

論 文 要 旨

Effects of intra-esophageal acid infusion and a stress task on masseter muscle activity and autonomic nervous activity in wakefulness

覚醒時の咬筋活動と自律神経活動に対する

食道内酸注入とストレス課題の影響

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ABSTRACT

Background: Gastroesophageal reflux disease may be an important risk factor for awake bruxism. Additionally, it has been known that a psychological stress task affects masseter muscle activity, and autonomic nervous system (ANS) activity modulation induces masseter muscle activity.

Objectives: This study aimed to investigate whether task-induced stress and experimental esophageal acid infusion increase masseter muscle activity and alter ANS activity, compared to rest task and esophageal saline infusion, respectively.

Methods: Polygraphic monitoring, consisting of electromyography of the masseter muscle and electrocardiography was performed in 12 healthy adult men during 30-min interventions with intra-esophageal saline or acid infusion, while reading a book quietly, as rest, and while performing calculation, as a stress task.

Results: At rest, masseter muscle activity and parasympathetic nervous system (PNS) activity during acid infusion was significantly higher ($P=0.019$) and lower ($P=0.021$) than during saline infusion, respectively. During saline infusion, both masseter muscle activity and sympathetic nervous system (SNS) activity or PNS activity while performing the calculation task were higher ($P = 0.022$ and 0.012 , respectively) or lower ($P = 0.007$) than those during the reading task, respectively. In two-way repeated-measures ANOVA, intra-esophageal infusion (saline or acid) significantly affected masseter muscle activity ($P=0.008$) and PNS activity ($P=0.021$). However, performing tasks (reading or calculation) significantly affected only PNS activity ($P= 0.028$).

Conclusion: Intra-esophageal acid infusion significantly increased masseter muscle activity and decreased PNS activity. In contrast, stress task significantly decreased PNS activity, but only modestly increased masseter muscle activity and SNS activity.