

STRESS, PERSONALITY AND HYPERTHYROIDISM

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SYNOPSIS

A study of stressful life events in patients with hyperthyroidism showed that those who had been treated previously but relapsed, experienced more events in the past 12 months compared to patients with first occurrence of the illness ($p < 0.02$). The latter group did not encounter more stressful events compared to patients with non-toxic goitre ($p > 0.05$). There was no significant difference ($p > 0.05$) in personality profiles between patients with hyperthyroidism and non-toxic goitre.

INTRODUCTION

The relevance of the mind-body nexus in clinical practice has often been emphasised. This holistic approach also encompasses their interaction with the social environment. Research in this area seeks to demonstrate characteristic psychological profiles and stresses associated with illnesses.

The term 'stress' can be defined as any stimulus or change in the internal or external environment of such intensity or duration as to tax the adaptive capacity of the organism, and which in certain circumstances lead to disorganisation of behaviour, maladaptation or dysfunction (1). What constitutes stress to some may not be at all stressful to others. Therefore it is important to consider the sensitivity and susceptibility of the individual.

It has been noted by Mandelbrote and Wittkower (2), and Harrison (3) that patients who developed hyperthyroidism are more vulnerable in respect of psychological constitution. Morillo and Gardner have reported case histories of bereavement antedating the onset of hyperthyroidism in children (4), and Gurney et al (5) have also emphasised the instability of the premorbid personality in patients with hyperthyroidism.

In recent years a more systematic approach to the possible role of stress in illness has been the study of life events (eg. death in the family, promotion, retirement, etc). There is a plethora of literature on life events precipitating psychiatric illness (6,7,8) but the association with physical illness is less convincing (9,10). Murphy and Brown (11) have suggested that the relationship between life events and the onset of physical illness is not a direct causal association but mediated by an intervening psychiatric disturbance of an affective kind.

The aim of this study was to ascertain if there were any differences in recent life experiences and personalities between patients with hyperthyroidism and non-toxic goitre.

METHOD

Thirty-three consecutive Chinese patients with hyperthyroid Graves' disease, seen in a medical department at the Singapore General Hospital, were inducted into the study. The presence of thyrotoxicosis was based on clinical assessment and thyroid function tests, as was previously described by Yeo et al (12).

There is no study with standardised life events scale in thyroid disorder, and in this investigation we used the Schedule of Recent Experiences (SRE) constructed by Holmes and Rahe (13). This scale is based upon the 'life chart' device introduced by Adolf Meyer. Holmes and Rahe have noted that events which would normally be considered as stressful eg. death or divorce, are not the only events of importance, but even desirable changes, eg. promotion or change of accommodation, are also relevant. The theme common to all these life events is that they evoke or are associated with some adaptive or coping behaviour on the part of the individual. The advent of each event requires a change in life pattern — hence the emphasis is on a change from the existing steady state. Life changes, whether stressful or pleasant, have additive effect and tax the adaptive capacity of the individual.

All the patients in the study self-administered the Schedule of Recent Experience (SRE), which has been translated into Mandarin. The SRE consists of 43 events along with assigned weights or score indicating a relative degree of readjustment associated with each event, eg. death of spouse has the highest score. The SRE score can be expressed as the total number of events (unweighted score) or the total weights of all the events (weighted score) encountered by the individual within the last 12 months. The method for scaling the life event is derived from psychophysics which deals with subjective quantification of certain experiences. The SRE has been widely used for measuring life stresses and even with groups of different ethnicity and culture there is good agreement about the weights assigned to each event (14,15). To apply the scale in the Singapore setting minor modifications have to be made. For example the items, 'Christmas' is substi-

tuted with 'Chinese New Year', 'church activities' with 'religious activities' and the mortgage or loan of \$10,000 is converted to the Singapore equivalent of \$25,000.

The personality profiles of all the patients with hyperthyroidism and non-toxic goitre, were assessed by the Eysenck Personality Inventory (EPI). This measures personality traits along two dimensions, ie. extroversion-introversion and neuroticism (emotionality, anxiety, instability). The EPI is an often-quoted self-rating personality assessment instrument.

