The Relationship between TMJ Dysfunction, Reported Bruxism and Recurrent Headaches

Odnos između temporomandibularne disfunkcije, bruksizma i povratnih glavobolja

Summary

This study investigates the relationship between reported bruxism, recurrent headaches and signs of TMJ dysfunction. 244 consecutive patients attending the Examination and Emergency Primary Care Unit for dental treatment, were examined for signs of TMJ dysfunction. The patients also completed a questionnaire which determined the prevalence of recurrent headaches and habitual bruxism. Results were analysed using cross-tabulation to obtain chi-square values to investigate associations between reported bruxism, recurrent headaches and TMJ dysfunction. There was a highly significant relationship between:

- TMJ and masticatory muscle pain and recurrent headaches (p<0.005);
- Reported bruxism and TMJ and masticatory muscle pain (p<0.001), and a significant relationship between:
  - Reported bruxism and recurrent headaches (p<0.05).

The frequency of the signs and symptoms provides support for closer liaison between dentists and other disciplines to provide improved education, treatment and research in the fields of headaches and orofacial pain.

Key words: TMJ dysfunction, bruxism, headaches

Introduction

Clinical and epidemiological studies have demonstrated a significant relationship between symptoms of temporomandibular joint (TMJ) dysfunction and recurrent headaches (1,2). Magnusson and Carlsson (1) for example reported that 70% of patients referred to a clinic for treatment of TMJ dysfunction also suffered regular headaches compared with 34% of a control group. A high incidence of sy-
Symptoms of TMJ dysfunction have also been reported in groups of headache patients (3-5).

Experimental bruxism can lead to headache and symptoms of TMJ dysfunction (6) and clinical studies have demonstrated that the incidence of reported bruxism is significantly higher in headache patients than in control groups (2).

The purpose of the present study was to further investigate the association between symptoms of TMJ dysfunction, reported bruxism and recurrent headache by determining the incidence and relationships of these parameters in a single population.

**Materials and Methods**

Consecutive patients attending for dental treatment at the Examination and Emergency Primary Care Unit of the Dental Hospital over a five day period were included in the study. Patients below the age of 16 and patients with headaches that could be related to a known medical condition (e.g. hypertension) were excluded. All patients included in the study were asked the following questions:

1. Do you have headaches once a month or more?
2. Do you often clench or grind your teeth?

Those patients who responded yes to the first question were asked a further set of questions to provisionally diagnose and classify the headaches using diagnostic criteria proposed by Blau (7-9) (Table 1) which enables a provisional headache diagnosis to be assigned.

All patients were then examined by one clinician (IC) who was unaware of the answers to the questions relating to the headaches. The lateral aspects of the TMJ joints were gently palpated in order to detect crepitus of clicking associated with uncoordinated movement of the head of the mandibular condyle during opening and closing of the mouth. The joints were then firmly palpated laterally and posteriorly and patient was asked whether this palpation caused pain.

Left and right temporalis, masseter and lateral pterygoid muscles were palpated according to standard procedures described by Hansson and Nilner (10) and the patient was again asked whether pal-

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**Table 1. Headache diagnosis (after BLAU, J.N. 1985)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Negative</td>
</tr>
<tr>
<td>2</td>
<td>Common migraine</td>
</tr>
<tr>
<td>3</td>
<td>Classical migraine</td>
</tr>
<tr>
<td>4</td>
<td>Tension headache Type I</td>
</tr>
<tr>
<td>5</td>
<td>Tension headache Type II</td>
</tr>
<tr>
<td>6</td>
<td>Combination headache</td>
</tr>
<tr>
<td>7</td>
<td>Other headache</td>
</tr>
</tbody>
</table>

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Results

The investigation included 244 patients (123 males, 121 females). The mean age was 38 years (standard deviation 17 years).

56 patients (23%) were aware of habitually clenching of grinding their teeth.

88 patients (36%) reported suffering from recurrent headache, i.e., at least once a month whilst of these, 32 (13%) reported suffering from headaches twice a week or more. The provisional diagnosis of these headache patients is shown in Table 2.

The findings of the TMJ examination are given in Table 3. 88 patients (36%) were adjudged to have tenderness to palpation of one or more TMJs or muscles of mastication. Table 4.

Of those 56 patients who reported bruxing, 32 (57%) had TMJ or muscle tenderness whilst of those 188 that were not aware of bruxing, only 56 (30%) had tenderness. This was a highly significant association: Chi square=15.2 df=1 p=0.0005.

Table 2. Provisional headache diagnoses

<table>
<thead>
<tr>
<th>Headache more than once/month</th>
<th>Yes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisional diagnosis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Classic migraine</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>(b) Common migraine</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>(c) Tension Type I</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>(d) Tension Type II</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>(e) Combination</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>(f) Other</td>
<td>42</td>
<td>17</td>
</tr>
<tr>
<td>Total migraine headaches (a, b and e)</td>
<td>30</td>
<td>12</td>
</tr>
<tr>
<td>Total tension headaches (c and d)</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Other headaches (f)</td>
<td>42</td>
<td>17</td>
</tr>
</tbody>
</table>

The findings of the TMJ examination are given in Table 3. 88 patients (36%) were adjudged to have tenderness to palpation of one or more TMJs or muscles of mastication. Table 4.

