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Effect of breathing, pressure and posture on palatoglossal and genioglossal tone.

[Mathur R](#), [Mortimore IL](#), [Jan MA](#), [Douglas NJ](#).

Department of Medicine, Royal Infirmary, Edinburgh, U.K.

1. Patency of the upper airway is critical to respiration. Although about half of patients with the sleep apnoea/hypopnoea syndrome obstruct their upper airway at the retropalatal level, the respiratory actions of the palatal muscles have been little studied. We have therefore tested the hypothesis that the nasopharyngeal dilator muscle palatoglossus is activated during inspiration and by negative pressure. 2. Using intramuscular wire electrodes inserted perorally, we have compared the response of palatoglossus and genioglossus to breathing, posture change and airway negative pressure in 10 normal awake subjects before and after topical anaesthesia. The results are expressed as a percentage of maximal electromyogram. Data were analysed by repeated-measures analysis of variance. 3. Inspiratory activity was exhibited by both genioglossus [inspiratory, 10% +/- 2% (SEM); expiratory, 6% +/- 1%, $P = 0.001$] and palatoglossus (inspiratory, 16% +/- 5%, expiratory, 10% +/- 3%, $P = 0.016$), but only genioglossus exhibited increased activity on lying (supine 10% +/- 2%, erect 6% +/- 1% maximum, $P = 0.01$). 4. One hundred milliseconds after negative pressure application, activity increased in both genioglossus (7% +/- 2% and 13% +/- 3% respectively, $P = 0.02$) and palatoglossus (8% +/- 2% and 23% +/- 6% respectively, $P < 0.001$). After lignocaine surface anaesthesia to the nose and pharynx both genioglossus and palatoglossus still increased their activity in response to negative upper airway pressure, the extent of the increase being decreased for palatoglossus ($P = 0.02$) but not for genioglossus. 5. Thus, palatoglossus has respiratory activity and is activated by negative upper airway pressure.

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