

Nocturnal activity and enuresis

A study of a 35 year old male

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SYNOPSIS A significant relationship between nocturnal enuresis and motility is demonstrated in a 35 year old male patient who had chronic nocturnal enuresis. After further treatment this relationship disappeared and the enuresis progressively diminished.

Chronic 'simple' nocturnal enuresis is commonplace especially in the prepubertal male. It is often said that such enuretic subjects sleep 'deeply' and without movement. This may contrast with their daytime hyperactivity. There are several reports in the literature concerning the relationship of electroencephalographic (EEG) sleep to such episodes of nocturnal enuresis, in small groups of subjects. Most workers (Ditman and Blinn, 1955; Bental, 1961; Schiff, 1965) conclude that enuretics tend to fall into one of two groups: those, mostly children, who are enuretic in the stages of deep EEG sleep and those, mostly from the less common adult group, who are enuretic in a state of wakefulness or near wakefulness which Kiloh *et al.* (1972) have likened to a state of dissociation. However, Ritvo and his colleagues (1969), studying seven prepubertal boys, report that all showed a variety of associations, with enuresis sometimes occurring in deep EEG sleep and sometimes occurring in light sleep with evidence of clear arousal within 60 seconds of the act of micturition.

CASE REPORT

A 35 year old male, a professional engineer, was admitted to the psychiatric inpatient unit for further investigation after unsuccessful treatment for his secondary 'simple' nocturnal enuresis by a variety of pharmacological and mechanical means, over several years. Before admission he was again examined physically and no significant abnormalities

were found, this confirming the results of previous clinical, laboratory, and radiological investigations.

Dry from 18 months, his enuresis had started immediately after separation, aged 3 years and 11 months, from his elder sister for the first time when he was evacuated from London in the early part of the second world war. His reaction to this separation had been to develop a seemingly catatonic or stuporose-like state lasting three days, which was diagnosed at the time as rheumatic fever but which left no cardiac sequelae. Since then he had been enuretic five nights in seven on average with a mean volume of about 300 ml. His father had also been enuretic until his own engagement to be married at the age of 18 years.

The second oldest of four now adult siblings, of whom three (one educationally subnormal but none enuretic) still lived at home, the patient had never developed any significant relationships outside his immediate family and had never lived away from his mother. He denied any sexual contacts, blaming the enuresis for his reluctance, and admitted no sexual fantasies at any stage, but had a heterosexual orientation.

An over-active child, he had always slept very heavily and said that he never dreamed.

Treatment comprised intensive group and individual psychotherapy aimed at reducing his almost complete denial of emotional feeling and expression. The effects of amitriptyline and amylobarbitone were also examined. At intervals throughout the 12 week inpatient study nocturnal activity was measured by means of a motility bed designed to record nocturnal movements, the bed being standardized for the subject's weight (Crisp *et al.*, 1970; Stonehill and Crisp, 1972).

The occurrence of bed wetting was recorded by a modified blanket and bell apparatus, designed so

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TABLE 1
RELATIONSHIP BETWEEN ENURESIS AND MOVEMENT

Night	Units motility	Dry/wet (ml)
2	9	200
3	5	< 100
4	18	Dry
5	14	Dry
6	21	Dry
7	6	400
8	4	100
9	10	Dry
10	13	Dry
11	10	Dry
12	8	Dry
13	2	200
14	4	300

that its operation did not cause discomfort or disturbance to the patient. The urine volume on each enuretic occasion was estimated by the patient in the morning (he had become skilled at doing this accurately) and reported to the staff.

TABLE 2
RELATIONSHIP BETWEEN ENURESIS AND MOVEMENT AFTER AMITRIPTYLINE

Night	Units motility	Dry/wet (ml)
37	102	Dry
38	63	Dry
39	64	Dry
40	43	Dry
41	23	Dry
42	15	200
43	5	300
44	40	Dry
45	30	Dry
46	32	500
47	40	Dry
48	8	300
49	2	Dry
50	1	50

In the first instance nocturnal motility was investigated for the first 13 nights after the first admission night. A clear relationship existed (Table 1) between recorded movement and whether or not enuresis occurred ($r = -0.71$, $P < 0.001$, Kendall's Tau)—that is, enuresis was associated with lack of recorded movement in bed. The tendency, over this relatively brief period of study, for his estimated urine volume on wet nights to be inversely related to his nocturnal motility does not reach statistically significant levels.

Subsequently, psychotherapy was started at the

level of three 50 minute individual sessions and two 50 minute group sessions per week together with occasional interviews with the patient and his mother. The frequency of enuresis—that is, approximately 50% of nights—remained unchanged.

After two weeks, amitriptyline 25 mg three times daily was added to the treatment programme because of the reported value of tricyclic drugs in some cases of nocturnal enuresis and despite the fact that he had been treated unsuccessfully, for a long period before with imipramine. Thereafter, the patient was dry for 11 successive nights, the longest run of consecutive dry nights ever. After the sixth of these nights he was again investigated on the motility bed for the next 14 nights (Table 2). At the outset nocturnal motility was greatly increased in comparison with that recorded during the previous two week study. Subsequently, as it diminished, nocturnal enuresis recurred and was once again related, within the context of continued overall diminishing activity by night, with relative nocturnal inactivity ($r =$

TABLE 3
RELATIONSHIP BETWEEN ENURESIS AND MOVEMENT AFTER CESSATION OF AMITRIPTYLINE

Night	Units motility	Dry/wet (ml)
60	139	200
61	155	Dry
62	174	Dry
63	175	200
64	166	Dry
65	177	Dry
66	222	200
67	224	Dry
74	223	Dry
75	127	Dry
76	137	200
77	119	Dry
78	107	200
79	188	250
80	67	200
81	180	200

-0.41 , $P < 0.025$, Kendall's Tau, with sequential effect partialled out). Also during this period of increased motility the patient for the first time found that he was able to recall and report dreams, and the sexual content of these together with that of daytime fantasies that he was reporting for the first time was used within the ongoing psychotherapy.

