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Oral breathing increases Pth and vocal effort by superficial drying of vocal fold mucosa.

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Oral breathing superficially dehydrates the airway lumen by decreasing the depth of the sol layer in humans and animals. Conversely, nasal breathing can increase the humidity of inspired air. We compared the effects of short-term oral and nasal breathing on Pth and perceived vocal effort in 20 female subjects randomly assigned to two groups: oral breathing (N = 10, age 21-32 years); nasal breathing (N = 10, age 20-36 years). We hypothesized that short-term oral breathing, but not nasal breathing, would increase Pth, and that subjects would perceive this change as an increase in vocal effort. Following 15 minutes of oral breathing, Pth increased at comfortable and low pitch ($p < 0.01$) with 6 of 10 subjects reporting increased vocal effort. Nasal breathing reduced Pth at all three pitches ($p < 0.01$), and 7 of 10 subjects reported decreased vocal effort. Over all subjects, 49% of the variance in treatment-induced change in Pth was accounted for by change in vocal effort ($R = 0.70$). We posit that obligatory oral breathing places healthy subjects at risk for symptoms of increased vocal effort. The facilitatory role of superficial hydration on vocal fold oscillation should be considered in biomechanical models of phonation and in the clinical prevention of laryngeal dryness.

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