

Bluetooth Hyperosmia: Chemosensory Variant of Delusional Somatic Symptom Disorder: A Case Report

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Abstract

Objective: Correlation of Bluetooth transmission with subjective hyperosmia.

Background: Subjective hyperosmia, as a manifestation of belief of exposure to Bluetooth transmission, with testing demonstrating the absence of true hyperosmia, has not heretofore been described.

Case presentation: This 53-year-old right-handed single woman presented with a 10-year history of increased sensitivity to the aroma and enhanced perception of smells upon exposure to Wi-Fi electromagnetic radiation. She noted an intensity-duration effect: With higher intensity and duration of Wi-Fi exposure, her sense of smell would escalate and persist: After a few hours of exposure, her smell would jump to 190% of normal and last for two weeks.

Result: Abnormalities in the neurological examination: Reflexes: 0 in both lower extremities. Chemosensory Testing: Alcohol Sniff Test: 8 (hyposmia). Gustation: Waterless Empirical Taste Test: Brothy: 4/8 (hypogeusia).

Discussion: Nidus for such hyperosmic delusions may be a primary olfactory system disorder, with induction of ephaptic transmissions, causing intermittent phantosmia or otherwise misperceived odor, misattributed to the ambient environment. The assignment of the source of the hyperosmia to Bluetooth is consistent with the zeitgeist of mistrust and paranoia of higher technology. This may be a form of expectation effect due to visual evidence (high tower wires); suggestion combined with subcultural group dynamics with belief in harm of such electromagnetic/Bluetooth waves, with distorted information recall and misattribution. Such group dynamics and shared misperceptions may fuel a delusion, as in the Mandela effect. Perchance, this case represents not having delusional hyperosmia due to a functional psychiatric disorder but instead having a neuroanatomic basis. Those with subjective hyperosmia and hypersensitivity to aromas have demonstrated hypertrophied gray matter volume in the posterior sub-region of the right hippocampus, left precuneus, left superior frontal gyrus, and right hypothalamus. In those with subjective hyperosmia, a neurological investigation is warranted.

Keywords: Delusional disorder • Somatic symptom disorder • Hyperosmia • Phantosmia • Neuroanatomy

Background

Hyperosmia, or increased sense of smell, has been associated with various conditions, including cluster-like headaches, Addison's disease, benzodiazepine withdrawal, chemotherapy, duloxetine, methotrexate, levamisole, Coronavirus disease of 2019 (COVID-19) and first-trimester pregnancy [1-9]. In addition, many extreme neuropsychiatric phenomena have been reported attributed to exposure to a wide range of artificial physical agents, including microwaves, electromagnetic radiation, and fluorescent lighting. These have been attributed to ubiquitous allergies of obscure origin, multiple chemical sensitivity syndrome, or somatization disorder [10]. However, subjective hyperosmia, as a manifestation of belief of exposure to Bluetooth transmission, with testing demonstrating the absence of true physiological hyperosmia, has not heretofore been described. Such a case is presented.

Case Presentation

This 53-year-old right-handed single woman with a history of mold exposure presented with a 10-year history of increased sensitivity to the aroma and enhanced perception of smells upon exposure to Wi-Fi electromagnetic radiation. She noted an intensity-duration effect so that with higher intensity and duration of Wi-Fi exposure, her sense of smell would escalate to a greater degree and persist for a more extended period. For instance, after a few hours of exposure, her smell would jump to 190% of normal, and the enhanced ability to smell would last for as long as two weeks. While all aromas would intensify, those more prominent included fragrances, candles, gasoline, and grease. She has noted that as she drives toward a metropolitan area, she can feel that the Wi-Fi is more intense and gets an electrical sensation like "I am an antenna, sand is on my skin," "burning in my abdomen," "like a magnet is rubbing in my brain" and "spots before my eyes." Also associated with Wi-Fi exposure, her ears would get red and hot. Occasionally the above symptoms were not immediate but developed hours or days after the Wi-Fi exposure. These symptoms would reduce when she leaves areas of high Wi-Fi or takes a warm shower. Because of this, she refuses to use a cell phone or have Wi-Fi in her home. Coincident with increased perceived olfactory ability, there was no change in taste. Approximately one year before her presentation, she developed an Upper Respiratory Infection (URI) and since has been hyposmic, with all odors reduced to 60%-90% of normal, except with exposure to Wi-Fi, after which she becomes hyperosmic. Certain odors developed a distorted smell; for instance, chemicals smell, and processed foods, like chocolate and soda, would smell and taste like rotten meat. These distortions would not change, even upon Bluetooth exposure. Her taste had been reduced to 95% of average since the URI. She denied phantosmia, palinosmia, palinogeusia and phantageusia. The patient provided informed consent.

