abdominal fullness is due to the distension of the jejunum. The rate of emptying of the gastric remnant and thus of jejunal filling—that is, the x-ray observation that led to the use of the term “dumping”—is a factor in the production of the sensation of fullness, but is unrelated to the rest of the syndrome. Indeed, fullness is not the most distressing part of the syndrome. It is the vasomotor upset—that is, the feeling of warmth, sweating, tachycardia, palpitations—which really distresses the patients, and these symptoms were not reproduced by jejunal distension.

2. The vasomotor component can be completely reproduced by inert substances—that is, both barium and a mercury bag in the gastric remnant.

3. There is no difference in the blood-sugar curve of those with and without the early syndrome.

4. The afferent-loop reflux *per se* is not a cause of the symptoms, because, as has been shown, the incidence of this finding is equal in cases with and without the syndrome.

5. The syndrome can be reproduced fully by a mercury-loaded bag in the gastric remnant, where the weight of the mercury is roughly equal to the weight of a meal known to produce symptoms. This test also suggested that the weight of the gastric contents plus the weight of the contents of the afferent loop are complementary factors in production of the syndrome.

6. If the patient lies down the vasomotor symptoms produced by the mercury bag are abolished. On the other hand, posture had no effect on the sensation of fullness produced by balloon distension of the jejunum.

7. Splanchnic block suggests that the syndrome is mediated by the sympathetic rather than the vagus nerves.

As a result of these studies it appears that several different mechanisms are involved in production of the syndrome—namely, jejunal distension producing a sensation of fullness, and drag produced by the combined weight of the gastric and afferent-loop contents in the erect posture leading to vasomotor effects. Experimentally it has been shown that abolition of the effect of gravity abolishes the latter but not the former. This corresponds with the clinical observation that lying down during an attack causes the vasomotor symptoms to disappear within five minutes, whereas the sensation of fullness may persist for an indefinite period.

In a subsequent paper we hope to present a clinical study of the problem and attempt to correlate it with these experiments.

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THYROID ACTIVITY IN MENTAL PATIENTS

EVALUATION BY RADIOACTIVE TRACER METHODS

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The radioactive tracer method of estimating thyroid function used in these investigations has been reported elsewhere (Haigh and Reiss, 1950; Reiss *et al.*, 1951). Only small doses of radio-iodine are employed, and the method does not depend upon absolute measurements in the thyroid region. The index of thyroid function is calculated from measures of the uptake by the thyroid and of the urinary excretion of radio-iodine. With the particular units chosen, normal values of this function, I_t , have been found to lie in the range—males 1.8 to 8, females 3 to 12. The error in the measurements is about $\pm 20\%$, and there is evidence that the spread of the chosen normal limits is probably too great. It has been found useful to divide each normal range into an upper and lower normal range about the mean normal value.

The investigation can be repeated after two to four weeks without danger to the patient and without error due to the earlier injection. The radiation from the small dose (25 μ c.) of radio-iodine appears unlikely to influence thyroid function, which may be a source of error in methods employing large doses such as that published by Bowman *et al.* (1950) in his survey of 49 psychiatric cases.

Our series consists of 541 cases in an acute psychiatric admission hospital and out-patient clinic, embracing most of the usual psychiatric disorders. The series includes many cases of mental illnesses of recent origin and short duration, and is a fair cross-section of psychoneurotic and psychotic illness.

The Tables show the distribution of the psychiatric categories according to the degree of thyroid activity. Abnormal thyroid values do not seem to be consistently characteristic of any single psychiatric disorder,

TABLE I.—Male Patients

Ranges I_t	Characterization of Range	Objective Anxiety	Depression	Mania	Recent Schizophrenia	Chronic Schizophrenia	Other Psychiatric Disturbances
		No.	No.	No.	No.	No.	No.
0-1.8	Underfunction	28 (44%)	20 (24%)	1 (20%)	8 (33%)	15 (17%)	6 (17%)
1.8-3.6	Lower normal range ..	25 (39%)	17 (20%)	3 (60%)	5 (21%)	21 (24%)	9 (26%)
3.6-8.0	Upper normal range ..	8 (12%)	25 (30%)		5 (21%)	31 (36%)	9 (26%)
8.0-100	Overfunction	3 (5%)	22 (26%)	1 (20%)	6 (25%)	20 (23%)	11 (31%)
	Total (299)	64	84	5	24	87	35