Demographic characteristics of the patients noted were: sex, age, marital status and employment. Statistical analysis was by chi-square for sex, marital status and employment; and t-test for age, EPI and SRE scores, and thyroid function tests.

RESULTS

In this study there were 33 patients with hyperthyroidism — 5 were excluded because they could not fill the questionnaires due to a lack of education. Thirteen patients were treated previously but had relapsed and 15 were diagnosed for the first time. The mean duration of illness in the former group was 4.3 years. There were 11 patients with non-toxic goitre. Table 1 shows the characteristics of these three groups of patients. There were more females in all the groups; one patient, a widow with relapsed hyperthyroidism was included in the category 'single' for marital status. Statistical analyses indicated that there were no significant differences among the three groups in respect of sex, age, marital status and employment. There was also no significant difference ($p > 0.05$) in severity between the 2 groups of hyperthyroid patients in thyroid function tests.

The Schedule of Recent Experiences (SRE) scores are illustrated in Table 2. In comparing new cases of hyperthyroidism and non-toxic goitre, although the former had higher scores in both mean unweighted and weighted SRE scores, the differences were not statistically significant ($p > 0.05$). But comparing the two groups of hyperthyroid patients, the relapsed group scored higher in both mean unweighted and weighted SRE scores — the differences were statistically significant ($p < 0.05$ and $p < 0.01$ respectively).

Analysis of the types of events checked by the patients showed that the common events in the three groups were major personal illness, vacation and Christmas/Chinese New Year. But patients with relapsed hyperthyroidism had experienced more stressful events like death of a close family member, major change in health of family members, marriage, pregnancy and increased responsibilities at work.

On the Eysenck Personality Inventory, there was no significant difference between patients with hyperthyroidism and non-toxic goitre along the axes, extraversion-introversion (E) and neuroticism-stability (N).

TABLE 1
CHARACTERISTICS OF PATIENTS WITH THYROID DISORDERS

	Sex		Age in years (Mean \pm s.d.)	Marital Status		Employment	
	Male	Female		Married	Single	Yes	No
Hyperthyroidism							
New cases	3	12	33.5 \pm 2.5	11	4	12	3
Relapsed	2	11	35.2 \pm 2.6	10	3	11	2
Non-toxic goitre	2	9	32.5 \pm 3.1	8	3	8	3

TABLE 2
MEAN SCORES OF SCHEDULE FOR RECENT EXPERIENCES

	Unweighted Score (mean \pm s.d.)	Weighted Score (mean \pm s.d.)
Hyperthyroidism		
New cases (n = 15)	2.93 \pm 1.1*	88.5 \pm 14.1**
Relapsed (n = 13)	4.15 \pm 1.7*	108.1 \pm 16.5**
Non-toxic goitre (n = 11)	2.45 \pm 1.5	84.4 \pm 10.2

* t = 2.22, P < 0.05 (two-tailed)
** t = 2.68, P < 0.01 (two-tailed)

DISCUSSION

The three groups of patients in this study were well matched in respect of age, sex, marital status and employment. These are important factors to consider especially when administering the Schedule for Recent Experiences, because the events in the schedule are related to these characteristics.

The results of the SRE scores indicated that patients who had been treated previously for hyperthyroidism but relapsed, seemed to have encountered more stressful life events in the past 12 months, when compared to patients with first occurrence of the illness. It has been argued by Lishman (16) that psychological factors may indeed be precipitants but the problem is in excluding the possibility that emotional traumata at the onset may themselves have been the by-products of early and unsuspecting thyroid overactivity. The controversy is whether the event reported contributes to the development of the illness or is the consequence of the illness. This may occur in hyperthyroidism because early onset of irritability could lead to relationship problems at work or home, and this breakdown of relationship may be misinterpreted as stress precipitating the illness. In our study this possibility is reduced by comparing two groups of patients with the same illness. Moreover the types of events experienced by patients with relapsed hyperthyroidism, such as death of a close family member, marriage, pregnancy and increased responsibilities at work could not possibly be influenced by the illness.

