Insomnia in psychiatric illness

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MOST recent sleep research has utilized electroencephalographic measurement of sleep which provides the most reliable indicator of the depth and duration of sleep. Indeed, most of this afternoon's papers which are concerned with the measurement of sleep use EEG measurement. The present paper is, however, devoted to reports of sleep. Although the individual's report of his sleep may not tally with the EEG measurement and may therefore be regarded as inaccurate, it is nevertheless fundamental as a reflection of his personal experience. Furthermore, in clinical practice, most information is imparted by report and is therefore particularly important in influencing clinical judgment. For example, the complaint of early morning waking by a depressed patient is an important factor predicting a good response to ECT (Carney, Roth and Garside, 1965) in spite of the fact that the EEG may reveal that the sleep is disturbed throughout the night.

Sleep disturbance is a common feature in psychiatric illness most frequently in the form of insomnia, but occasionally in the form of hypersomnia. Gross reduction of sleep is often evident in psychotic states characterized by great arousal and excitement such as mania and acute schizophrenia. Detre (1966) reported sleep disturbance to be present in about 70% of 295 newly admitted psychiatric patients with a variety of diagnoses, and Ward (1968) reported a similar figure. He investigated 87 consecutive female psychiatric admissions and found that two-thirds complained of insomnia.

Insomnia is usually classified according to the time of night at which the sleep disturbance is most evident. Thus, the terms 'initial insomnia' and 'early morning waking' are commonly used. Hinton (1962) has said that although there is some support for this traditional division, the distinction is by no means clear-cut but it is justifiable to distinguish a group who have obtained more sleep in the first half of the night from those who sleep more in the second half of the night. Within psychiatric illness, insomnia has usually been regarded as being most evident in disorders of mood (Mayer-Gross, Slater and Roth, 1969). Kiloh and Garside (1963) found sleep disturbance to be an important factor, distinguishing

patients diagnosed as suffering from endogenous depression from those diagnosed as suffering from neurotic depression. Those with endogenous depression complained of early morning waking while those with neurotic depression showed initial insomnia. Mayer-Gross *et al.* (1969), writing of endogenous depression, state that 'disturbance of sleep is the most important of the bodily symptoms. The patients may have difficulty in getting to sleep, but *most typically wake early*, or several times during the night...'. They contrast this with neurotic depression in which they state 'sleep is commonly disturbed, and may be interrupted by unpleasant dreams. But *a particular tendency to waking early in the morning is unusual...*'. Many experimental studies (Rosenthal and Gudeman, 1967; Hamilton and White, 1959; Rosenthal and Klerman, 1966; Haider, 1968) have supported the association of early morning waking with endogenous depression.

McConaghy, Joffe and Murphy (1967) were critical of the methodology of Kiloh and Garside (1963), and their replication of this latter study did not support the evidence in favour of the independent existence of neurotic and endogenous depression. Other studies have also failed to distinguish between sleep patterns in endogenous and neurotic depression. These include the questionnaire study of Costello and Selby (1965) and a study by Hinton (1963) in which sleep was assessed by self report and nurses' observations as well as measurements of nocturnal motility. Evidence from continuous all-night electroencephalographic recordings in endogenous depression suggests that wakefulness recurs throughout the night (Oswald *et al.*, 1963; Diaz-Guerrero, Gottlieb and Knott, 1946). Furthermore, in an EEG study of twenty-one patients with a variety of types of depression, Hawkins and Mendels (1966) failed to distinguish patterns of sleep disturbance differentiating these types. In comparison with a control group of thirteen subjects, they found that depressed patients were characterized by delay in sleep onset, decreased total amount of sleep, frequent waking throughout the night and earlier time of final waking. The greatest amount of wakefulness occurred during the last third of the night. They suggested

that the pattern of sleep disturbance is more likely to be related to the severity of the depression rather than to its specific type.

It is probable that depressed patients are more likely than most others to present insomnia, and particularly early morning waking, as a complaint because of the unpleasant effect associated with wakefulness, especially in the early part of the day, in patients who have a diurnal mood swing. This is not the case in anorexia nervosa for although early morning waking is also a common clinical feature, it is rarely presented as a complaint by the patient whose main preoccupation is to lose weight. Indeed, she may welcome wakefulness as an opportunity to take exercise and so further her aim of weight loss. A study by Samuel (1964) supports the notion of a relationship between complaint and effect in depression. He used patients' self reports, nurses' observations and nocturnal motility as measures of sleep in eighteen depressed patients over twelve nights each. On six nights the patients were given thioridazine 50 mg and on the other six nights a placebo. The active drug did not affect motility scores, although patients rated sleep more optimistically on the tranquillizer. However, the nurses were not able to distinguish between the drug and placebo in terms of duration of sleep. There was a correlation between patients' and nurses' ratings of sleep with motility scores. Samuel concluded that the drug made patients feel happier and this is reflected in their more optimistic ratings of sleep.

