

- 8 Sørensen TIA, Sonne-Holm S. Intelligence test performance in obesity in relation to educational attainment and parental social class. *J Biosoc Sci* 1985;17:379-87.
- 9 Lew EA. New data on underweight and overweight persons. *J Am Diet Assoc* 1961;38:323-7.
- 10 Sonne-Holm S, Sørensen TIA. Post-war course of the prevalence of extreme overweight among Danish young men. *J Chronic Dis* 1977;30:351-8.
- 11 Christensen U, Sonne-Holm S, Sørensen TIA. Constant body mass index in Danish young men in 1943-1977. *Hum Biol* 1981;53:403-10.
- 12 Svalastoga K. *Prestige, class and mobility*. Copenhagen: Gyldendal, 1959.
- 13 Teasdale TA. Social class correlations among adoptees and their biological and adoptive parents. *Behav Genet* 1979;9:103-14.
- 14 Rasch G. *Probabilistic models for some intelligence and attainment tests*. Chicago: University of Chicago Press, 1980.
- 15 Witkin HA, Mednick SA, Schulzinger F, et al. Criminality in XYY and XXY men. *Science* 1976;193:547-55.
- 16 Teasdale TW, Owen DR. Heredity and familial environment in intelligence and educational level—a sibling study. *Nature* 1984;309:620-2.
- 17 Walker SH, Duncan DB. Estimation of the probability of an event as a function of several independent variables. *Biometrika* 1967;54:167-79.

- 18 Bishop Y, Fienberg S, Holland P. *Discrete multivariate analysis*. Cambridge, Massachusetts: MIT Press, 1975.
- 19 Garn SM, Bailey SM, Cole PE, Higgins ITT. Level of education, level of income, and level of fatness in adults. *Am J Clin Nutr* 1977;30:721-5.
- 20 Kohrs MB, Wang LL, Eklund D, Paulsen B, O'Neal R. The association of obesity with socioeconomic factors in Missouri. *Am J Clin Nutr* 1979;32:2120-8.
- 21 Wadden TA, Stunkard AJ. Adverse social and psychological consequences of obesity. *Ann Intern Med* 1985;103:1062-7.
- 22 Weiss E. Perceived self-infliction and evaluation of obese and handicapped persons. *Percept Mot Skills* 1980;50:1268.
- 23 Canning H, Mayer J. Obesity—its possible effect on college acceptance abilities. *N Engl J Med* 1966;275:1172-4.
- 24 Monello LF, Mayer J. Obese adolescent girls. An unrecognized "minority" group? *Am J Clin Nutr* 1983;13:35-9.
- 25 DeJong W. The stigma of obesity: the consequences of naive assumptions concerning the causes of physical deviance. *J Health Soc Behav* 1980;21:75-87.

(Accepted 10 December 1985)

SHORT REPORTS

Rhythmic raiding of refrigerator related to rapid eye movement sleep

We report on a patient who three to five times each night got out of bed and went to the adjacent kitchen to eat and drink, and correlate these episodes of eating with periods of rapid eye movement sleep.

Case report

A man aged 37 in a managerial job was concerned about the fact that he raided his refrigerator to eat and drink three to five times each night, about every one and a half hours.

When aged 1 he had received operations for epispadias, and his ureters had been implanted into the bowel. He first married at 23 years, but when the marriage broke down soon after his weight fell to 55 kg. During the next few years he had an active sex life, and his nocturnal eating began. He remarried at 29 years to a woman with a keen interest in cooking. His wife was unperturbed by his nocturnal activities and generally slept through them. If she spoke as he got out of bed he would only mutter back, and she did not think that he was properly awake as often in the morning he would not remember having got up during the night. After each episode of eating he would rapidly fall back to sleep. Sometimes he would switch on the kitchen light, and sometimes he would behave oddly—for example, he had once found himself drinking sunflower oil. Asked why he did not simply restrain himself and stay in bed, he said that it was "a sort of impulsion." When he and his wife went to France each summer for a month they would place food and drink beside his bed every night.

