Is inadequate swallowing associated to masticatory myofascial pain?*
A deglutição inadequada está associada à presença de dor miofascial mastigatória?

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SUMMARY

BACKGROUND AND OBJECTIVES: Muscles of mastication, involved with the pathophysiology of the masticatory myofascial pain, also participate in the swallowing function. Given the controversial results about the relationship between temporomandibular dysfunction (TMD) and swallowing abnormalities, this study aimed at checking the presence of swallowing function abnormalities in females with masticatory myofascial pain.

METHOD: Three swallowing tests (one solid and two liquid) were performed in 30 females with myofascial pain (study group = SG) and 30 healthy females (control group = CG). Changes in swallowing patterns, such as periorbicular muscles contraction, chin contraction, head movements, swallowing followed by noise, choking, lower lip interposition, pain after swallowing and swallowing with anterior projection of the tongue were observed during the three tests. Results were described and compared between groups by Chi-square and Fisher’s Exact tests with significance level of 0.05 and confidence interval of 95%.

RESULTS: SG participants had a higher chance of atypias during one liquid swallowing test [Chi-square test; p < 0.05; OR: 3.29; CI 95% (1.08 – 9.95)]. However, there has been no association between TMD and atypical swallowing features evaluated in all tests.

CONCLUSION: Inadequate swallowing was associated to masticatory myofascial pain only during liquid ingestion. However, it was not possible to associate a specific atypia to TMD in this sample.

Keywords: Speech therapy, Swallowing, Temporomandibular joint dysfunction syndrome.

RESUMO

JUSTIFICATIV A E OBJETIVOS: Os músculos da mastigação, envolvidos na fisiopatologia da dor miofascial mastigatória, também participam da função de deglutição. Diante dos resultados controversos sobre a relação entre disfunção temporomandibular (DTM) e alterações na deglutição, o objetivo deste estudo foi verificar a presença de alterações na função da deglutição em mulheres com dor miofascial mastigatória.

MÉTODO: Três testes de deglutição (um sólido e dois líquidos) foram realizados em 30 mulheres com dor miofascial (grupo de estudo = GE) e 30 mulheres saudáveis (grupo controle = GC). Alterações nos padrões de deglutição como contração da musculatura periorbicular, contração mentual, movimentos de cabeça, deglutição acompanhada de ruído, engasgos, interposição de lábio inferior, dor após deglutição e deglutição com projeção de língua para anterior foram observadas durante os três testes. Os resultados foram descritos e comparados entre os grupos através dos testes Qui-quadrado e Exato de Fisher com nível de significância de 0,05 e intervalo de confiança a 95%.

RESULTADOS: Participantes do GE apresentaram chance maior de presença de atipias durante um dos testes de deglutição de líquido [teste Qui-quadrado; p < 0,05; OR: 3,29; IC 95% (1,08 – 9,95)]. Entretanto, não houve associação entre a presença de DTM e características atípicas da deglutição avaliadas em todos os testes.
CONCLUSÃO: Deglutição inadequada esteve associada com a presença de dor miofascial mastigatória apenas durante a ingestão de líquido. Entretanto, não foi possível associar um tipo específico de atipia à DTM nesta amostra.

Descritores: Deglutição, Fonoaudiologia, Síndrome da disfunção da articulação temporomandibular.

INTRODUCTION

Temporomandibular dysfunction (TMD) is a collective term including clinical problems involving masticatory muscles, the temporomandibular joint (TMJ) and associated structures, which is identified as the major cause for non dental pain in the orofacial region.

Masticatory muscles are involved with miofascial pain pathophysiology, a TMD subtype, and the presence of pain at palpation is necessary to fill diagnostic criteria. These muscles participate in swallowing, in elevating the mandible during the oral phase and in allowing teeth contact and lips sealing.

Some studies have observed association between TMD and inadequate swallowing features with controversial results, both in adult and pediatric patients. Abnormal swallowing patterns were present in 76% of patients with TMD and this has suggested that patients could adapt the swallowing function to avoid pain. A correlation between facial pain and abnormal swallowing was observed and was attributed to digastric muscle hyperactivity. Although pointing out that approximately 19.6% of patients had atypical swallowing, a study evaluating TMD patients has not found association with atypical swallowing, but has highlighted features such as sudden laryngeal movements, periorbicular muscles contraction and anterior head compensation.