Of those 156 that reported no recurrent headache, 27 (17%) were aware of habitual clenching or grinding. Of those 30 with a provisional diagnosis of migrainous headache 9 (30%) were aware of clenching or grinding whilst of those 58 with other headaches 20 (34%) were aware of clenching or grinding. Whilst the magnitude of this association suggests a relationship between clenching and both migrainous and other headaches it was considered that the numbers in the headache subgroupings were too small to justify statistical analysis. There was, however, a significant relationship between reported bruxing and all headaches. Chi square=8.0 df=2 p<0.018.

Of the 156 (64%) with no recurrent headaches 42 (27%) had TMJ or muscle tenderness whilst 16 (53%) of the 30 migraine patients and 30 (52%) of the 58 patients with other headaches had tenderness. Again, the headache numbers are considered relatively small but there is a highly significant rela-
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TMJ dysfunction, bruxism and headaches

tionship between TMJ and muscle tenderness and recurrent headache. Chi square=15.2 df=2 p=0.0005.

Discussion

Standard muscle and joint palpation procedures were used to detect the presence of signs of TMJ dysfunction (9) and all patients were examined by the same examiner in order to exclude inter-observer variability (11).

The results of muscle and joint palpation must be interpreted with caution. In particular Johnstone and Templeton (12) suggested that it is not possible to palpate the lateral pterygoid muscle directly and that pressure distal to the pterygoid notch can also elicit pain from the superficial head of medial pterygoid and/or insertion of temporalis.

The findings of muscle and joint palpation mirrored the high incidence of objective signs of TMJ dysfunction reported in previous epidemiological surveys (1).

Methods and criteria for detecting joint sounds differ in various studies and this will affect the results. The present study did not include the use of a stethoscope and the recorded incidence of joint sounds was 32%. It is of interest to note that an extensive review of the literature (13) concluded that 30% is and approximate mean for joint sounds in most non TMJ dysfunction patient populations.

For the purpose of this study, recurrent headache was defined as being a headache that occurs more than once per month. The incidence of such headaches was high (36%). This finding is in agreement with previous investigations (14,15).

Twenty - three per cent of patients reported that they were aware of habitually grinding or clenching their teeth. This figure may underestimate the true number since people may be unaware of unconscious parafunction during the day or of nocturnal bruxism during their sleep. Marbach et al. (16) however cautioned that dentists may inform patients that they habitually clench or grind their teeth merely because they have symptoms of TMJ dysfunction. Nonetheless a significant relationship (p<0.001) between reported clenching and grinding and symptoms of TMJ dysfunction was demonstrated.

The diversity of conditions causing headache and orofacial pain is illustrated by the International Headache Society’s Classification of Headache Disorders, Cranial Neuralgias and Facial Pain (17) in which thirteen separate categories are recognized. It has been estimated that more than 90% of patients with headaches referred to outpatient departments for diagnosis and treatment are muscle contraction or migraine types (8).

Blau (7-9) has outlined specific diagnostic criteria for the categories of migraine and muscle contraction headaches and by use a questionnaire a provisional diagnosis can be made. Accurate diagnosis of a headache necessitates a full history and examination by a qualified medical practitioner and the limitations of the questionnaire approach to diagnosis must be emphasized. In this study the questionnaire proved useful for provisionally diagnosing migraine headaches. No such distinct separation occurred for many other recurrent headaches (Table 2). 42 of 88 patients with recurrent headaches could only be classified as ‘other’ headache. Whilst the magnitude of the association suggested a relationship between bruxing/clenching and migraine headaches, numbers were too small to justify statistical analysis.

A significant relationship was demonstrated however between both TMJ and masticatory muscle pain and all recurrent headaches and bruxism and all recurrent headaches. These correlations support the findings of clinical investigations of patients in headache clinics (3-5, 18,19).

General dental practitioners’ knowledge of crani-ofacial anatomy and related disorders of these structures should enable them to readily diagnose common TMJ disorders. Dental students and dentists are less well instructed in differential diagnosis of headaches and in the important relationships of headaches with TMJ dysfunction and bruxism confirmed by this study.

Relatively simple treatment methods will provide improvement of symptoms of many patients with TMJ dysfunction and associated recurrent headaches. Treatment techniques include behaviour modification, occlusal splints and the appropriate use of drugs for acute cases. The work of Quayle et al. (20) has demonstrated that inter-occlusal splints might also benefit many patients suffering recurrent headaches that are not associated with symptoms of TMJ dysfunction.
Facial pain and recurrent headaches impose a significant burden on the community in terms of suffering and days off school and work (21,22). The results of the present study provide support for closer inter-disciplinary cooperation to provide improved education, treatment and further research in the field of headaches and orofacial pain.

Conclusions

1. This study demonstrated a significant between:
   (i) Bruxism and TMJ pain dysfunction \( p < 0.001 \)
   (ii) Bruxism and recurrent headache \( p < 0.05 \)
   (iii) TMJ pain dysfunction recurrent headache \( p < 0.001 \).

2. They frequency of signs and symptoms provides support for closer interdisciplinary liaison to provide improved education, treatment and further research in the field of headaches and orofacial pain.

Acknowledgments

The authors are also grateful to Dr E Absi for allowing access to his patients.

References


