ulcer and acute gastritis, the amount of free and total acid was 20-40 degrees higher than before.

In patients with alcoholic gastritis the iodine test had no effect.

The results obtained after the injection of iodine were similar to those obtained after the histamine test.

Therefore it would be better to replace histamine by iodine in testing for gastric function.

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HYPERSOMNIA SYNDROMES

BY

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During recent years there has been a tendency to describe syndromes in which somnolence or hypersomnia has been associated with other symptoms. Some have reported cases of periodic somnolence and morbid hunger (Kleine, 1925; Lewis, 1926; Levin, 1929, 1936, 1938; Kaplinsky and Schulmann, 1935; Critchley and Hoffman, 1942; Ronald, 1946), and a few have described patients suffering from hypersomnia at menstrual periods (Kleine, 1925; Lhermitte and Kyriaco, 1929; Lhermitte, 1942; Lhermitte, Hécaen, and Bineau, 1943). Episodic states of sleep have also been reported by workers at the Frankfurt Clinic (Grosch, 1943). It has been claimed that all these syndromes exist as definite entities.

Clinical Material

In a survey of 2,169 in-patients treated by me in E.M.S. neurosis hospitals during the period 1940-8 there were cases of nearly every kind of psychiatric illness, including a wide variety of sleep disturbances (Pai, 1946b). The present paper is based on a study of 67 male patients who complained either of diurnal somnolence or of hypersomnia. Somnolence is here used to mean drowsiness during which a person is partially aware of what is happening around him. Hypersomnia is a condition in which daily more hours are spent in sleep than in wakefulness. Cases of narcolepsy have been excluded from this study. The ages of these patients ranged from 18 to 27, with an average of 22.6 years. The methods of obtaining social histories and independent factual evidence and of assessing personality have been discussed elsewhere (Pai, 1944, 1945, 1946a).

The Wassermann test was done as a routine, and special investigations such as the fractional test meal, x-ray examination, and electroencephalography were carried out in

appropriate cases. The staff had strict instructions not to give more than the authorized scale of rations, and individual requests from patients for extra food were ignored.

Clinical investigations consisted chiefly in testing the plantar reflex at intervals and in noting the presence or absence of vocal and motor activities (a) during the period of apparent sleep, (b) during apparent sleep induced by hypnosis, and (c) during narcosis produced by giving intravenously a 10% solution of a barbiturate such as "sodium amytal." The object of these procedures was partly to estimate the approximate duration of physiological sleep and the time spent in the transitional stages between full wakefulness and sleep, and partly to determine which physical signs gave the most reliable indications of sleep.

It was ascertained that the period of so-called sleep consisted of phases of physiological sleep interspersed with waves of partial sleep. Vocal and motor activities were either absent or infrequent during spells of sleep and were more frequent during the intervals of partial sleep. The average time spent in sleep was roughly about four and a half to five hours (Pai, 1949).

Psychiatric Findings

Personality studies and psychiatric investigations revealed that the majority of these patients were immature and inadequate personalities who had previously reacted to stress by producing psychogenic symptoms. In some men the sleep-wakefulness pattern was disturbed by a combination of unforeseen circumstances over which they had no control.

In each and every case psychological and environmental causes were found to be responsible for the symptoms, which were precipitated by lack of suitable employment, by uncongenial jobs, or by boredom. Excessive sleep and abnormal appetite when found in the same patient were due to two entirely different factors, and both symptoms were manifestations of neurosis.

This was perhaps well illustrated by some of the ex-prisoners of war. These men had spent long periods in camps in Germany, Italy, or the Far East. On repatriation they were given permission to draw extra rations and were also granted accumulated leave varying from three to four or more months. During furlough they ate a lot and naturally slept a good deal. There was thus a primary disturbance of the sleep-wakefulness cycle, and quantitative non-pathological hypersomnia became a daily habit.

On the expiry of their leave, instead of being released from the Forces as they had fondly hoped, they were asked to report for duty. They alleged that at the holding battalion headquarters they were made to do drills on the square; and that some of their instructors were young non-commissioned officers who had only a few months' service. The drill bored them and they resented being "ordered about" by young N.C.O.s who had never seen any active warfare. These were some of the psychological factors which helped to maintain the excessive sleep pattern.

The ordinary Army rations given to them at the holding battalion seemed to them inadequate by comparison with the double rations to which they had got accustomed while on furlough. Not all these men could easily adjust themselves to this sudden reduction in diet. Some complained of feeling "always hungry."

Laboratory Findings.—In not a single patient was there any sign of hyperchlorhydria. X-ray investigations showed no evidence of gastro-intestinal hypermotility. Stools were also examined for occult blood and amoebic cysts. Some of the clinical and experimental observations made on these patients are described in the following case history, which is well worth recording because of several unusual features.

Case Report

A young man aged 20 was referred for investigation and treatment, his complaints being excessive sleep and difficulty in waking up in the mornings, occasional headaches, and pains in the stomach, groins, and legs.