In spite of the widely held view that the maximal degree of sleep disturbance in psychiatric illness occurs in association with the affective disorders, there is still evidence that insomnia, including early morning waking, is a more general feature of psychiatric illness. Kupfer, Detre and Harrow (1967), in a study of ninety-nine consecutive psychiatric hospital admissions, reported an association between an increase in symptoms and early morning waking, irrespective of diagnosis, but no association between an increase in symptoms and initial insomnia. McGhie (1966) obtained data on sleep patterns by giving a questionnaire to 400 consecutive psychiatric hospital admissions. He found that the in-patient group slept less well than a normal population from a previous study (McGhie and Russell, 1962) (Figure 1).

Figure 2 shows that 25% of the in-patient group, as compared with 8% of the normal population, reported sleeping for 5 hr or less. The Figure also shows that the reduction of sleep in psychiatric illness is compounded of initial insomnia, early waking and interrupted sleep, as well as complaints of lightness of sleep and morning tiredness.

Figure 3 shows that the greatest prevalence of maximal sleep disturbance was in the neurotic,

FIG. 1. Distribution of total sleep period in normal population and psychiatric inpatients (McGhie, 1966. Reproduced by kind permission of the Editor, *British Journal of Medical Psychology*). □, Normal group; ▨, patient group.

FIG. 2. Comparison of psychiatric inpatients and normal subjects in terms of a variety of reported sleep characteristics. All differences significant at 1% level (McGhie, 1966. Reproduced by kind permission of the Editor, *British Journal of Medical Psychology*). □, Normal group; ▨, patient group.

psychopathic and alcoholic groups and not in the depressive groups. The organic, paranoid and schizophrenic groups have the least prevalence of maximal sleep disturbance.

Figure 4 compares the depressive group with the non-depressive group. The prevalence of sleeping for 5 hr or less was similar in the two groups. Indeed, the two groups are not statistically significantly different in any of the sleep items except morning tiredness. In particular, it is noteworthy that the prevalence of early morning waking was not different in the two groups.

A more detailed questionnaire given to thirty depressed patients revealed that five of the six in this

FIG. 3. Overall sleep disturbance reported by psychiatric patients in relation to diagnostic categories (McGhie, 1966. Reproduced by kind permission of the Editor, *British Journal of Medical Psychology*). ▨, Minimal disturbance; □, medium; ▩, maximal.

FIG. 4. Comparison of self-reported sleep characteristics of depressed and non-depressed psychiatric inpatients. *Difference significant at 5% level; others not significant (McGhie, 1966. Reproduced by kind permission of the Editor, *British Journal of Medical Psychology*). ▨, Depressive group; □, non-depressive group.

group who had early morning waking suffered from agitation and restlessness. This latter observation supports the finding of Hinton (1963) wherein clinical, observable agitation was strongly associated with a greater loss of sleep in the latter part of the night.

Crisp and Stonehill have examined the association between sleep patterns and mood as well as psychiatric diagnoses in a population of 375 new referrals to a psychiatric outpatient clinic. This is part of a larger study which has also measured nutritional status (Stonehill, 1972; Crisp and Stonehill, 1973a). Questionnaires to be completed by the patients and also on the basis of interviews were administered to seek information about the patient's sleep, weight and

mood. The patients were then seen for a diagnostic interview by an independent consultant psychiatrist who completed a questionnaire providing a diagnostic profile together with other details of the patient's mental state. The population spanned a wide range of psychiatric diagnoses with a preponderance of neurotic patients and those with personality disorders.

Table 1 displays the distribution of the patients' self-rating of mood before the illness and the weeks before attending the clinic. The overall population is characterized by feeling more nervous, angry, sad, tense, fidgety, restless and irritable but less euphoric and excited in the last few weeks compared with before the illness. Within the total population, the average duration of sleep before the illness was 7.25 hr and this differs little from the average duration of sleep reported in the general population. The average duration of sleep during the illness was just over 6.75 hr and this is nearly 30 min less than before the illness ($P < 0.005$). The reduction of sleep during the illness was caused by taking longer to fall asleep and an increase in the duration of broken sleep. There was no difference in the time of going to bed or the time of waking up in the morning.