This study suggests that some hyperthyroid patients, although treated and are euthyroid, may be vulnerable to stressful environmental or ecological factors, which could precipitate a relapse of the illness. There was no statistical difference between the recent life experiences of the patients with non-toxic goitre and patients with first occurrence of hyperthyroidism.

The mechanism by which stress may precipitate hyperthyroidism has been suggested as through the hypothalamic-pituitary axis with a resultant increase in pituitary thyroid stimulating hormone (TSH). However, Volpe (17) has argued that the evidence militates against the hypothesis that stress acts by means of the hypothalamic-pituitary-thyroid axis and direct stimulation of the thyroid. He has suggested that hyperthyroidism is an autoimmune disease, and stress mediates possibly through the Corticotrophic Releasing Hormone (CRH) — Adreno Cortico-Tropic Hormone (ACTH) cortisol axis. The corticosteroids can impair immune surveillance by suppressor 'T' lymphocytes.

This mechanism may be sufficient to precipitate the illness in predisposed persons as a result of a partial defect in the immune surveillance.

In contrast to previous reports on personality profiles of patients with hyperthyroidism (3,5), we were unable to differentiate between the hyperthyroid and non-toxic goitre groups on the Eyesenck Personality Inventory. This could be due to different personality tests used in the other studies and hence measuring different personality traits; and secondly it may be because of different control groups.

REFERENCES

1. Rees WL: Stress, distress and disease. *Br J Psychiat* 1976; 128: 3-18.
2. Mandelbrote BM, Wittkower ED: Emotional factors in Graves' Disease. *Psychosom Med* 1955; 17: 109-14.
3. Harrison TS: Adrenal medullary and thyroid relationships. *Physiol Rev* 1964; 44: 161-85.
4. Morillo E, Gardner LI: Bereavement as an antecedent factor in thyrotoxicosis of childhood. *Psychosom Med* 1979; 7: 545-59.
5. Gurney C, Hall R, Harper M, Roth M. The differentiation of hyperthyroidism and psychiatric disorder. In: Slater E, Roth M. eds. *Clinical psychiatry*. 3rd ed. London, Bailliere, Tindall and Cassel; 1969; 96-7.
6. Brown GW, Sklair F, Harris TO, Birley JLT: Life events and psychiatric disorders. *Psychol Med* 1973; 3: 74-87.
7. Cooper B, Sylph J: Life events and the onset of neurotic illness: an investigation in general practice. *Psychol Med* 1973; 3: 421-35.
8. Paykel ES: Contribution of life events to causation of psychiatric illness. *Psychol Med* 1978; 8: 245-53.
9. Andrews G, Tennants C: Being upset and becoming ill: an appraisal of the relation between life events and physical illness. *Med J Aust* 1978; 1: 324-7.
10. Schless AP, Teichman A, Mendels J, et al: Life events and illness — 3 years prospective study. *Br J Psychiat* 1977; 131: 26-34.
11. Murphy E, Brown G: Life events, psychiatric disturbance and physical illness. *Br J Psychiat* 1980; 136: 326-38.
12. Yeo PBB, Gwee HM, Tan NB, et al: T3 toxicosis and its relation to the iodide status in Singapore. *Aust NZ J Med* 1976; 6: 311-4.
13. Holmes TH, Rahe RH: The social adjustment rating scale. *J Psychosom Res* 1967; 11: 213-8.

14. Komaroff AL, Masuda M, Holmes TH: The social readjustment rating scale: comparative study of Negro, Mexican and white Americans. *J Psychosom Res* 1968; 12: 121-8.
15. Rahe RH: Multi-cultural correlations of life change scaling: American, Japan, Denmark and Sweden. *J Psychosom Res* 1969; 13: 191-5.
16. Lishman WA. Endocrine diseases and metabolic disorders. In: *Organic psychiatry*. London, Blackwell Scientific Publications, 1978: 595-6.
17. Volpe R: The role of autoimmunity in hypoenocrine and hyperendocrine function. *Ann Intern Med* 1977; 87: 86-99.