To Sleep Perchance to Dream-not, Nyctophobia from COVID-19 Induced Hyposmia: A Case Report

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Abstract

Background: Increase awareness of the correlation between nyctophobia and hyposmia in individuals with COVID-19. Fear of sleep (nyctophobia) has been attributed to various conditions ranging from benign nocturnal panic attacks and Morvan's syndrome. Positional dependent hyposmia as an origin of nyctophobia has not heretofore been described.

Case presentation: This 52-year-old woman presented with sudden onset of loss of smell and taste with COVID-19, which returned to 85% of normal. However, her symptoms worsened when she would lie down to 30% of normal but would improve with standing, moving, and sitting. Requiring her to stand for hours before her sense of smell would return led to her nyctophobia that forced her to move around all the time.

Conclusion: Nyctophobia, a fear of positional dependent loss of smell, highlights the importance of smell to a narcissistic perception of self. This can be understood that the olfactory lobe is anatomically part of the limbic system. Deposition of memory engrams is facilitated as manifest with olfactory evoked nostalgia seen in 84% of the general population. The importance of smell is thus intrinsic to an individual's well-being, and the threat of loss of such sensation with a change in position with sleep was the precipitating event leading to nyctophobia in this subject. Assessing for fear of loss of smell in those with nyctophobia, especially with past COVID-19 infection, allows for an increased understanding of etiology and indicates potential treatment approaches.

Keywords: Case report • COVID-19 • Infectious diseases • Chemosensory dysfunction • Somatic disorder

Background

Fear of sleep, yclept nyctophobia, has been attributed to conditions ranging from benign nocturnal panic attacks and fear of unfamiliar surroundings to fatal familial insomnia and Morvan's syndrome [1,2]. Positional-dependent hyposmia is when an individual experiences a decrease in their sense of smell depending on their head or body position, which has been attributed to nasal structural abnormalities, respiratory conditions, or neurological disorders.

The fear of sleep, coupled with positional-dependent hyposmia, can intensify these sleep disruptions, induce significant emotional distress, lead to anticipation of negative experiences during sleep, heightened stress level, increased perception of vulnerability, and therefore develop hypervigilance. Recognizing and addressing these intertwined conditions is crucial for providing comprehensive care and improving quality of life. Positional-dependent hyposmia as an origin of nyctophobia has not heretofore been described. Therefore, such a case is presented.

Case Presentation

This 52-year-old right-handed woman was nasute until two years prior to presentation when she developed cold symptoms and sudden onset of loss of smell and taste, with a positive Reverse Transcription-Polymerase Chain Reaction test for COVID-19. Over three weeks, her smell and taste gradually returned to 85% of normal. However, she could not smell the aroma of bleach or cut grass. Five months before the presentation, she developed nasal congestion after exposure to a family member with COVID-19. Her smell and taste dropped to 20%-50% of normal such that Windex had no smell and turkey, and red meat had no taste. Over the next two months, her smell and taste gradually improved but varied daily. On presentation, she described her variation in smell as such that on her best days, it would be as high as 85%, and on worst days, it would drop down to 40% of normal. She reported that her smell and taste would remarkably worsen when lying down, to 30% of normal, but would improve with standing, moving, and sitting. Even reclining for a short nap would cause her sense of smell to drop, requiring her to stand for hours before her smell would recover. This caused her to fear to sleep and forced her to move around constantly. She markedly altered her lifestyle because of her fear of sleeping and assiduously avoided lying down: when so overwhelmed by tiredness that she must sleep, she would sleep sitting up. Before her chemosensory problems, she slept well without fearing lying down or sleeping. The patient provided informed consent.

Results and Discussion

Abnormalities in the physical examination

General: 2^+ Bilateral pedal edema. Bilateral palmar erythema.

Psychiatric examination: ***Speech:*** Coherent, relevant without circumstantiality, with average pace and volume.

