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# Thyroid Function Screening in Psychiatric In-Patients

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Summary: During a two-year biochemical screening for thyroid disease amongst 191 psychiatric admissions, 38 (20 per cent) had an abnormal result, 5 were hyperthyroid and 7 hypothyroid. Thyroid dysfunction was associated with female sex and affective psychosis, but not with age. During the three weeks before admission the patients with an abnormal result had been prescribed significantly more phenothiazines, antiparkinsonian drugs and lithium than the patients with normal thyroid function. Almost half of those with abnormal function were physically ill on admission. Despite these findings we concluded that in most patients thyroid dysfunction was not a major determinant of the psychiatric disturbance.

The psychiatric manifestations of thyroid disease have long been recognized (Gull, 1873; Asher, 1949; Henderson and Gillespie, 1962). There is uncertainty, however, about the prevalence of thyroid disorder among the mentally ill. McLarty *et al* (1978) found thyroid disease to be no commoner among mental hospital inmates than in the general population, while Nicholson *et al* (1976) reported a figure of 8 per cent in newly admitted female psychiatric patients. Moreover, there are conflicting reports about the psychiatric symptoms characteristic of thyroid disease, for example impaired consciousness (Tonks, 1964), mild depression (Bahemuka and Hodkinson, 1975) and a combination of paranoid and depressive features (Nicholson *et al*, 1976). The need for routine thyroid screening in psychiatry is as yet unclear.

This paper describes the results of thyroid function screening of patients admitted to the psychiatric unit of Northwick Park Hospital, serving 150,000 people of the London Borough of Harrow, from 1st August, 1974 until 31st July, 1976. This was a preliminary to a more comprehensive prospective investigation. Besides clarifying the issues mentioned above, we also hoped to identify some aetiological clues.

## Method

One hundred and ninety one patients (70 males and 121 females), comprising 64 per cent of consecutive admissions under the care of M.W.P.C., had screening tests for thyroid dysfunction as part of routine clinical care. The major diagnostic groups were: affective psychoses (25 per cent), schizophrenia (28 per cent) and organic psychoses (5 per cent). Those who were not screened because of technical difficulties, very brief stay or lack of cooperation, did not differ significantly in sex ratio, age or diagnosis from the screened patients.

At that time, the screening tests comprised T3-uptake by the Thyopac-3 test kit and serum T4 estimations with the Thyopac-4 kit. In interpreting results we used the free thyroxine index (T4/T3: FTI) because of factors capable of distorting thyroid-binding protein levels in these patients. The normal reference ranges were: T3, 95–119 per cent; T4, 60–150 n mol/l; FTI, 0.60–1.50. We diagnosed hyperthyroidism if one of three criteria were reached: successively raised FTI's during the same admission (Bahemuka and Hodkinson, 1975), a single FTI exceeding 1.55 (Britton *et al*, 1975) or a well-founded clinical diagnosis of thyrotoxicosis. Hypothyroidism was diagnosed if successive FTI's within the same admission were low, if a single FTI was below 45 (Britton *et al*, 1975), if the TSH exceeded 7.0 mU/l or if there was a well-founded clinical diagnosis of myxoedema.

## Results

Thirty-eight (20 per cent) of the patients had one or more abnormal result: abnormal $T_3$ in 11 per cent, abnormal $T_4$ in 9 per cent and abnormal FTI in 7 per cent. Five patients were hyperthyroid and 7 hypothyroid.

The mean ages of euthyroid (50.1, S.D. 16.9 years) and dysthyroid (45.7, S.D. 17.8 years) patients did not differ significantly. Twenty-seven per cent were aged 65 or more. This is above the national average but not markedly different from the Harrow population.



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There were significantly more abnormal results ($P < 0.05$) among females (25 per cent) than among males (11 per cent).

With the exception of the T3 results, there were significantly more diagnoses of affective psychosis among the patients with abnormal results than with normals (Table I).

