type A characteristics” so as to enlist patient cooperation. Information should be presented to patients in personally relevant and salient ways, such as using audiovisual aids to show the effects of bruxism. This can help the patient comply with treatment recommendations, especially with the use of splints.

Finally, since bruxism may affect the outcome of treatment of TMJ disorders and chronic pain, steps should be taken to control parafunctional activity. It may become important to refer patients to a stress or life-style management program if they brux severely and continuously, especially if the patients are highly competitive and are under life stress. These programs, with the appropriate and indicated dental care, can help them develop alternative skills needed to prevent serious damage to their teeth and related structure.

SUMMARY

This investigation attempted to find a correlation among bruxism, physical abnormalities, the type A behavior pattern, and the perception of the desirability and controllability of stress. Results from regression analysis suggest the possibility that certain behavioral-emotional patterns and physical conditions may increase the likelihood to brux.

<table>
<thead>
<tr>
<th>Predicted bruxers</th>
<th>Absent actual negatives (AN)</th>
<th>True positives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>False positives</td>
<td>True positives</td>
</tr>
<tr>
<td>Predicted nonbruxers</td>
<td>True negative</td>
<td>False negatives</td>
</tr>
<tr>
<td>52</td>
<td>23</td>
<td>61</td>
</tr>
<tr>
<td>64</td>
<td>61</td>
<td></td>
</tr>
</tbody>
</table>
CONCLUSION

As argued in previous literature, the etiology of bruxism is debatable. While the data presented here do not resolve this debate, they do provide greater insight into the relationship between the psychologic and physical factors of bruxism. To fully understand bruxism, further research is needed. Since other research has documented significant effects of stress on bruxism, a clearer understanding of the effect of this factor is needed. It may be important to assess stress using different measures or to define stress in terms other than life changes and illnesses. Nevertheless, this study shows that both physical and psychologic factors are associated with bruxism.

REFERENCES


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