



## Central Sensitization and Neck Disability in individuals with Temporomandibular Disorders

Luana Maria Ramos Mendes, Jene Caroline Silva Marçal, Luana Denadai Oliveira Menezes, Debora Bevilaqua Grossi.

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

### Background

The association between Temporomandibular Disorders (TMD) and neck pain has already been demonstrated in several studies. There is moderate to strong evidence that individuals with TMD have worse self-reported neck disability. These two conditions, as they are chronic pain, are characterized by hypersensitivity induced by Central sensitization (CS).

### Objective

The present study aimed to determine the correlation between the Central Sensitization Inventory (CSI) and Neck Disability Index (NDI) scores and if self-reported CS-related symptoms differ according to neck disability levels in individuals with TMD.

### Methods

A cross-sectional study was conducted in a sample of 52 individuals diagnosed with TMD, aged between 18 and 40 years of both genders. Edentulous individuals who do not use a prosthesis, with a history of systemic diseases, neurological disorders, history of trauma, or surgery in the head or neck less than one year ago, and who were incapable of cooperating, were excluded. The diagnosis was made using Axis I of the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) instrument, which divides TMD into groups according to established criteria. The neck disability was assessed by the NDI. It consists of 10 questions; each question can receive a score from 0 to 5 (0 = no pain or disability and 5 = total pain or disability), and the sum of the scores determines the levels of disability. More specifically, higher scores imply greater disability. Scoring interpretation is: 0-4 = no disability; 5-14 = mild disability; 15-24 = moderate disability; 25-34 = severe disability; over 34 = complete disability. The CS was evaluated using the CSI, a widely used self-administered questionnaire for assessing CS-related symptoms in clinical studies. Part A of the CSI comprises 25 CS-related items with total scores ranging from 0 to 100. The higher the scores, the more likely the involvement of mechanisms consistent with central sensitization. Part B of the CSI assesses whether seven CS-related diseases were previously diagnosed. Mean, standard deviation and frequency were analyzed to characterize the sample. The correlation between the CSI and NDI scores was verified using the Spearman correlation. The difference in self-reported symptoms of CS (CSI score) between the neck disability levels was calculated by One-way ANOVA. The Bonferroni test was conducted as a post-hoc test analysis.

### Results

52 individuals of both sexes were evaluated, of which 45 (86%) were women. The mean age of the sample was 30.27 ( $\pm 6.13$ ) years. Most had a diagnosis of mixed TMD (painful disorder associated with joint disorder) (71.2%). Self-report of neck pain was present in 92.3% of these patients. Of these individuals, 7.7% had no neck disability, 67.3% had a mild disability, 17.3% had a moderate disability and, 7.7% had a severe disability. The mean CSI score was 46.12 ( $\pm 1.63$ ) e the mean for NDI score was 12.04 ( $\pm 0.92$ ). A strong and positive correlation was found between the CSI and NDI scores ( $\rho=0.71$ ;  $p=0.00$ ). One-way ANOVA showed that there is an effect of neck disability levels on the CSI score [ $F(3,48)=15.37$ ;  $p=0.00$ ]. The post-test showed that there is a difference in the average CSI score between all groups, except between the moderate and severe disability groups.

### Conclusion

There was a strong and positive correlation between the CSI and NDI scores, where higher NDI scores are related to higher CSI scores in individuals with TMD. Self-reported symptoms related to CS differed according to neck disability levels. However, this difference is not found between the moderate and severe disability groups.

**Keywords:** Temporomandibular Joint Dysfunction Syndrome, Central Nervous System Sensitization, Neck Disability