Modulation of the stretch reflex of jaw-closing muscles in different modes and phases of respiration.

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The objective of this study was to investigate whether and how changes in the mode of respiration affect the electromyographic activity of human jaw-closing muscles. Fifteen men were examined in this study. A pair of surface electrodes was attached bilaterally to the masseter and anterior and posterior temporalis muscles for electromyographic recording. Respiratory movements of the chest wall and nasal airflow were recorded simultaneously. Recordings were performed with subjects in the sitting position during quiet nasal and oral respiration. The stretch reflex of jaw-closing muscles was elicited by randomly tapping the chin with an impulse hammer. In 11 subjects, we measured nasal resistance with a rhinomanometer. The amplitude of electromyographic activities of the masseter and anterior temporalis muscles during oral respiration was significantly less than that during nasal respiration, whereas that of the posterior temporalis muscle showed no significant difference between the different modes of respiration. Furthermore, the reduction in the amplitude of the electromyographic activity was more evident in the inspiratory phase during oral respiration. There was a significant positive correlation between the ratio of the reflex amplitude during inspiration in the 2 respiratory modes and nasal resistance for the masseter muscle, but not for the anterior temporalis muscle. These results suggest that the reflexive electromyographic activity of some human jaw-closing muscles is modulated during oral respiration.

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