Headache Medicine

Relationship between Central Sensitization and Clinical Features of Migraine

Felipe Daniel Sambini; Gabriella de Almeida Tolentino; Adrila de Cassia Cabral Norato; Juliana Pradela; Fabiola Dach; Debora Bevilaqua Grossi

Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, São Paulo, Brazil.

Introduction

Central sensitization (CS) is highly prevalent in individuals with migraine. The clinical manifestation of CS can be presented through cutaneous allodynia (CA) and hyperalgesia. The presence and severity of CA are an indication of susceptibility to migraine chronification, since the frequency of CA increases as migraine attacks increase. Even though the presence of CS in migraine patients has been established, the relationship between sensitization and the clinical features of migraine is still being discussed. Objective: To evaluate the correlation between clinical migraine variables, such as frequency, intensity and duration, in years, of headache, with CS, measured by the Central Sensitization Inventory (CSI), Allodynia Symptom Checklist (ASC-12) and the Pressure Pain Threshold (PPT).

Methods

The local Research Ethics Committee (5.253.045/2022) approved this cross-sectional study. One hundred individuals diagnosed with migraine according to the third edition of the International Classification of Headache Disorders were recruited. Sociodemographic data were collected, along with the ASC-12 and CSI questionnaires, and the PPT of the craniocervical muscles (temporal, trapezius, sternocleidomastoid, suboccipital, scalene, and levator scapula). The Shapiro-Wilk test was performed to verify data distribution of data and then Pearson's correlation was used to verify the association between CSI and the clinical features of migraine (headache frequency, intensity and duration). A posteriori, the correlation between the CSI and ASC-12 and between the CSI and the PPT of the craniocervical muscles was performed. For the interpretation of the magnitude of the correlation, a range of -1 to 1 was considered, considering <0.3 as a weak correlation, between 0.3 and 0.7 a moderate correlation and >0.7 a strong correlation. To identify the craniocervical muscles with lower and higher sensitivity, through the PPT, ANOVA was performed.

Results

The evaluated individuals had a mean age of 36.6 years (standard deviation [SD]= 9.7), with a mean body mass index of 26.1 (SD= 4.2). Mean illness duration was 17.1 (SD=10.1), with mean frequency of 13.8 (SD=8.8) headache days per month, with mean intensity of 7.9 (SD= 1.8). The mean score of the CSI questionnaire was 50 points (SD=15.8) and the ASC-12 was 6.4 (SD=3.8). A weak significant correlation was found between migraine intensity and CSI (r= 0.22; p<0.05), between migraine frequency and CSI (r= 0.27; p<0.001) and between the frequency and the ASC-12 (r= 0.24; p<0.001). The illness duration correlates moderately with ASC-12 and significant correlations were observed between the frequency of migraine and the PPT of the trapezius (r= -0.32; p<0.05), sternocleidomastoid (r= -0.36; p<0.05) and suboccipital (r= -0.33; p<0.05) muscles. The correlation between the ASC-12 and the CSI was moderate (r= 0.35; p<0.001). No statistically significant correlation was observed between craniocervical muscle PPT and questionnaire scores (CSI and ASC-12). According to the ANOVA from the PPT, the most sensitive muscle was scalene and the most less sensitive muscle was the trapezius.

Conclusion

The CSI correlates with the frequency and intensity of migraine, the PPT and the ASC-12 correlate with the frequency of migraine and illness duration. Therefore, the CSI and PPT could be used to identify migraine individuals who are more sensitive to pain and more likely to develop central sensitization. However, we cannot suggest that these tools be used alone to assess central sensitization in these patients.

Keywords: Migraine Disorders, Central Sensitization, Cutaneous Allodynia