Not Just a Window Seat: Transcontinental Flight Induced Olfactory Window

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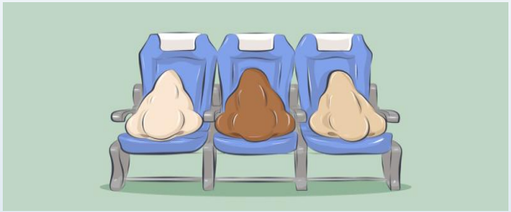
Introduction

Hummel, in normosmic volunteers, demonstrated that a decrease in atmospheric pressure reduced olfactory ability (Altundağ et al, 2014), whereas increase in atmospheric pressure enhanced olfactory ability (Kuehn et al, 2008). A similar effect of enhanced olfactory ability, associated with increased atmospheric pressure, in those with chemosensory dysfunction, has not heretofore been described. Such a case is presented.



Methods

A 60 year old right handed male with a 45 year history of type 1 diabetes mellitus, on an insulin pump with glulisine insulin, presented with eight years of gradually worsening sense of smell, culminating in complete anosmia. Four months prior to presentation, upon inhalation, he noticed phantosmia of sweet tobacco, which resolved with voluntary apnea. The phantosmic odor is level 8/10 in severity, involves both nostrils, lasts 10 seconds and occurs two times a day. He denied olfactory windows, dysosmia, palinosmia, cacosmia, and flavorful eructation. Coincident with his smell problems, he affirmed a decreased ability to taste over the last eight years. He can taste sweet, sour, salty, and spicy, but his overall ability to taste is only 10% of normal. He does admit to first bite phenomena, once a week, for one minute in duration. Immediately after disembarking from a transcontinental flight, while perambulating past a Starbucks, he experienced an olfactory window of coffee for approximately one minute. This resolved after he left the area in which the coffee shop was located, with no olfactory windows recurring since then.

Results

Abnormalities on Physical Examination: General: Bilateral palmar erythema. Bilateral 1+ pedal edema. Neurologic Examination: Mental Status Examination: memory testing: Immediate Recall: 6 digit forward and 4 backwards. Recent recall: 2 of 4 objects without improvement with reinforcement. Able to spell the word “world” forward but not backwards. Unable to interpret similarities. Cranial Nerve (CN) Examination: CN II: Fundoscopic Examination: vessels appear narrow with cotton wool spots OD. CN III, IV, VI: right ptosis. Motor: Drift: mild right pronator drift. Reflexes: 3+ brachioradialis and biceps bilaterally, absent ankle jerks. Chemosensory Testing: Olfaction: Dirhinous: Alcohol Sniff Test: 6 (anosmia). Brief Smell Identification Test: 8 (hyposmia). Pocket Smell Test: 1 (anosmia). Monorhinous: Phenylethyl Alcohol Snap and Sniff test: Left > -2.0, Right > -2.0 (anosmia). Olfactometer Identification Test: Left 6.00, Right 6.00 (anosmia). Retronasal Olfactory Testing: Retronasal Smell Index: 1 (abnormal). Gustation: Propylthiouracil Disc Taste Test: 9 (normogeusia). Neuropsychiatric Testing: Clock Drawing Test: 4 (normal). Animal Fluency: 20 (normal). Center for Neurologic Study Lability Scale: 8 (normal). Go-No-Go Test: 6/6 (normal). Other: CT scan with and without infusion: normal. Fiberoptic endoscopy: normal.

Discussion

There are myriad possible mechanisms for the olfactory window after a prolonged airplane ride. During flight, there was lower barometric pressure and humidity; thus after landing, there was a relative increase in humidity and pressure at the location of the Starbucks. The increase in humidity may have induced a greater water-odorant combination concentration, enhancing binding at the olfactory receptor sites. Such humidity-induced increase in atmospheric odorant saturation may have provided a greater substrate for the olfactory receptors (Kuehn et al, 2008). As per Boyle’s law, an increase in atmospheric pressure leads to a decrease in volume (Potter, 2001), therefore, there would be an increase in odorant molecules in the same space, which may act to increase the chance of binding to receptor sites. Alternatively, this may be due to the warm coffee vapors affecting the erectile tissue in the nose, and thus enhancing the amount of odorant that reaches the olfactory epithelium (Altundağ et al, 2014). This patient’s experience suggests that treatment with hyperbaric oxygenation may be worthy of consideration in those with smell loss.

References

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Disclosure Information

I have no financial relationships to disclose.

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