Mood: Normal. The patient admits to panic attacks with overwhelming anxiety that make her feel dizzy and her heart racing, and she might do something crazy. She denies compulsions or forced acts. There are no recurrent or uncontrollable thoughts or obsessions. She denies feelings of unreality, depersonalization, persecution, ideas of influence, reference, delusions, or hallucinations. She denies deja vu and never seen.

Thought processes: Normal without circumstantiality: Oriented x 3, able to remember seven digits forward and five backward. Able to recall 3/4 of objects without reinforcement.

Presidents: Biden, Trump, Obama, Bush, Clinton, Reagan.? Able to spell the word "world" forwards and backward.

Interpretation of similarities: Usual.

Proverbs: Normal.

Calculation: Normal.

Abnormalities in neurologic examination:

Cranial Nerve (CN) examination: CN II

Fundoscopic examination: Peripapillary pigmentation OS.

CN III, IV, and VI: Right ptosis.

Neuropsychiatric testing: *Clock drawing test:* 4/4 (average).

Animal fluency test: 22 (regular).

Go-no-go test: 6/6 (average).

Chemosensory testing

The comprehensive chemosensory evaluation involved standardized tests to assess the patient's olfactory and gustatory capabilities, as Tables 1 and 2 outlined. The observed deficits in olfactory function, specifically abnormality in the perceived odor intensity and anosmic to alcohol odor. Regarding gustatory function, the diminished sensitivity to brothy tastes was noted. A board-certified neurologist administered the tests in a controlled environment.

Table 1: Standardized tests to assess the patient's olfactory capabilities.

Tests for olfaction	Score and exposition
Brief smell identification test	9 (normosmia)
Alcohol sniff test	3 (anosmia)
Suprathreshold amyl acetate odor intensity test	normosomia
Suprathreshold amyl acetate odor hedonic test	Crossed pattern (abnormal)
Dirhinus amyl acetate odor threshold test	-7.0 (hyperosmia)
Retronasal index	8 (normosmia)

Table 2: Standardized tests to assess the patient's gustatory capabilities.

Tests for gustation	Score and exposition
Phenylthiocarbamide disc taste test	10 (normogeusia)
Waterless empirical taste test	-
Sweet	7 (normogeusia)
Sour	6 (normogeusia)
Salty	6 (normogeusia)
Bitter	8 (normogeusia)
Brothy	4 (hypogeusia)
Total	39 (normogeusia)

Nyctophobia, due to fear of positional dependent loss of smell, highlights the importance of smell to the narcissistic perception of self. More than just one of the senses, olfaction is vital for mood regulation, memories, and quality of life. Associated with chemosensory dysfunction is psychiatric dysfunction, including a 96% incidence of DSM-III R Axis I or II diagnoses. The most common Axis I diagnoses are generalized anxiety disorder and dysthymia [3]. This high incidence of comorbidity between chemosensory and psychiatric dysfunction can be understood given that the olfactory lobe is anatomically part of the limbic system or emotional brain [4]. Smell facilitates socialization and maintaining interrelationships; sexual dysfunctioning is seen in 17% with olfactory loss [5]. Deposition of memory engrams is facilitated as manifest with olfactory evoked nostalgia seen in 84% of patients [6]. Finally, quality of life is reduced in 68% of patients who demonstrate smell loss [7].

Conclusion

The importance of smell is thus intrinsic to an individual's well-being, and the threat of losing such sensation with a change in position with sleep was a nidus for this case's nyctophobia. Thus, the fear of persistent smell loss associated with lying down is a motivating factor inducing nyctophobia in this patient. Assessing for fear of loss of smell in those with nyctophobia, especially with past COVID-19 infection, allows for an increased understanding of etiology and indicates potential treatment approaches.

Declarations

Ethics approval and consent to participate

The patient provided informed consent.

Consent for publication

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

Availability of data and material

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

SK analyzed and interpreted the patient's results regarding positional dependent hyposmia as an origin of nyctophobia. DB summarized the existing literature. RC and NM significantly contributed to the manuscript's drafting. AH made substantial contributions to interpreting the neuroanatomical association between chemosensory and psychiatric dysfunction. All authors read and approved the final manuscript.

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