Seven-seven per cent of all the patients with abnormal function had been prescribed drugs in the three weeks before admission compared with 60 per cent of the patients with normal function. This was not a significant difference. When patients were compared according to type of drug (Table II), there was a significant excess of phenothiazines, anti-parkinsonian agents and lithium carbonate among the patients with abnormal function.

Forty-four per cent patients with thyroid dysfunction had one or more physical illnesses (excluding malnutrition, poor hearing and impaired vision).

The seven hyperthyroid patients had a mean age of 48 years (range 24–62) and mean length of psychiatric history of 2.1 years (range 1–5). Three patients had been diagnosed as thyrotoxic before the onset of mental symptoms. In the remainder it was first detected by routine screening on admission. In these latter patients the mental symptoms appeared to have antedated the thyroid disorder. Five had affective psychoses, one neurotic depression and one schizophrenia.

The nine hypothyroid patients had a mean age of 50.8 years (range 27–74) and mean length of psychiatric history of 6.9 years (range 3–13). One patient previously diagnosed as hyperthyroidism and treated with thyroidectomy was the only instance of overt hypothyroidism antedating mental symptoms. Two had shown signs of myxoedema on admission and in six this was detected as a result of routine screening. Five patients had affective psychoses, two had schizophrenia, one had epilepsy and one had alcoholism.

## Discussion

Abnormal function may not mean thyroid disease, as 5 per cent of euthyroid subjects have an abnormal T4 (Siddiqui, 1978). Factors which may affect thyroid-binding proteins include pregnancy, nephrosis, liver

TABLE I

*Diagnoses made in patients with abnormal thyroid function*

| | | Thyroid function | | |
|---|---|---|---|---|
| | | Normal | Abnormal | Significance |
| T4 | Affective psychosis | 38 | 9 | $\chi^2 = 6.49$ $P < 0.02$ |
| | Others | 136 | 8 | |
| FTI | Affective psychosis | 37 | 10 | $\chi^2 = 15.23$ $P < 0.001$ |
| | Others | 140 | 4 | |
| Thyroid disorder | Affective psychosis | 39 | 8 | $\chi^2 = 9.91$ $P < 0.01$ |
| | Others | 140 | 4 | |

TABLE II

*Relationship between drug prescription prior to admission and thyroid function*

| | Thyroid function | | | |
|---|---|---|---|---|
| Type of drug | Abnormal | Normal | $\chi^2$ | P |
| Anti-parkinsonian | 13 | 8 | 11.13 | <0.001 |
| Phenothiazines | 17 | 21 | 7.07 | <0.01 |
| Lithium carbonate | 7 | 5 | 4.43 | <0.05 |

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disease, oral contraceptives, perphenazine, anabolic steroids, androgens, corticosteroids, phenytoin and salicylates. However, these were uncommon in our patients and the FTI results were not influenced by them. Most of the patients with abnormal function took other drugs prior to admission—phenothiazines, antiparkinsonian agents, tricyclic antidepressants and benzodiazepines, or had physical illnesses not linked with thyroid disorder.

Our prevalence rates for *thyroid dysfunction* are higher than reported for a normal population (Tunbridge *et al*, 1977) or for chronic psychiatric in-patients (McLarty *et al*, 1978), but were comparable with a North American study of psychiatric in-patients (Clower *et al*, 1969). In agreement with studies of female psychiatric admissions (Nicholson *et al*, 1976) and geriatric in-patients (Bahemuka and Hodkinson, 1975) we found a raised incidence of *thyroid disorder*.

In most of our cases, psychiatric symptoms apparently preceded evidence of thyroid disorder. Although this may suggest that the thyroid condition was always the result of some aspect of the psychiatric state, it may be that thyroid symptoms were at first mistaken for psychiatric. For example, aches and pains, weight change and hyperkinesis may occur in both psychiatric and thyroid disorders. Nearly all of our patients with biochemical evidence of thyroid disorder had symptoms compatible with either condition. It is possible therefore that the manifestations of thyroid disease take longer to become clinically apparent than those of psychiatric disorders. The relationship between thyroid and psychiatric disease may have a number of facets. One suggestion is that psychotropic drugs other than lithium carbonate may have effects on thyroid status.

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