

MEASUREMENT OF ANXIETY LEVELS IN DIFFERENTIATED THYROID CANCER PATIENTS

Diferansiye Tiroid Kanseri Hastalarında Anksiyete Düzeylerinin Ölçülmesi

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ABSTRACT

Objective: In this study, our aim was to determine the anxiety levels of patients diagnosed with Differentiated Thyroid Cancer and to investigate the relationships between anxiety and factors such as age, sex, marital status, the presence of metastasis, time since diagnosis, whether they received radioactive iodine therapy, and the dose of radioactive iodine they received.

Material and Methods: This study was conducted between January 2024 and June 2024. Clinical findings and demographic data of 164 patients who applied to the nuclear medicine outpatient clinic were recorded, and anxiety levels were measured via the Beck Anxiety Inventory. Statistical analyses were performed via SPSS 23.0. The statistical significance level was accepted as $p<0.05$.

Results: When the gender of the patients was compared with the Beck anxiety level, a statistically significant relationship was found ($p=0.008$). Anxiety levels were higher in women. No significant relationship was found between the marital status, the presence of metastasis, the status of receiving radioactive iodine treatment or histopathological subtype and the Beck anxiety level.

Conclusion: Anxiety levels in patients with differentiated thyroid cancer were found to be significantly higher in females than in males.

Keywords: *Thyroid Cancer; Anxiety; Beck Anxiety Inventory*

ÖZET

Amaç: Bu çalışmada amacımız Diferansiye tiroid kanseri tanısı almış hastaların anksiyete düzeylerini belirlemek ve anksiyete ile yaş, cinsiyet, medeni durum, metastaz varlığı, hastalığın başlangıç zamanı, radyoaktif iyot tedavisi alıp almadıkları ve aldıkları radyoaktif iyot dozu gibi faktörler arasındaki ilişkileri araştırmaktır.

Gereç ve Yöntemler: Bu çalışma Ocak 2024- Haziran 2024 tarihleri arasında yürütülmüştür. Nükleer tıp polikliniğine başvuran 164 hastanın klinik bulguları ve demografik verileri kaydedildi ve anksiyete düzeyleri Beck Anksiyete Envanteri ile ölçüldü. İstatistiksel analizler SPSS 23.0 ile yapıldı. İstatistiksel anlamlılık düzeyi $p<0,05$ olarak kabul edildi.

Bulgular: Hastaların cinsiyeti Beck anksiyete düzeyi ile karşılaştırıldığında istatistiksel olarak anlamlı ilişki bulundu ($p=0,008$). Kadınlarda anksiyete düzeyi daha yüksekti. Medeni durum, metastaz varlığı, radyoaktif iyot tedavisi alma durumu veya histopatolojik alt tip ile Beck anksiyete düzeyi arasında anlamlı ilişki bulunmadı.

Sonuç: Diferansiye tiroid kanserli hastalarda anksiyete düzeyleri kadınlarda erkeklere göre anlamlı olarak daha yüksek bulunmuştur.

Anahtar Kelimeler: *Tiroid Kanseri; Anksiyete; Beck Anksiyete Envanteri*

INTRODUCTION

Cancer is a serious health problem that causes a large proportion of deaths if it is not diagnosed and treated early. It accounts for 25% of deaths in developed countries and is the second most common cause of death after ischaemic heart disease (1). Cancer is responsible for approximately 10% of deaths worldwide and is a chronic disease that threatens life (2). In addition to causing many deaths, cancer also causes psychiatric disorders (3). For patients with advanced cancer, the elevated risk of mortality is a critical concern, while the side effects associated with cancer therapies and the demands of the treatment regimen constitute significant stressors. Knowing the physical severity of the disease, its course and the psychological conditions that may affect the response to treatment affects the patient's quality of life, care and compliance with treatment. Notably, cancer patients need psychosocial support in addition to medical treatment (4). Differentiated thyroid cancer (DTC) is the most common type of endocrine cancer worldwide and ranks 9th in terms of overall cancer incidence (5). Despite its increasing incidence, the prognosis of DTC is very good, with a reported 5-year survival rate of 87%. DTC is usually asymptomatic in the early stages, but as the disease progresses, symptoms such as neck pain, hoarseness, and dysphagia may occur. DTC is diagnosed by physical examination, analysis of thyroid hormone levels, imaging, and biopsy (6). The management of DTC depends on the type of cancer, stage, and patient preference. For low-risk thyroid cancer patients, annual surveillance is recommended instead of immediate treatment (7). The most common intervention is surgery, which includes complete removal of the thyroid, removal of a single lobe of the thyroid, and/or lymph node dissection (8). Radioactive iodine therapy (RIT) is another treatment option that complements surgery, although it has some side effects (9). Other alternatives to surgery, although less frequently used, include external radiotherapy, chemotherapy and targeted drug therapy (8). In addition to surgery and RIT, thyroid hormone supplementation is mandatory and should be used lifelong to suppress cancer growth stimulated by TSH (6). Cancer patients often experience significant psychological problems, including mood and anxiety disorders (10). Quality of life, including