History of Present Illness.—According to official documents his symptoms started sixteen months earlier, while convalescing from an attack of pneumonia complicated by femoral thrombosis. Several specialists had examined him, and in some hospitals he had been "thoroughly investigated, with negative results." He had no desire to leave the Army, and a Medical Board, having found it undesirable to discharge him until he was fit for civilian work, had placed him temporarily in Category C (for home service and light duties only). This was found difficult to carry out. His own doctor and the officers of his unit had convinced themselves that he had genuine difficulty in getting up in the mornings. These officers reported that it was almost impossible to rouse him, and they testified that various methods had been tried without effect—namely, "cold water on face, opening eyelids, shining a torch on pupils, pulling, slapping, pinching, and shaking; but none of these seemed to disturb him. In fact, all the usual methods have been tried and all have failed." In reply to my special inquiries the officer commanding his unit stated that his conduct and reliability were excellent while awake, but that "the average time he was awake during any 24 hours was less than six hours. From close observation we are convinced that his case is completely genuine."

On admission he was found to be fairly intelligent, and was genuinely worried about his condition. He denied any other causes for worry, as he was quite contented in his unit. He was slim but well nourished, with asymmetry of the chest, gynaecomastia, and fine tremor of outstretched hands. He had prominent veins on the abdominal wall and varicose veins in the legs.

Laboratory Investigations.—Wassermann reaction, negative. Urine, nothing abnormal. Radiograph of skull and chest, N.A.D. Blood-sugar levels and basal metabolic rates were within normal limits. Electroencephalogram: "Abnormal in that the alpha rhythm of 8-10 c./sec. was less well developed and had a lower voltage from the left occipital region, suggesting an abnormality in one hemisphere. It was also deeply modulated and not completely inhibited by stimuli. There were some 6-c./sec. waves, and overbreathing increased their number for a short time." Fractional test meal, N.A.D.

Observations.—It was noticed that at about 7.30 p.m. daily he felt the onset of irresistible drowsiness, and on retiring to bed fell asleep almost instantly. He had difficulty in waking up in the morning, and slept uninterruptedly in spite of the noise (radio, etc.) until about 2.30 p.m., when he awoke of his own accord and complained of feeling hungry. When awake he was bright and lively.

Clinical Investigations.—While he was "asleep" the pupillary reflex, the knee-jerks, and the plantar reflexes were tested at half-hourly intervals and body movements were observed. His sleep was punctuated by spells when the plantar reflex was extensor or doubtfully so; for the remainder of the period of sleep it was definitely flexor. It was roughly estimated that in any eighteen hours of "sleep" he was actually asleep for approximately four and a half to five hours only; for about ten to twelve hours he was in a state of partial sleep closely similar to hypnotic trance. This was confirmed by inducing (when awake) hypnotic sleep, when to all appearances he was

fast asleep and could not be roused by the nurses. During this entire phase the plantar reflex was definitely flexor. Under hypnosis the psychological factors were discovered and he was successfully treated.

Results.—During the third week of his stay he woke up in the mornings without any help, worked hard in the workshop, and also took part in team games. In spite of several physical endurance tests he showed no inclination to sleep longer than about eight hours.

Follow-up.—Two years after discharge he was examined by a neurologist, who reported that he was in good physical health although nervous, and that there was no evidence of encephalitis. He has had no sleep trouble for five years.

Discussion

From this study it is obvious that somnolence and hypersomnia without any other evidence of increased intracranial pressure or of endocrine disturbance may be hysterical symptoms. Some of the previous case reports are incomplete, lacking in essential details, and distorted in significance. The term "somnolence" has also been used as a synonym for hypersomnia, and conclusions have been drawn on very inadequate factual evidence. In all the histories there is evidence that the patients were probably suffering from neurosis and that hypersomnia and "morbid hunger" were hysterical manifestations.

Levin's (1936) Case 6 is stated to have "talked and laughed in his sleep." Case 7 had attacks of retrograde amnesia. He was an inadequate and dependent personality who was over-protected by a fussy mother. Case 8 was a mental defective who was also a chronic bed-wetter. That the symptoms of the cases reported by Critchley and Hoffman (1942) were also psychogenic is obvious because (Case 1) "his first attack began . . . when he was working at a rather uncongenial job on radio research."

As regards "morbid hunger," the adjectives abnormal, excessive, ravenous, and so on have been freely used by different authors to describe the subjective experiences of the patients. This is not objective evidence of "hyperchlorhydria and hypermotility of the gut" as stated by Levin. None of the authors has reported the actual quantities of food consumed by the patients or the results of fractional test meals. Critchley and Hoffman, as well as Ronald (1946), could easily have studied this symptom, as food was rationed in this country. It would also have been interesting to watch the consequences of withholding extra food.

Levin's hypothesis that both somnolence and morbid hunger are due to lesions of the frontal lobe is untenable, because such lesions usually produce other well-known symptoms such as euphoria, loss of initiative, perseveration, changes in personality, and so on. From the clinicopathological material studied by Davison and Demuth (1945) there is no evidence that lesions of the brain responsible for somnolence or hypersomnia also cause gastric disturbances. The association of these two symptoms is purely incidental, and the so-called Kleine-Levin syndrome is not a definite entity. These arguments apply with equal force to other hypersomnia syndromes.

