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Leading Article

The photic sneeze

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Sneezing once or twice in response to bright light has been observed and described by several authors in the last four decades.[1-5] Sedan observed that people sneezed in response to the beam of his ophthalmoscope. He described 6 cases of sneezing in response to ophthalmoscope light, sun, photographic flash and Wood's ultraviolet light.[2] Sneezing occurred at the beginning of exposure of the retina to bright light, but did not persist with continued exposure or repetition.[2] The light stimulant usually follows a period of relative darkness producing a refractory stage leading to further photic sneeze.[2] Certain individuals deliberately look up at the sun for the pleasure of sneezing.[3] Sometimes the eyes may water, together with a sensation of tickling in the nose, but without causing sneezing.[2] Frequently, a number of such cases are found within the same family.[1-4,6] The data support the dominant mode of transmission of the inherited photic sneeze.[6,7] Results of research undertaken in the USA, Sweden and Britain pointed to a mean percentage of 25% of the general white population in support of this.[5-8]

All the above mentioned authors noted the problem of lack of awareness of the photic sneeze as a major difficulty in these epidemiological studies. Subjects who sneezed in response to bright light replied that they had not paid attention to it, assuming that all people reacted thus, while those who did not sneeze at bright light replied that they did not know that such a reaction existed. The second difficulty which is closely related to the lack of awareness lies in the degree of intelligence of the segment of the population under study. Highly intelligent individuals show a higher incidence.[6] In the light of these comments, incidence of self-recognized photic sneezing in Caucasians and Blacks is much lower.[4-7] Unrelated to the intelligence scale, the percentage of photic sneeze is significantly lower in white females than in white males.[6]

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Watson, a century ago, was the first to state that photic sneeze reflex occurs most frequently when there is a morbid sensitivity of those parts innervated by the fifth cranial nerves. One example of this is catarrhal affections of the conjunctiva in scrofulous children, especially in the case of scrofulous keratitis. The photophobia in these cases is due to morbid hyperaesthesia of the ciliary branches of the fifth nerve centrally reflected to the retina.[9] It is possible that the significantly higher nasal obstruction incidence due to low resistance to seasonal colds in white students when compared with coloured students, may play a role in the high self-reported prevalence of photic sneeze in white students.[5-7]

Irritation of the eye by light via the optic nerve evokes the protective reflexes of the nose, among them sneezing. The photic sneeze reflex is a common phenomenon present in early life between 4 weeks and 33 months, with an autosomal dominant inheritance.[5,8,10] The mechanism of sneezing in response to bright light is poorly documented. One hypothesis suggests that bright light impinges on the eyes giving rise to lacrimation and that when tears reach the lacrimal puncta sneezing occurs. The short latency period and the fact that even if interruption prevents the tears from reaching the lacrimal puncta, sneezing still ensues, shows that lacrimation is not causal.[7] Another hypothesis suggests that the visuo-sneezing link is located in the medulla oblongata.[5] Visual information within the brainstem is, however, predominantly concerned with the rapid processes of eye movement and not with the gradual prelude to sneezing.[11]

A tempting hypothesis of optic-trigeminal summation was suggested by Everett.[6] This concept explained photophobia as being caused by visual afferents stimulating the trigeminal system and the parasympathetic system. This is analagous to the parasympathetic generalization by which the stimulation of one parasympathetic branch leads to its spread, such as the association between urination, shivering and lacrimation. Similarly, light, in addition to producing miosis (cranial nerve III), may also stimulate the intermedius and produce nasal engorgement (VII) and sneezing (V, IX, X, XI, XII).[6] Eckardt, who studied the mechanism of

photophobia, concluded that there is a considerable association between the optic and fifth nerves, especially in the mesencephalon. This association, he felt, results in the phenomenon of referred pain whereby stimulating one of the cranial nerves enhances the irritability of the others.[12] Possibly, optic stimulation may produce referred sensation, not only in the parts innervated by the first division of the trigeminal nerve, as in photophobia, but also in parts such as the nose, innervated by the first and second division. Hence, strong light might enhance nasal sensations to the point of precipitating sneezing.[5]

The protective reflexes of the eyes show considerable overlap with those of the nose. Keratitis has been reported to enhance the photic sneeze reflex.[2,9,12] Conversely, nasal irritations may evoke blinking and lacrimation, reactions known respectively as the nasopalpebral and nasolacrimal reflexes.[13] Incorrectly fitting glasses affect oculomotor nerves outflow and consequently gastric motility.[1,6,14] Parasympathetic generalization may be encountered in reactions such as lacrimation, blepharospasm, photophobia, asthma and gastric motility.[1,6,14]

References

1. Shilkret, H.H. Psychogenic sneezing and yawning. *Psychosom Med* 1951, **13:** 56–58.
2. Sedan, J. Photosternutatory reflex. *Rev Otoneuroophtalmol* 1954, **26:** 123–126.
3. Birch, C.A. Sneezing. *Practitioner* 1959, **182:** 122–124.
4. Adler, F.H. *Physiology of the Eye*, 3rd edition. C.V. Mosby, St Louis, 1959, pp. 25–26, pp. 79–80.
5. Beckman, L. & Nordenson, I. Individual differences with respect to the sneezing reflex: an inherited physiological trait in man? *Hum Hered* 1983, **33:** 390–391.
6. Everett, H.C. Sneezing in response to light. *Neurology* 1964, **114:** 483–490.
7. Forrester, J.M. Sneezing on exposure to bright light as an inherited response. *Hum Hered* 1985, **35:** 113–114.
8. Peroutka, S.J. & Peroutka, L.A. Autosomal dominant transmission of the 'photic sneeze reflex'. *N Engl J Med* 1984, **310:** 599–600.
9. Watson, W.C. *Diseases of the Nose and its Accessory Cavities*. Lewis, London, 1875, pp. 343–344.
10. Lovatt Evans, C. *Principles of Human Physiology*, 11th edition. J. & A. Churchill, London, 1952, p. 330.
11. Jung, R. Central visual information. *Handbook of Sensory Physiology*. Springer Verlag, Berlin, 1973, vii, 3:98.
12. Eckardt, L.B., McLean, J.M. & Godel, H. The genesis of pain from the eye. *Ass Res Nerv Ment Dis* 1943, **23:** 209–227.
13. Schapero, M., Cline, D. & Hofstetter, H.W. *Dictionary of Visual Science*, 1st edition. Chilton, Philadelphia, New York, 1960, p. 589.
14. Holmes, T., Goodel, H., Wolf, S. & Wolf, H. *The Nose*. Charles C. Thomas, Springfield, Ill., 1950, p. 4, p. 14, p. 52.

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