

Effect of changes in the breathing mode and body position on tongue pressure with respiratory-related oscillations.

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The purpose of this study was to examine whether tongue pressure on the lingual surface of the mandibular incisors shows respiratory-related changes, with particular attention paid to its relationship to genioglossus electromyographic activity, and to determine the effect of changes in the mode of breathing and body position on tongue pressure. Tongue pressure was recorded with a miniature pressure sensor incorporated in a custom-made intraoral appliance in nine male subjects in different breathing modes and body positions. Electromyographic activity of the genioglossus muscle and respiratory-related movement were recorded simultaneously. Tongue pressure showed respiratory-related cyclic oscillations, with a maximum value during expiration and a minimum value during inspiration. In contrast, the activity of the genioglossus muscle showed a maximum amplitude during inspiration and a minimum amplitude during expiration. The maximum tongue pressure during oral breathing was significantly greater ($P < .01$) than during nasal breathing in both the upright and supine positions. Changes in body position significantly affected the maximum tongue pressure during oral breathing. The activity of the genioglossus muscle changed significantly with different breathing modes and body positions. Changes in the position of the hyoid bone produced by changes in the breathing mode and body position appear to have a critical role in determining tongue pressure.

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