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Received: 31-May-2023, Manuscript No. jnd-23-103977; **Editor assigned:** 02-June-2023, PreQC No. P-103977 (PQ); **Reviewed:** 16-June-2023; QC No. Q-103977; **Revised:** 21-June-2023; Manuscript No. R-103977 (R); **Published:** 28-June-2023, DOI: 10.4172/2329-6895.11.3.554

Results

Abnormalities in the physical examination: General: Scalloped tongue. Mental Status Examination: Able to recall 3 out of 4 objects in 3 minutes without reinforcement and 4 out of 4 with reinforcement. She completed 10 years of education, and therefore proverbs were not tested. Cranial Nerve (CN) examination: CN II: Funduscopic examination: Peripapillary pigmentation OD. Gait examination: Antalgic. Reflexes: 2+brachioradialis, 2+biceps, 1+triceps, 0 in both lower extremities. Neuropsychiatric testing: Clock Drawing Test: 4 (average). Animal Fluency Test: 24 (regular). Go-No-Go Test: 6/6 (average). Center for Neurological Studies Liability Scale: 7 (Normal). The findings from the olfactory and gustatory chemosensory testing have been presented in Table 1.

Table 1: Chemosensory testing

Function	Chemosensory Test	Score
Olfaction	Brief Smell Identification Test	9 (normosmia)
	Alcohol Sniff Test	8 (hyposmia)
Gustation	Waterless Empirical Taste Test	
	Sweet	8/8 (normogeusia)
	Sour	7/8 (normogeusia)
	Salty	7/8 (normogeusia)
	Bitter	8/8 (normogeusia)
	Brothy	4/8 (hypogeusia)
	Total	46 (normogeusia)

Discussion

There are several explanations for the development of such delusional hyperosmia. Delusions are often based on preconceived notions of the noumenon. Odors are intrinsically intimate in that they enter the body through inhalation and thus are endowed with a mystical aura. This is demonstrated through the historical representation of aromas in religious ceremonies, ranging from the ancient Aztecs to the incense of modern religions [11]. Peradventure, the nidus for such hyperosmic delusions may be a primary olfactory system disorder, with induction of ephaptic transmissions, causing intermittent phantosmia or otherwise misperceived odor misattributed to the ambient environment. Such is analogous to that of delusions of crucifixion cenesthesia due to peripheral neuropathy in Marfan's syndrome, robotic Cotard delusions in acute drug-induced Parkinsonism, or xylogical variants of, reverse Fregoli syndrome in drug-induced Parkinsonism [12-14]. Thus, the complaint of hyperosmia may be considered a misattributed phantosmia. The subject experiencing such a phenomenon may be searching for a logical explanation for this phantom smell, which is then assigned to the ambient environment. This would be consistent with dysfunction of the right parietal lobe, which has been accorded the distinction of the censor of misconceived cognitive distortions from the left hemisphere [15,16]. Thus, this delusion may represent a sensory misperception due to distortion of the normal olfactory engram. If odors are perceived as a mixture of notes in chords, and some of those notes are reduced, others may appear more prominent. This condition could be perceived as hyperosmia because of loss of inhibition from inhibitory odorants. Paradoxically, such perceived hyperosmia may be due to specific or isolated hyposmia or anosmia, the olfactory equivalent to monochromatic colorblindness. The assignment of the source of the hyperosmia to Bluetooth or other radiation is consistent with the zeitgeist of mistrust and paranoia of higher technology. Thus, subjective hyperosmia would only occur when the patient perceives a kippage of radiation/Bluetooth/electromagnetic waves, independent of these being present. This may be a form of expectation

effect due to visual evidence (high tower wires); suggestion combined with subcultural group dynamics with belief in harm of such electromagnetic/Bluetooth waves, with distorted information recall and misattribution. Such group dynamics and shared misperceptions may act to fuel such a delusion, as in the Mandela effect [17]. This delusion may further be cemented based on perceived external influence and lack of control of such invisible intrusions, which would magnify any paranoia, contributing to the delusion. Perchance, this case represents not having delusional hyperosmia due to a functional psychiatric disorder but instead having a neuroanatomic basis. Those with subjective hyperosmia and hypersensitivity to aromas have demonstrated hypertrophied grey matter volume in the posterior sub-region of the right hippocampus, left precuneus, left superior frontal gyrus, and right hypothalamus [18]. Neuroimaging studies in the current case may be revealing. The development of red ears in this patient is consistent with Red Ear Syndrome or Autonomic Dysregulation Syndrome associated with migraine headaches, which may have been generated due to sympathetic hyper autonomic discharges associated with anxiety of perceived exposure [19].

Conclusion

This case may not be related to delusional hyperosmia linked to functional psychiatric conditions. Alternatively, there is a possibility of a neuroanatomic cause, which involves increasing gray matter volume in specific brain regions, such as the posterior subregion of the right hippocampus, left precuneus, left superior frontal gyrus, and right hypothalamus. Given the tenacious nature of such delusions, associated with resistance to consideration of their psychodynamic basis, treatment with agents which may be justified for use on both a psychological and chemosensory basis (e.g., antipsychotics) may be worthwhile.

Funding

Not Applicable.

Acknowledgement

Not Applicable.

Conflict of Interest

The authors declare that they have no competing interests.

Consent for Publication

Written informed consent was obtained from the patient to publish this case report.

Author Contributions

SK analyzed and interpreted the patient's results regarding subjective hyperosmia. NM summarized the existing literature. AH made substantial contributions to interpreting the neuroanatomical basis of the delusional disorder. All authors read and approved the final manuscript.

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How to cite this article: Kalita, S, Mehdiratta N and Hirsch AR. "Bluetooth Hyperosmia: Chemosensory Variant of Delusional Somatic Symptom Disorder: A Case Report." *J Neurol Disord.* 11 (2023):554.