After one more week the patient was again investigated on the motility bed. At the end of this period the amitriptyline was stopped. After a further week he was again studied on the motility bed for a

final eight nights. During these final two periods of study the patient continued to have nocturnal enuresis on approximately 50% of nights. Now, however, his nocturnal activity was greatly increased at all times and bore no relationship to the enuresis (Table 3). Moreover, he was now beginning to waken sometimes at night (a new event in his life) and on some of these occasions he had a desire to micturate and got up to do so.

After discharge from hospital he left home almost immediately and moved into a hostel where he has now been for 14 months. During this time, although he has made no significant relationships outside his family, he has become less dependent on them and occupies himself fully with his work as a surveyor and his hobby of photography. He continues to recall dreams and wake up regularly at night. His enuresis pattern has steadily changed, the volume having fallen to a mean of about 100 ml and the frequency to a mean of about three nights in 14.

COMMENT

Before treatment this adult patient showed a significant relationship between his nocturnal enuresis and his nocturnal movement. Nocturnal movement is generally related to depth of sleep as measured both by nurses' observations (Samuel, 1964) and sleep EEG (Loomis *et al.*, 1937; Blake *et al.*, 1939; Coleman *et al.*, 1959; Oswald *et al.*, 1963). However, in individual instances, and to take an extreme case, it is possible to lie awake for many hours and not move (Crisp and Stonehill, 1971) and it may well be that the state of dissociation, allied with wakefulness and suggested by Kiloh *et al.* (1972) as being characteristic of adult nocturnal enuresis, is also associated with lack of nocturnal bodily movement. Within this context, it may be noteworthy that our patient's secondary enuresis started at the age of nearly 4 years, a time when he was probably in such a state of dissociation for several consecutive days and nights.

Nocturnal motility therefore requires to be considered as a possible relatively independent factor in nocturnal enuresis. It is noteworthy that the so-called bell and blanket method of treating nocturnal enuresis sometimes involves the insertion of substantial wire meshes into the bed which are then likely to have a major effect upon the nocturnal motility of the subject lying on them. The proposition that this factor makes

a significant contribution to the effect of such treatment is currently being investigated.

It is also noteworthy that this subject's nocturnal activity was considerably increased in the first instance after the administration of amitriptyline, a drug well known to affect both daytime mood and activity levels as well as sleep patterns. As far as the latter is concerned, the effect is usually to prolong the time spent asleep and to reduce rapid eye movement sleep. The subsequent diminution in the patient's nocturnal activity during this period may reflect habituation to the drug. Subsequently, when the drug had been stopped and when important psychological changes seemingly stemming from the psychotherapy were occurring, the patient's nocturnal motility increased considerably and became associated with periodic nocturnal wakefulness, increased dream recall, and the appearance of daytime sexual fantasies. Nocturnal enuresis did not immediately diminish but has done so subsequently.

It is suggested that the combined treatment in this case allowed the patient a greater awareness of impulses indicating full bladder during sleep. In addition to contributing to these changes the psychotherapy helped the patient to leave home, and it is likely that the subsequent improvement is partly due to this.

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REFERENCES

- Bental, E. (1961). Dissociation of behavioural and electroencephalographic sleep in two brothers with enuresis nocturna. *Journal of Psychosomatic Research*, **5**, 116-119.
- Blake, H., Gerard, R. W., and Kleitman, N. (1939). Factors influencing brain potentials during sleep. *Journal of Neurophysiology*, **2**, 48-60.
- Crisp, A. H., and Stonehill, E. (1971). Aspects of the relationship between psychiatric status, sleep, nocturnal motility and nutrition. *Journal of Psychosomatic Research*, **15**, 501-509.
- Crisp, A. H., Stonehill, E., and Eversden, I. D. (1970). The design of a motility bed including its calibration for the subject's weight. *Medical and Biological Engineering*, **8**, 455-463.
- Ditman, K. S., and Blinn, K. A. (1955). Sleep levels in enuresis. *American Journal of Psychiatry*, **111**, 913-920.
- Kiloh, L. G., McComas, A. J., and Osselson, J. W. (1972). *Clinical Electroencephalography*, 3rd edn., pp. 170-171. Butterworths: London.

- Loomis, A. L., Harvey, E. N., and Hobart, G. A., III (1937). Cerebral states during sleep, as studied by human brain potentials. *Journal of Experimental Psychology*, **21**, 127-144.
- Oswald, I., Berger, R. J., Jaramillo, R. A., Keddie, K. M. G., Olley, P. C., and Plunkett, G. B. (1963). Melancholia and barbiturates: a controlled EEG, body and eye movement study of sleep. *British Journal of Psychiatry*, **109**, 66-78.
- Ritvo, E. R., Ornitz, E. M., Gottlieb, F., Poussaint, A. F., Maron, B. J., Ditman, K. S., and Blinn, K. A. (1969). Arousal and nonarousal enuretic events. *American Journal of Psychiatry*, **126**, 77-84.
- Samuel, J. G. (1964). Sleep disturbance in depressed patients: objective and subjective measures. *British Journal of Psychiatry*, **110**, 711-719.
- Schiff, S. K. (1965). The EEG, eye movements and dreaming in adult enuresis. *Journal of Nervous and Mental Disease*, **140**, 397-404.
- Stonehill, E., and Crisp, A. H. (1971). Problems in the measurement of sleep with particular reference to the development of a motility bed. *Journal of Psychosomatic Research*, **15**, 495-499.



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