TABLE II.—Female Patients

Ranges I_t	Characterization of Range	Objective Anxiety	Depression	Mania	Recent Schizophrenia	Chronic Schizophrenia	Other Psychiatric Disturbances
		No.	No.	No.	No.	No.	No.
0-3	Underfunction	6 (15%)	28 (23%)	1 (20%)	2 (10%)	2 (11%)	5 (12%)
3-6	Lower normal range ..	2 (5%)	29 (24%)	1 (20%)	2 (10%)	10 (55%)	12 (29%)
6-12	Upper normal range ..	15 (38%)	49 (41%)	2 (40%)	6 (30%)	6 (33%)	18 (44%)
12-100	Overfunction	16 (41%)	13 (11%)	1 (20%)	10 (50%)		6 (15%)
	Total (242)	39	119	5	20	18	41

but analysis shows that: (1) In male anxiety there was underfunction in 44% and functions in the lower part of the normal range in 39% of the cases. Thus in 83% of male anxiety there was a tendency towards reduced thyroid function. (2) In female anxiety, by contrast, 41% are above normal and 38% are in the upper normal range: a tendency to hyperfunction in 79%. (3) In acute female schizophrenia the distribution was similar to female anxiety, with 50% hyperthyrotic, but hyperfunction was not observed in any case of chronic female schizophrenia. (4) There was no tendency to hyperfunction in acute male schizophrenia. (5) In other categories the level of thyroid function did not seem to be significantly related to the psychiatric disorder alone.

Discussion

The method employed seems capable of detecting slight degrees of thyroid hyper- or hypo-activity with a precision hitherto unobtainable, and therefore of analysing the so-called borderline cases. Thyroid abnormality may be an important factor in the production of mental illness (Asher, 1949; Simpson, 1949), but probably because of variable aetiological factors there is no psychiatric reaction characteristic of hyper- or hypothyroidism alone. This is in agreement with the experience of Means (1948) in general medicine. Hypo- and hyper-thyroidism diagnosed on clinical evidence are uncommon in average psychiatric case material.

However, there are indications of thyroid disturbance in schizophrenia, and a low B.M.R. has been reported by Bowman and Fry (1925), Hoskins and Sleeper (1929, 1932), and Hoskins (1946). According to the last-named some schizophrenic patients can tolerate up to 60 gr. (4 g.) of thyroid daily. We have found the same, and regard it as a consequence of under-sensitivity of the body tissues to thyroid hormone and not a sign of hypothyroidism. This may be comparable to the well-known insulin resistance observed in schizophrenia. Further evidence of insensitivity of peripheral tissue in schizophrenia is provided by the paradox cases reported elsewhere (Reiss *et al.*, 1951) in which increased thyroid activity is associated with a low oxygen consumption. The paradox reaction has in some cases been abolished and the B.M.R. brought up to normal, or increased, by

treatment with vasodilating drugs, which presumably facilitated the action of thyroid hormone on peripheral tissues.

The differential diagnosis between anxiety states and hyperthyroidism has always been difficult to make from clinical evidence. The tracer method allows this problem to be studied. The significant incidence of hypothyroidism noted in male anxiety was unexpected. Animal experiments carried out in this laboratory have shown that small doses of adrenaline infused simultaneously (2 μ g./min.) with the radio-iodine inhibit the uptake of the latter by the rabbit thyroid. By analogy we imagine that in male anxiety, when adrenaline is mobilized by frequent psychological stimuli, a state of functional hypothyroidism is created, depending to a great extent on the severity and chronicity of the neurosis. This may explain why chronic anxiety in males even of good personality is often uninfluenced by psychotherapy, for it is probable that prolonged hypothyroidism affects brain metabolism, impairing efficiency and adaptability.

In female anxiety the tendency to a higher rate of thyroid function may be a constitutional attribute linked to the emotional reactions peculiar to the normal female, or there may be some fundamental difference between male and female anxiety neurosis, or it may be due to the female endocrine system.

Many investigators have treated psychotic patients with thyroid with inconclusive results. On the indications of the tracer method, thyroid treatment should be examined afresh. Bearing in mind that, according to animal experiments, the brain is extremely resistant to thyroid hormone, treatment may have to be prolonged, with high doses. Our results so far in chronic anxiety and psychotic material selected and controlled by the tracer method have been encouraging.

Summary

The thyroid activity of 541 psychoneurotic and psychotic patients has been evaluated, using a radio-iodine tracer method.

In over 50% of male anxiety, thyroid activity was subnormal.

In female anxiety, thyroid function was usually hypernormal.

In acute female schizophrenia, thyroid function was usually increased, but was normal or subnormal in the chronic form.

There were no psychiatric reactions characteristic of thyroid abnormality.

The significance of the findings and the possibility of thyroid therapy have been discussed.

