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Electromyographic ratio of masseter and anterior temporalis muscles in children with and without temporomandibular disorders

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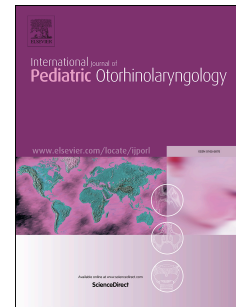
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1 **ELECTROMYOGRAPHIC RATIO OF MASSETER AND ANTERIOR TEMPORALIS**
2 **MUSCLES IN CHILDREN WITH AND WITHOUT TEMPOROMANDIBULAR**
3 **DISORDERS**

4
5 **Abstract**

6
7 **Objective:** This study investigated differences in surface electromyography (sEMG)
8 activity of the masseter and anterior temporalis muscles in children with and without
9 temporomandibular disorders (TMD). **Participants:** Thirty-four children aged 8-12
10 years were recruited, comprising 17 children with TMD and 17 without TMD (control
11 group [CG]). The children were quasi-matched for sex, age, weight, and height. sEMG
12 data were obtained using Myosystem® Br-1 equipment with 12 channels to evaluate
13 the bilateral masseter, anterior temporalis, and suprahyoid muscles. For sEMG
14 analysis, raw and normalized root mean square (RMS) values were obtained at rest
15 and during maximum clenching. The sEMG ratios of the raw RMS data of the bilateral
16 masseter in relation to the anterior temporalis muscles (sEMG-M/AT ratio) were also
17 assessed. Mann-Whitney tests ($p \leq 0.05$) were used to compare sEMG ratio between
18 TMD group and CG. **Results:** A significant prevalence of pain during chewing (53% vs.
19 0%, $X^2=5.87$, $p=0.01$), TMJ pain (58% vs. 0%, $X^2=6.67$, $p=0.01$), neck pain (58% vs.
20 18%, $X^2=3.77$, $p=0.05$) and pain in the temples (47% vs. 6%, $X^2=5.44$, $p=0.02$) was
21 identified in the TMD group compared to CG. Our results revealed lower sEMG-M/AT
22 ratios during maximum clenching ($p=0.01$) in children with TMD compared to those in
23 the asymptomatic CG **Conclusion:** The results showed that children with TMD
24 preferentially used their temporalis muscles during maximum voluntary clenching,
25 probably as a consequence of nociceptive inputs in order to obtain pain relief.

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27
28 **Key words:** Temporomandibular Disorders, Electromyography, Children, Pain

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