Relationship between levels of thyroid stimulating hormone, age, and gender, with symptoms of depression among patients with thyroid disorders as measured by the Depression Anxiety Stress Scale 21 (DASS-21)

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Objective: The aim of this study was to investigate the correlation between levels of depression symptoms and age, thyroid-stimulating hormone levels, and stressful life events of the participants.

Method: Patients above 18 years old, with any thyroid disorders, and without psychiatric disorders were included in this study. All participants completed the Depression Anxiety Stress Scale 21 (DASS-21). The depression symptom score was calculated and interpreted as follows: less than 9: no depression; between 10 and 13: mild depression; between 14 and 20: moderate depression; between 21 and 27: severe depression, and more than 28: extremely severe depression.

Results: The total number of participants in this study was 199. There was no correlation between age, thyroid stimulating hormone, and the DASS score. There was also no significant difference in the DASS-21 score between genders. However, there was a positive correlation between depression symptoms and stressful life events (r = 0.201, n = 199, p < 0.05).

Conclusions: These findings would suggest that increased depression symptom scores correlate with increased stressful life events. A larger study should be undertaken to confirm these findings.

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Relationship between levels of thyroid stimulating hormone, age, and gender, with symptoms of depression

Introduction

Depression symptoms have been described in patients who had thyroid disorders. Studies of Asian countries, such as Nepal and Turkey, have found that about 24% of patients with thyroid disorders also suffer from depression symptoms. However, it is unclear whether the association between these conditions is due to the paucity of research in this area. The association between thyroid-stimulating hormone (TSH) and depression symptoms is debatable worldwide. Williams et al. reported that, in a study of 2,269 middle-aged men, a high level of TSH and a higher level of free thyroxine (fT4) was associated with a risk of developing depression symptoms. Similarly, a significant association between high TSH and fT4 levels and depression symptoms, evaluated using the Hamilton Rating Scale for Depression (HDRS), was found in 19 of 80 patients newly diagnosed with thyroid disorders. In contrast, a large-scale population study by Ittermann et al. showed that there is no significant association between TSH levels and depression in untreated thyroid disorders in patients in Germany, as analyzed using the Beck Depressive Inventory-II (BDI-II). These conclusions could be due to the variety of tools used to assess depression symptoms. Sample size and study design also may have affected the results.

Several studies in Europe have found that, certain levels of depression were reported among women with thyroid disorders, and all of these studies showed a significant association between TSH and depression symptoms. Similarly, a significant association between high TSH and fT4 levels and depression symptoms, evaluated using the Hamilton Rating Scale for Depression (HDRS), was found in 19 of 80 patients newly diagnosed with thyroid disorders. In contrast, a large-scale population study by Ittermann et al. showed that there is no significant association between TSH levels and depression in untreated thyroid disorders in patients in Germany, as analyzed using the Beck Depressive Inventory-II (BDI-II). These conclusions could be due to the variety of tools used to assess depression symptoms. Sample size and study design also may have affected the results.

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The mean was 46.32 ± 15.16 years old. The participants consisted of three main races in Malaysia: Eighty-five (43.7%) were Malay; eighty-three (42%) were Chinese; and thirty-one (16%) were Indian. Sixty-four percent (64%) were married (n = 127); 56 (28%) were single; and 16 (1.7%) were widows/widowers. Most participants worked in the government and the private sector (59.3%). Most of the respondents (72%) had an income of more than RM1000 (USD 226), and fifty-six of the participants (28%) had income of less than RM1000 (USD 226). Most of the respondents completed secondary school (52.3%).

A Pearson product-moment correlation coefficient was computed to assess the relationship between age, gender, TSH, stressful life events, and depression symptoms levels. It is interesting to note that the only positive correlation was between stressful life events and depression symptoms levels, where r = 0.201, n = 199, and p = 0.004. Age, gender, and TSH levels show negative correlations and are not statistically significant (Table 2).

Discussion

In this study, the majority of the participants are in the middle-aged group (from 40 to 60 years old), most participants are female, and most participants are married and employed.

To identify the severity of depression symptoms, DASS-21 was used in this study. This tool has proven to have good reliability and validity and is widely used in psychiatry and other health care settings. Moreover, the DASS-21 uses simple words and is convenient to administer in a large study population.

Through statistical analysis, this study found a negative correlation, with no statistical significance between TSH levels and depression symptoms. This finding is supported by Almeida et al. in a study on 3,932 men and the results showed that TSH concentration does not affect incidents of depression. Another two studies report that there is no relationship between TSH levels and depression symptoms in patients with a variety of thyroid disorders. Synthesis of findings of several previous studies shows that there are consistent findings between this current study and other studies with regards to the negative correlation between TSH level and depression symptom. However, Panicker et al. have reported contrary findings. Panicker et al. found that, there is a significant interaction between TSH level and depression symptoms. Therefore, it is assumed that, the reason for the inconsistency of findings between this current study and a study by Panicker et al. is probably due to the variety of sample characteristics involved in this current study as opposed to the Panicker et al study. Although both studies (this current study and Panicker et al.) involve thyroid patients as samples, insignificant findings are probably due to the small sample size and the single setting. Therefore, a larger study is needed to clarify the inconsistencies found in the literature.

Interestingly, this current study shows positive correlations and statistical significance between stressful life events and depression symptoms. This finding is similar to the Fukao et al., Kahaly et al., and Bock et al. Fukao et al., for instance, reported that the stress score of life events correlated significantly with the depression score, as evaluated by Natsume’s Stress Inventory tool, on 64 hyperthyroid patients. Furthermore, in another study by Kahaly et al., a stressful life event has been found in 40.2% (n = 102) of hyperthyroid patients before developing symptoms of depression. Congruently, a study by Bock et al. reported that 62.8% (n = 301) patients have a history of at least one moderate to severe stressful life event in a six month period prior to the onset of depression symptoms. However, most of the studies present above only provide descriptive findings on the stress-
ful life events. Therefore, the relationship between the stressful life event and depressive symptoms remains unclear.

Limitations

Several limitations have been addressed in this study. First, the results could not be generalized because the study was conducted in a single setting only. Second, depression is a multi-factor disorder and should be controlled by several factors, such as family and social history, heredity, and morbidity. Moreover, the DASS-21 is a self-report tool, and the result may be more optimistic than reality. Last, due to the nature of the cross-sectional study design, the sample size is relatively small, and, consequently, the statistical power of the study decreases. Therefore, a larger sample is needed to confirm the study’s findings.

References