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Sneezy Twins

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A curious monozygous pair of twins producing sudden and vehement nose blowing and/or sneezing during/after eating and drinking, when their stomach had achieved a certain stage of fullness, has been observed. The sneezing reflex could be registered in 4 male members of the family. Since there were neither neurological disorders nor significant alterations in their electroencephalographic activity, the phenomenon may be regarded as a special type of hereditary vegetative sensitivity. The trait seems to follow either an autosomal dominant or perhaps a Y-linked mode of inheritance.

Sneezing and coughing function as reflexes integrated by the medulla oblongata. They are set into action by different triggers acting on the respiratory epithelium and serve to eliminate noxious agents from the respiratory tract. Twenty years ago Everett [2] reported on sneezing reaction initiated by bright light and called it photic sneeze reflex; it could be elicited in 23% of the medical students of Johns Hopkins University. Recently, Peroutka and Peroutka [8] have given account of a family in which three males and one female reacted by sneezing if exposed to strong light. Beckman and Nordensen [1] obtained results similar to those of Everett in that the sneezer trait was observed in 24% of blood donors of Umeå, Sweden. On the basis of their family study they suggested that the trait might be inherited in an autosomal dominant fashion.

One of the present authors (G. F.), accomplishing a comprehensive twin study, found a twin pair among the participants whose sneezing reflex could be provoked in a different way.

Report of Cases

The members of a male twin pair introduced themselves as the "Sneezy twins". At that time they were 50 years old.

The phenomenon was observed in 4 male subjects belonging to three generations of their family (Fig. 1). The familial feature had been observed in the twins' father since his youth. The twins R. B. and G. B. are constantly watched by their colleagues with whom they have lunch. When the colleagues enter the common lunch room where the twins have already reached a certain stage of saturation, their repeated sneezing

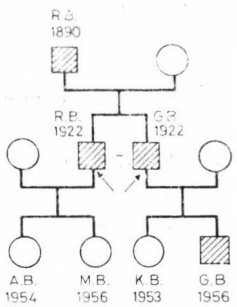

FIG. 1

is taken as an indicator of a good and abundant meal. The sneezing reflex of the twins is provoked by a full stomach.

The sneezing attack also appeared at puberty in a further male member of the third generation. None of the females of three generations were affected.

The diagnosis of zygosity of the twins was based mainly on various blood group and protein system determinations (AB0, Mn, Rh, Hp and Gm) [9], and some other anthropogenetic traits [3, 4, 5, 6, 7]. Based on these investigations, they were considered monozygous.

The twins were similar in physical appearance, although one of them (R. B.) weighed ten kg less than the other. This could be attributed to his allergy to milk, milk products, strawberries, raspberries and to different environmental factors. Both were right-handed and showed an R type of hand clasping and an L type of arm folding. Both were strong cigarette smokers. Both were tasters for phenylthiocarbamide and smellers for acetone and methylethylketone. Both of them performed a positive curling of the tongue. Their index numbers, after having drunk a standardized beetroot juice, were almost identical (0.090 and 0.114).

Neurological findings. G. B. had no neurological complaints. R. B. often had a headache. Brain nerve functions were normal in both. Deep reflexes were slightly intensified, especially in R. B. They both had mild hyperhidrosis of the palms. Movements, sense functions and coordination were intact. A tremometric examination, using a piezoelectric accelerometer, revealed no resting tremor but some degree of postural hand tremor could be registered in both. Visuomotor reaction time was corresponding to age.

In order to obtain a controlled repetition of their strange characteristic, the twins were examined at the University Neurological Department. Electroencephalography was performed at two occasions. During spontaneous registration, compression of the carotid sinus on both sides, bilateral bulbus compression and the Valsalva test were performed, then they were invited to smell amyl nitrate. Thereafter they were asked to

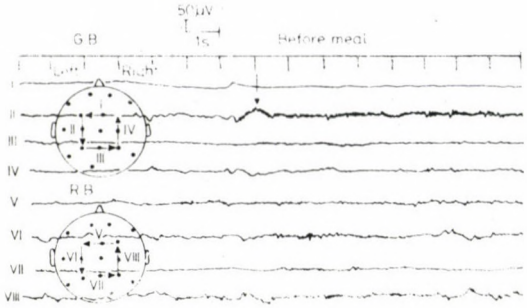

FIG. 2

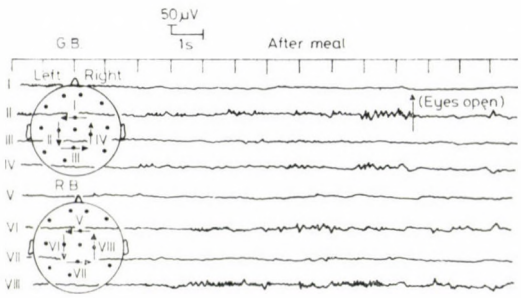

FIG. 3

consume Amolet biscuits and water; this combination leads to strong gastric and intestinal distension. These types of loading of mainly vegetative character did not activate sneezing in either of the twins. Simultaneously with exteroceptive stimulation of the vagus and trigeminus nerves a desynchronization in the EEG could be observed, related to an increase in the number of α-waves in background activity. Since the aphysiological distension of the stomach did not provoke sneezing, the twins were given an abundant lunch and electroencephalographic records were continuously taken before, during and after the meal (Figs 2 and 3). In the moment when a sensation of gastric fullness was achieved, a sudden and vehement nasal secretion and nose-blowing lasting for some minutes appeared in both persons simultaneously. The EEG, however, remained normal. No appreciable alterations in cortical electric activity were evoked by the sneezing reflex.

As described above, the phenomenon was observed in 4 male members of three generations of the family, including a monozygous pair of twins. The family tree suggests a dominant inheritance either autosomal or Y-linked. The latter would be an extreme rarity but its possibility cannot be discarded.

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