Patients did not discriminate enough between different disturbed moods to enable examination of sleep patterns in relation to 'pure' mood states. Therefore a group who reported very disturbed mood during the illness was compared with a group who reported less disturbed mood in respect of reported sleep. The very disturbed mood group had less total sleep (6 hr 28 min) than the less disturbed group (7 hr 1 min) ($P < 0.02$). The disturbed group was characterized by taking 24 min longer to fall

TABLE 1. Distribution of self-ratings by mood by 375 consecutive new psychiatric outpatients

Feeling	Before illness				Last few weeks			
	Not at all	Slightly	Quite a bit	Very	Not at all	Slightly	Quite a bit	Very
Nervous	78	169	82	46	26	67	130	152
Angry	167	137	55	16	104	113	93	64
Euphoric	120	119	102	32	245	82	36	11
Excited	125	113	109	27	187	96	59	33
Sad	124	134	71	45	43	95	111	126
Tense	69	128	96	80	16	49	115	194
Fidgety and restless	94	136	86	59	48	63	126	136
Irritable	97	148	85	44	47	90	118	120

asleep ($P < 0.02$) and having 9 min more interrupted sleep ($P < 0.02$) than the less disturbed group. Time of going to bed and time of waking were not different in the two groups. Consultants, however, discriminated sufficiently in their ratings of mood to enable us to examine sleep characteristics in relation to the discrete mood states *angry*, *anxious*, *sad* and *tense*. Only patients who were rated as having the presence of not more than one of these moods were included. Within some of these categories numbers were small and the variance of sleep items tended to be large. However, it is considered worthwhile to mention some of the trends. The least average amount of total sleep occurred in the *angry* group and was just over 6 hr—this is nearly 1 hr less than in the *tense* and *anxious* group, in which it was nearly 7 hr. The *sad* group slept on average for about 6½ hr. The *tense* group went to bed latest, at nearly midnight, whereas the *sad* and *anxious* groups went to bed nearly 1 hr earlier. Initial insomnia was greatest in the *anxious* group and least in the *tense* group. The duration of broken sleep was greatest in the *angry* group and least in the *tense* group. The average time of waking was earliest in the *sad* group and latest in the *anxious* group. Thus, overall, the mood of *anger* is characterized by the greatest amount of sleep disturbance occurring throughout the night, *anxious* mood by initial insomnia, broken sleep but delayed waking in the morning, *sadness* by going to bed early with some delayed onset of sleep but, strikingly, with early waking, and *tension* by going to bed late but falling asleep relatively quickly.

Within the affective disorders this study provided us with an opportunity to make a comparison of the sleep patterns of the three diagnostic categories often thought to be characterized by distinctive sleep disturbance, namely, anxiety state, endogenous depression and neurotic depression. This report concerns those patients who were diagnosed as having not more than one of these three diagnoses, thereby providing three groups each with a 'pure' diagnosis. Thus, those patients who were, for example, regarded as displaying features of both

endogenous depression and neurotic depression were excluded. Forty-four patients were diagnosed as suffering exclusively from anxiety state, twenty-one from endogenous depression and sixty-two from neurotic depression.

Figure 5 displays the average duration of sleep in the three diagnoses. This was similar in anxiety state and endogenous depression, being 7 hr 7 min and 7 hr 8 min respectively. This is somewhat longer than the average duration of sleep in the total population which was 6 hr 52 min. The average duration of sleep in neurotic depression was 6 hr 18 min and this is significantly less than in the total population ($P < 0.01$) and also significantly less than in endogenous depression or anxiety state ($P < 0.05$). Thus the greatest amount of overall sleep disturbance is evident in neurotic depression. Patients with endogenous depression also reported going to bed earlier

FIG. 5. Reported average duration of sleep in anxiety state (A), endogenous depression (E) and neurotic depression (N).

(11.00 p.m.) than patients with anxiety state (11.26 p.m.) and neurotic depression (11.28 p.m.), but these differences do not reach statistical significance.

Figure 6 shows the average length of time taken to fall asleep in the three diagnoses. Patients with endogenous depression fell asleep after 30 min on average, and this is less ($P < 0.05$) than the time

FIG. 6. Reported average time taken to fall asleep in anxiety state (A), endogenous depression (E) and neurotic depression (N).

which occurred early within the 24 hr cycle, the patients going to bed early, falling asleep quickly with a small amount of interrupted sleep but with early waking. Anxiety state also was not characterized by short sleep duration but, in contrast to endogenous depression, by a sleep period which occurred late in the 24-hr cycle and was further characterized by delayed onset of sleep and late waking. Finally, early waking is not a feature which distinguished endogenous depression from neurotic

FIG. 7. Reported average time of waking in anxiety state (A), endogenous depression (E) and neurotic depression (N).

taken to fall asleep in the anxiety state and in neurotic depression, in which it was 47 min and 58 min respectively. On average, patients with endogenous depression reported falling asleep at 11.41 p.m., whereas patients with anxiety state and neurotic depression fell asleep at 12.12 a.m. and 12.27 a.m. respectively. The average amount of broken sleep in endogenous depression was 14 min, and this is less than in anxiety state and neurotic depression in which it was 20 min and 23 min respectively. This difference does not reach statistical significance.