A study with children between 3 and 5 years of age has observed that in this age group atypical swallowing was positively related to TMD signs and symptoms. However, authors suggest that atypical swallowing may be a common finding in this age group caused by artificial sucking, which leads to major morphological changes. A study comparing children with and without TMD has observed no association between abnormal swallowing and TMD. Authors have suggested that the function might have been altered by other factors, such as mixed dentition or malocclusion.

Given the controversial results about the correlation between TMD and swallowing, this controlled study aimed at checking the presence of swallowing function changes in females with masticatory miofascial pain.

METHOD

This transversal, case control, double blind study was carried out in the Clinic of the Speech Therapy Course, University of Franca (UNIFRAN) with a sample of 60 females aged between 18 and 65 years, consecutively seen and during first visit, in a private dentistry clinic of the city of Franca, with orofacial pain complaint or for routine clinical exam, who fulfilled inclusion and exclusion criteria.

Exclusion criteria were: upper, lower or both total prosthesis, neurological disorders, individuals who had suffered trauma or tumors in head and neck, and individuals with brackets. Participants with the following occlusion factors were also excluded: skeletal open bite, unilateral crossbite, absence of 5 or more teeth, deep overbite and intense overjet.

Participants were divided in two groups: control group (CG) and study group (SG).

SG (n = 30) was composed of patients with miofascial pain with and without mouth opening limitation (axis I, diagnosis IA and IB) according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) classification criteria. For better sample accuracy during masticatory muscles palpation, only patients with pain in one of 12 sites were included: anterior, middle and posterior portion or origin of the temporal muscle, masseter muscle body and insertion. Pain at palpation of these areas should be familiar to patients, endorsing location reported in the RDC/TMD questionnaire.

For CG (n = 30) female patients seen for routine exams without TMD signs and symptoms for at least six months and with no need to oral rehabilitation were selected.

Participants came to the Speech Therapy Clinic, UNIFRAN in day and time scheduled by telephone, from April to August 2009, for swallowing evaluation following the Orofacial Motility Evaluation Protocol. Participants were informed about the objectives of the research and have signed a free and informed consent term.

Three tests were used to evaluate swallowing function, one with solid food (French bread) and two with liquids (water). Participants sat in front of the researchers with body posture vertically erect to the horizontal plane, head oriented in parallel to the Frankfurt plane, sagittal axis perpendicular to horizontal axis and with feet on the ground.

In the first test, solid food was offered and they were asked to chew and swallow normally. In the second test a transparent glass with water was offered and they were asked to drink the water as usual. In the last test they
were asked to keep the water in the mouth until the researcher would request them to swallow. Without touching participants, swallowing pattern changes were observed, such as: periorbicular muscles contraction, chin contraction, head movements, swallowing followed by noise, choking, lower lip interposition, pain after swallowing and swallowing with anterior projection of the tongue.

To prevent unbalancing the process by masking some unreal swallowing type, lips were not opened by the researchers. At the end of the evaluation we have asked whether participants had swallowing difficulties. This study has considered that participants had inadequate swallowing when at least one atypical feature was present during each test.

It has to be stressed that, during evaluation, researchers did not know the group to which participants belonged. Patients’ condition, for both groups, was only known through information given by the dentist, who was responsible for selecting the groups at evaluation completion.

Komogorov-Smirnov test was applied to determine age distribution and then t test was applied. Data were described for each group. Chi-square and Fisher Exact tests were used to check possible associations between the presence of swallowing changes and the groups during the three tests, and Odds ratio was calculated to check the ratio between groups taking as reference CG. The Minitab software was used for such analyses with the following values: significance level 0.05 and confidence interval of 95%.

This study was approved by the Ethics and Research Committee, University of Franca, under protocol 020/2009.