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ACUTE UNILATERAL DACRYOADENTITIS

A REPORT OF FOUR PATIENTS

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During the six months October, 1949, to March, 1950, four cases of acute dacryoadentitis were observed among the 3,622 new ophthalmic patients at the General Infirmary at Leeds. This incidence contrasts with the views of many writers who regard it as a rare condition, and several articles describe a single case which is reported by virtue of its rarity. Arlt (quoted by Schirmer, 1877) stated that he had never met a case. Pooley (1884) stated that the condition was rare and reported one instance which was considered to be metastatic in origin, though at the time there was a diphtheritic infection of the conjunctiva of the other eye. Galezowski (1886) also stressed its rarity, but stated that he had met five examples. Weeks (1911) reported the incidence to be 1 in 10,000 ophthalmic cases. Richardson (1942) was able to compile from the literature 37 cases of gonococcal origin and mentioned the causes of acute dacryoadentitis which had been reported.

The clinical features of the four patients with acute dacryoadentitis are described below, and points of particular interest are discussed.

Case 1

Five weeks before admission this patient, a girl aged 16, had had what was thought to be influenza, which lasted two weeks. She made an apparently complete recovery and was able to resume work. The day before admission a painful swelling appeared in the upper lid of the left eye and was accompanied by malaise and lack of appetite.

On examination the patient was rather lethargic. Her temperature was normal, pulse 80, respirations 18. There was no cough, and the chest condition seemed normal. Radiologically the paranasal sinuses appeared normal.

Ocular Condition.—A swelling was seen in the upper lid of the left eye, situated mainly at the outer aspect but extending to involve the whole lid and adjacent frontal region. The swelling was tense and tender; the eye was considerably proptosed, but there was only slight chemosis of the bulbar conjunctiva. Eye movements were almost

absent. A radiograph of the sinuses showed no evidence of infection.

Systemic administration of penicillin and sulphanilamide was accompanied by the instillation of penicillin drops and application of heat to the eye. After a few days the swelling became less tense and subsided, allowing palpation of a firm lump in the upper lid which was felt to extend forwards from under the superior orbital margin. The general condition improved as the swelling diminished. When the patient was seen after four weeks no lump could be palpated and the chemosis had disappeared, but there was still slight ptosis and some weakness of the left superior rectus.

Case 2

Three weeks before attending hospital this patient, a boy aged 10, had had what was thought to be tonsillitis, for which he was confined to bed for one week. He made an apparently complete recovery and was able to resume school. Four days before admission a painful swelling appeared in the right upper lid, accompanied by considerable malaise and loss of appetite. One intramuscular injection of penicillin had been given by his own doctor.

On examination his general state was one of languor and apathy. His temperature was normal and pulse 80. The patient had a loose cough, and rales and rhonchi were heard in the chest. Radiological examination revealed some haziness of the paranasal sinuses.

Ocular Condition.—The right upper lid was swollen. This swelling was mainly in the outer part, but involved the whole lid and extended into the frontal region. It was tense and tender and there was complete ptosis. The eyeball was considerably proptosed, the conjunctiva was chemotic and bulging between the lids. Movements of the eye were almost absent. Acute tenderness was felt on palpation over the right malar bone. Both fundi appeared normal. Radiologically there was thickening of the mucosa of the frontal sinuses; this was not considered an adequate cause for the swelling of the lid.

Systemic administration of penicillin and "sulphatriad" was accompanied by instillation of penicillin drops and the application of heat to the eye. Next day the pulse rate had increased to 90 though the temperature remained normal, so an incision was made over the swelling and forceps were inserted. No pus appeared until the orbital septum had been pierced, when about 0.5 ml. of creamy pus was evacuated. During the next seven days the swelling and proptosis subsided and a lump could be palpated in the upper lid. This lump was felt to extend forwards from under the superior orbital margin. When the patient was seen five weeks later there was a complete recovery of both the general and the local condition.

Case 3

A girl aged 16 had recently had an attack of what was considered to be influenza. She was in bed for one week and then returned to school for two weeks. Four days before she attended hospital a painful swelling appeared in the upper lid of the left eye, mainly at the lateral aspect. The swelling increased during the next few days and was accompanied by ptosis and chemosis.

On examination her general condition was one of languor and malaise. Her temperature and pulse were normal.

Ocular Condition.—The left eye showed complete ptosis, with a tender tense swelling occupying the upper lid, mainly in its outer part and extending into the forehead. There was considerable chemosis, mainly of the lateral bulbar conjunctiva. Slight proptosis was present and movement of the globe was limited in all directions. Radiological examination revealed no evidence of infection of the paranasal sinuses.

Systemic administration of penicillin and sulphatriad was accompanied by the instillation of penicillin drops and the application of heat to the eye. The swelling subsided gradually, and after four to five days a lump became