Finally, Fig. 7 displays the average time of waking in the three diagnoses. This was similar in endogenous depression and neurotic depression, being 7.03 a.m. and 7.08 a.m. respectively. However, the average time of waking in anxiety state was significantly later, being 7.42 a.m. ($P < 0.05$).

Thus, within the three diagnostic categories, the least average duration of sleep was present in neurotic depression. This is contributed to by delay in falling asleep, interrupted sleep and early waking. Endogenous depression was not characterized by a short total duration of sleep but by a sleep period

depression but it did distinguish both these syndromes from anxiety state.

In 1967, Crisp reported his observation that sleep disturbance, particularly in the second half of the night, is a common feature of anorexia nervosa and this had been confirmed in further systemic studies (Crisp, Stonehill and Fenton, 1971; Crisp and Stonehill, 1971; Lacey *et al.*, 1975). It was suggested that the sleep disturbance was linked to the disturbed nutritional state and that such a relationship may also exist in other populations including a general psychiatric population in which weight change may co-exist.

The study of Carney *et al.* (1965) reported the clustering of certain symptoms in depression reflecting the usual concepts of endogenous and neurotic depression. Weight loss as well as early morning waking was an important component of the endogenous cluster and indeed there was a statistically significant correlation ($r = 0.234$) between these two items. Several other studies (Kiloh and Garside, 1963; Beck, 1967) report the co-existence of weight loss and early morning waking in depression but

none of these studies has suggested a causal link between these two items but, by inference, has regarded them as being integral aspects of an underlying biological factor which also promotes the disturbed mood. The outpatient study referred to before, and reported in detail elsewhere (Stonehill, 1972; Crisp and Stonehill, 1973a) included the measurement of some aspects of nutritional status as well as sleep and psychiatric state, and set out to explore possible links between nutrition and sleep in a general psychiatric population. It is only possible here to summarize a few of the main findings. About a third of the population reported major weight change (4.5 kg or more) since the start of the illness, and this was fairly evenly divided between those who reported weight gain and those who reported weight loss. An analysis of principal components revealed a link in three of the first ten components between change in weight and change in sleep, independent of mood state or psychiatric diagnosis (Stonehill and Crisp, 1973). Two of these components showed an association between weight loss and decreased sleep and the third between weight gain and increased sleep. Subsequently, the formation and analysis of a series of 2×2 contingency tables enabled us to explore various aspects of the possible links between weight and sleep in the areas of depression and anxiety as well as the state of sadness. Overall there was a striking association between weight loss and duration of sleep of 6.5 hr or less, as well as between weight gain and duration of sleep of 7.5 hr or more. The link between weight change and duration of sleep was mainly contributed to by an association of weight loss and waking early (before 6.30 a.m.) and between weight gain and waking later (after 7.30 a.m.). In some instances there was an association

between broken sleep and weight loss as well as the absence of broken sleep and weight gain, but in no instance was there an association between weight change and time of falling asleep. These relationships spanned the diagnoses and mood states explored but there was some evidence that they were strongest in states of depression and sadness (Crisp and Stonehill, 1973b).

It may be concluded that insomnia is a common feature of psychiatric illness. It is likely that patients with depression, more than most others, may present early morning waking as a complaint because of their distress on waking. Within the affective disorders, although early morning waking is often a feature of endogenous depression, evidence has been presented that this condition is not characterized by reports of severely reduced sleep but by reports of the occurrence of the sleep period early within the 24-hr cycle. Similarly, anxiety state is also not characterized by reduced sleep but by the occurrence of the sleep period late within the 24-hr cycle. Neurotic depression is characterized by the greatest amount of sleep disturbance, contributed to by delay in falling asleep and early morning waking. Finally, it is suggested (Fig. 8) that there are two general factors which can contribute to disturbed sleep in a variety of psychiatric conditions. The first is the factor of subjective appreciation of disturbed mood, and contributes to sleep disturbance in the first part of the night. Patients who report very disturbed mood have delay in falling asleep. This factor does not affect time of waking and indeed, if allowed to, these patients may sleep late. The second factor is a nutritional component and contributes to sleep disturbance in the second half of the night. Patients who report weight loss during the illness also report early waking in

FIG. 8. The differential effect of self-reported disturbed mood and weight loss on sleep in psychiatric patients.

contrast to those with weight gain who report later waking. Changes in weight do not affect time of falling asleep.

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