During the past 12 years he had regularly taken cycloserine to prevent urinary tract infections. He had also been told to drink plentifully. His nocturnal behaviour did not seem to have the characteristics of sleepwalking, but as sleepwalking can be provoked by drugs acting on the central nervous system the cycloserine treatment was suspected. Treatment with trimethoprim instead of cycloserine had no effect on his nocturnal behaviour. Generally, he was healthy, but his blood urea was 9.6 mmol/l (85 mg/100 ml) and he had mild renal scarring. His height was 172 cm, and his weight improved steadily when he started to live with his second wife, becoming stable at about 70 kg for the past several years. There was no history of abnormal daytime eating habits or any unusual concern for his body size. His hobbies were mainly sedentary.

He spent six nights in the sleep laboratory and would put beside his bed two bottles of soft drink, a pork pie, several packets of potato crisps, and biscuits. He fell asleep quickly and slept on average for 439 minutes with a normal distribution of sleep stages, including 25% rapid eye movement (paradoxical) sleep. There were 31 episodes of eating, counting closely grouped eating episodes as one; 28 of these occurred just before, in the middle of, or just after a period of rapid eye movement sleep (figure). An electroencephalogram confirmed brief wakefulness as each eating and drinking episode began, and a video tape showed him unscrewing and screwing up bottle tops. While chewing, however, he would be falling asleep and would pass into stage 2 sleep within a few seconds and rapid eye movement sleep within half a minute.



Episodes of eating and drinking in relation to rapid eye movement sleep during the night (measured in the sleep laboratory). Hatched areas are periods of rapid eye movement sleep; lines are episodes of eating.

The patient and his wife agreed that when they next went on holiday they would not have any food by the bedside. On return he claimed to have had only soft drinks during the night. His nocturnal eating returned, however, and at follow up at one year he was again raiding the refrigerator every hour and a half during the night. He now dismissed it cheerfully, saying that it did not affect him adversely.

Comment

In their early description of periods of rapid eye movement in the sleep of babies on demand feeding, Aserinsky and Kleitman reported that demands for food were related in time to rapid eye movement sleep.¹ In adults there is a 100 minute rhythm in waking behaviour, as is the case with periods of rapid eye movement during sleep, and, in an unstructured environment, waking adults tend to eat and drink spontaneously every 100 minutes.^{2,3}

In conclusion, our patient exhibited a normal propensity for rhythmic eating and drinking but was unusual in not suppressing this at night as most adults do.

- 1 Aserinsky, E, Kleitman N. A motility cycle in sleeping infants as manifested by ocular and gross bodily activity. *J Appl Physiol* 1955;8:11-8.
- 2 Friedman S, Fisher C. On the presence of a rhythmic, diurnal, oral instinctual drive cycle in man. *J Am Psychoanal Assoc* 1967;15:317-43.
- 3 Oswald I, Merrington J, Lewis L. Cyclical "on demand" oral intake by adults. *Nature* 1970;225:959-60.

(Accepted 8 November 1985)

University Department of Psychiatry, Royal Edinburgh Hospital, Edinburgh EH10 5HF

IAN OSWALD, MD, FRCPSYCH, professor of psychiatry
KIRSTINE ADAM, PHD, research fellow

Correspondence to: Professor Oswald.

Cyanosis attributable to right to left shunt in the carcinoid syndrome

Cyanosis is commonly observed in the carcinoid syndrome and thought usually to be due to haemostasis in dilated capillaries.¹ We present a case in which central cyanosis appeared to be secondary to a pronounced right to left shunt.

Case report

A 69 year old woman presented with weight loss, diarrhoea, ankle swelling, and exertional dyspnoea of six months' duration. She had previously been fit, was a non-smoker, and was not taking any drugs. On examination she was thin, centrally cyanosed (but not clubbed), and breathless on minimal exertion. She had sinus tachycardia (100 beats/min), a soft ejection systolic murmur at the upper left sternal edge, and moderate ankle oedema. Jugulovenous pressure was not raised. There were no signs of chronic liver disease, and the liver was not palpable. A firm mass the size of a golfball was felt in the right iliac fossa.