Summary

Sixty-seven patients who complained of somnolence and hypersomnia were studied.

The association of somnolence and excessive appetite was incidental; both were hysterical symptoms.

The case history of a patient is reported.

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A COMPARISON OF THE WASSERMANN AND KAHN REACTIONS

BY

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During the period June to September, 1949, 2,223 Wassermann (Wyler, 1929) and Kahn (1928) tests were carried out in parallel; on some occasions the two tests were carried out on the same day, on others on consecutive days. In order to make the comparison a fair one, when the tests were carried out on consecutive days the Wassermann was done first and the Kahn second, and the Kahn first and the Wassermann second alternately. The Wassermann antigen was obtained from the Ministry of Health Reference Laboratory and the Kahn antigen* from Dr. Kahn himself. Approximately half the specimens came from a V.D. clinic, male and female, and the others comprised those from the general wards of several hospitals and antenatal clinics and routine specimens from prospective blood donors and diabetics.

There was agreement (both tests positive, negative, or doubtful) in 2,110 (95%), partial agreement (one test positive or negative and the other doubtful) in 80 (3.5%), and disagreement in 33 (1.5%). As will be seen from Table I, 194 were positive, 1,899 negative, and 17 doubtful.

TABLE I.—Analysis of Results of 2,223 Parallel Tests

Agreement		Partial Agreement		Disagreement	
W.R. negative } Kahn negative } W.R. positive } Kahn positive } W.R. doubtful } Kahn " }	1,899	W.R. positive } Kahn doubtful } W.R. doubtful } Kahn positive } W.R. negative } Kahn doubtful } W.R. doubtful } Kahn negative }	9 33 31 7	W.R. negative } Kahn positive } W.R. positive } Kahn negative }	27 6
	2,110 (95%)		80 (3.5%)		33 (1.5%)

ful with both tests. Of the 80 in which there was partial agreement, 9 gave a positive W.R. and doubtful Kahn, 33 gave a positive Kahn and doubtful W.R., 31 gave a doubtful Kahn and negative W.R., and 7 a doubtful W.R. and negative Kahn. Of the 27 disagreements that gave

*This antigen was kindly given to me by Colonel L. W. Harrison.

a positive Kahn and a negative W.R. 24 were cases of treated syphilis, one was a child presenting no evidence of syphilis but born of syphilitic parents, and two were cases diagnosed as non-venereal and therefore presumably false positives; of the six disagreements with a positive W.R. and a negative Kahn, five were treated cases of syphilis and one was a child, who subsequently gave negative reactions, born of a syphilitic mother; presumably in this case the positive reaction was due to the carry-over of reagin from a syphilitic mother to a healthy child.

The above indicates a very close parallelism between the two tests, the Kahn being rather the more sensitive in cases of treated syphilis. No attempt has been made to assess the absolute sensitivity of these reactions, but both showed a very high degree of specificity. On the whole the W.R. seems to be slightly more reliable and the Kahn rather more sensitive, but it is clear that a combination of the two tests is the optimum.

A second series, similar in every way to the first, except that the Kahn antigens were obtained from two other sources, gave essentially comparable results: 98.7% of 2,298 sera showed complete or partial agreement (see Table II) and 1.3% showed disagreement. Of the 31

TABLE II.—Analysis of 2,298 Parallel Tests

Agreement		Partial Agreement		Disagreement	
W.R. negative } Kahn negative } W.R. positive } Kahn positive } W.R. doubtful } Kahn doubtful }	1,950 207 20	W.R. positive } Kahn doubtful } W.R. doubtful } Kahn positive } W.R. negative } Kahn doubtful } W.R. doubtful } Kahn negative }	16 17 25 32	W.R. negative } Kahn positive } W.R. positive } Kahn negative }	15 16
	2,177 (94.7%)		90 (4%)		31 (1.3%)

sera where there was disagreement between the two reactions, 15 gave positive Kahn and negative Wassermann and 16 gave positive Wassermann and negative Kahn reactions; the former included 9 cases of syphilis, 2 in which there was no information, 1 certain false positive, and 3 probably false positives; the latter included 12 cases of syphilis and 4 false positives. Thus it will be seen that there was little to choose between the two reactions in respect of specificity.

As interesting side-lights on the above, of 86 routine serum examinations on diabetics 3 (3.5%) were positive; 97 blood donors all gave negative reactions; and of 448 routine serum tests in pregnant women 437 were negative, 1 was doubtful, and 10 (2.2%) were positive.

Summary

Two series of Wassermann and Kahn tests were carried out on 2,223 and 2,298 sera. There was close agreement between the two reactions and both showed a high degree of specificity. Both for diagnosis and for control of treatment of syphilis a combination of the two tests seems desirable.

The finding of 2.2% positive reactions in pregnant women and 3.5% in diabetics indicates the advisability of routine tests on these persons.

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