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Title: Anaesthesia of the upper airway reduces genioglossus but not tensor palatini muscle activity during quiet breathing

Dr. Jayne C. 17946 Carberry j.carberry@neura.edu.au ¹, Ms. Hanna 17947 Hanna hahensen@gmail.com ¹,
Dr. Julian P. 17948 Saboisky j.saboisky@neura.edu.au ¹, Ms. Lauren P. 17949 Fisher
l.fisher@neura.edu.au ¹, Prof. Jane E. 17950 Butler j.butler@neura.edu.au ¹, Prof. Simon C. 17951
Gandevia S.Gandevia@neura.edu.au MD ¹ and Dr. Danny J. 17956 Eckert d.eckert@neura.edu.au ¹. ¹
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Body: Background Pharyngeal dilator muscles are essential in maintaining airway patency. During sleep, ineffective dilator muscle activity may contribute to OSA. Understanding how these muscles are controlled is an important objective. Genioglossus (GG) and tensor palatini (TP) muscles have been shown to have similar short latency excitatory reflex responses to large negative pharyngeal pressure pulses (~-15cmH₂O). While diminishing mechanoreceptor input with lignocaine reduces GG activity during quiet breathing the effect on TP is unknown. Aim To determine the effect of lignocaine (to minimize mechanoreceptor input) on GG and TP dilator muscle activity during quiet breathing and upper-airway collapsibility. Methods Intramuscular wires were inserted into GG and TP to record EMG activity during quiet breathing before and after lignocaine in 11 individuals. Epiglottic and choanae pressures were measured during brief pulses of negative pressure (~-10cmH₂O) to determine upper airway collapsibility. Results Anaesthesia led to a significant fall in peak GG EMG activity (31.2±11.3 vs. 24.6±9.1 μV, p=0.04). In contrast, anaesthesia had no effect on peak TP EMG activity (13.8±2.4 vs. 13.6±1.8 μV, p=0.91). Upper airway collapsibility index increased post-lignocaine (23.1±5.1 vs. 40.5± 10.6 %, p=0.04). Conclusions Lignocaine increases upper airway collapsibility during wakefulness. In contrast to GG, TP receives minimal mechanoreceptor input via negative pressure during quiet breathing. Investigation into the effects of lignocaine on GG and TP reflex responses to larger negative pressure pulses remains ongoing. Supported by the National Health & Medical Research Council of Australia.