RESULTS

Mean age for SG (n = 30) was 39.4 years and for CG (n = 30) it was 36.8 years, without difference between groups (2-t test; p = 0.41).

Three swallowing tests were performed. Three SG participants (10%) and five CG participants (16.67%) had normal swallowing in the three tests. There has been no significant difference between groups (Table 1).

Table 1 – Results of the three tests with regard to swallowing (adequate/inadequate) and the presence of atypias.

<table>
<thead>
<tr>
<th>Test I - Solid</th>
<th>Test II - Liquid</th>
<th>Test III - Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swallowing*</td>
<td>GE n (%) GC n (%)</td>
<td>GE n (%) GC n (%)</td>
</tr>
<tr>
<td>Adequate</td>
<td>11 (36.7) 17 (56.7)</td>
<td>7 (23.3) 15 (50)</td>
</tr>
<tr>
<td>Inadequate</td>
<td>19 (63.3) 13 (43.3)</td>
<td>23 (76.7) 15 (50)</td>
</tr>
<tr>
<td>Atypias**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periorbicular muscle contraction</td>
<td>12 (40) 15 (50)</td>
<td>11 (36.7) 11 (36.7)</td>
</tr>
<tr>
<td>Chin contraction</td>
<td>8 (26.7) 7 (23.3)</td>
<td>6 (20) 4 (13.3)</td>
</tr>
<tr>
<td>Head movements</td>
<td>9 (30) 5 (16.7)</td>
<td>4 (13.3) 3 (10)</td>
</tr>
<tr>
<td>Lower lip interposition inferior</td>
<td>4 (13.3) 3 (10)</td>
<td>11 (36.7) 6 (20)</td>
</tr>
<tr>
<td>Anterior projection of the tongue</td>
<td>1 (3.3) 1 (3.3)</td>
<td>4 (13.3) 3 (10)</td>
</tr>
</tbody>
</table>

* Chi-square test; ** Fisher Exact Test; SG = study group; CG = control group.
Is inadequate swallowing associated to masticatory myofascial pain?

During the solid swallowing test, SG participants had a higher number of atypical features. Head movements (30%) and difficult swallowing (23.33%) were more present as compared to CG (16.67% and 3.33%, respectively), although without significant difference. Head movement was significant in TMD patients during the second liquid test. With head movement the oropharyngeal space is increased, thus helping swallowing. Due to masticatory inefficiency, TMD patients may present excessive swallowing effort. So, for having pain in mandible elevator muscles, these patients may have presented swallowing difficulties and may have moved their heads in an attempt to compensate pain.

TDM patients had three times more chance of inadequate swallowing as compared to CG during the first liquid swallowing test (OR = 3.28; CI 95%; OR 1.08-9.95). More SG patients had lower lip interposition (36.67%) as compared to CG (20%), although without significant difference. Lower lip interposition during swallowing is due to the need to seal the lips and indicates the presence of adapted swallowing, probably due to the presence of malocclusion, with excessive overjet. This study has not directly evaluated occlusion and facial type, but the exclusion of participants needing oral rehabilitation, using prosthesis or brackets and with severe malocclusion factors, such as skeletal open bite, unilateral crossbite and intense overjet may have decreased the impact of this bias in this study and may justify the fact that differences were not significant.

During the first liquid swallowing test, participants were asked to swallow as usual. In the second test, they were asked to keep the liquid in the mouth until the requested moment. There has been no difference in this test among features presented by the groups. It is possible that in the second test, participants have better controlled their swallowing, thus justifying such difference.

This was a controlled study using validated criteria for TMD diagnosis; however, results cannot be generalized for the population since the sample consisted of patients looking for private dentistry office and with a specific type of TMD. The analysis of occlusion, facial type and more specific tests are needed to analyze swallowing features.

We suggest that further studies with prospective methodology, control group and adequate sample size, should evaluate whether the presence or absence of TMD, according to all its subtypes, interferes with patients’ swallowing.
CONCLUSION

Inadequate swallowing was associated to the presence of masticatory miofascial pain in females only during liquid ingestion. However, it was not possible to associate a specific atypia to temporomandibular dysfunction in this sample.

REFERENCES


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