psychological, social, and spiritual well-being, has become an important consideration in the treatment of cancer survivors (11). An increasing number of studies have been conducted on the quality of life of patients with DTC (12-14). The aim of this study was to determine the anxiety levels of patients with DTC who applied to the Nuclear Medicine Clinic of Pamukkale University Medical Faculty Hospital to investigate the relationships between anxiety and factors such as age, sex, marital status, the presence of metastasis, time since diagnosis, whether they received RIT and the dose of radioactive iodine they received and to compare the results with the literature.

MATERIAL AND METHODS

Before starting the study, ethical approval was obtained from the Pamukkale University Non-Interventional Clinical Research Ethics Committee (dated 26.12.2023 and numbered 21) and similar studies were examined and a power analysis was performed. As a result of the power analysis, it was calculated that 85% power could be achieved at a 95% confidence level with an effect size of $d = 0.97$ if at least 161 people were included in the study. Differentiated thyroid cancer patients who met the study criteria were asked whether they volunteered to participate in this study by explaining the purpose, method and benefits of the study and were asked to sign a written informed consent form, and those who volunteered were included in the study. Participants were informed of their right to withdraw from the study at any time, that the principle of autonomy was strictly adhered to, and that the principle of confidentiality was ensured by informing them that the data obtained would be utilized solely within the scope of this research.

This study is a cross-sectional study. It was conducted between January 2024 and June 2024 at the Nuclear Medicine Clinic of Pamukkale University Faculty of Medicine Hospital. Demographic and clinical patient data used in the study were obtained retrospectively from patient files. The Beck Anxiety Inventory (BAI) was administered via face-to-face interviews and a questionnaire. Each patient interview and form completion took 10-15 minutes. Patients with a psychiatric diagnosis and those receiving psychiatric treatment, as well as patients who did not want to

participate in the study and did not want to continue, were excluded from the study.

The descriptive questionnaire consists of eight questions about patients' sociodemographic and disease-related characteristics (age, sex, marital status, number of months of treatment, histopathological diagnosis, presence of metastasis, whether they received RIT and the RIT dose they received). The patients' anxiety levels were determined by completing the BAI.

The BAI was developed by Beck and colleagues (15). It is a Likert-type scale consisting of twenty-one items. Its validity and reliability in Turkey were determined by Ulusoy and colleagues (16).

Statistical analyses were performed via SPSS (Statistical Package for Social Science for Windows) 23.0. Continuous variables are presented as the means $\pm$ standard deviations, and categorical variables are presented as numbers and percentages. The Mann-Whitney U and Kruskal-Wallis tests were used according to the number of groups to compare independent group differences. In addition, the relationships between continuous variables were examined with the Spearman correlation test. The relationship between treatment duration and Beck Anxiety Score was examined using Pearson correlation analysis. The statistical significance level was accepted as $p < 0.05$.

RESULTS

Among the 164 DTC patients included in the study, 135 (82.3%) were female, and 29 (17.7%) were male. The mean age of the patients was 44.07 ± 11.32 years (range: 16–72). The mean follow-up period of the patients was 45.83 ± 39.24 (range: 2–192) months. A total of 144 (87.8%) of the patients were married, and 20 (12.2%) were single. When histopathological subgroups were examined, 153 (93.3%) had papillary thyroid cancer, 8 (4.9%) had follicular thyroid cancer, and 3 (1.8%) had other histopathological types. At the time of diagnosis, 147 (89.6%) of the patients had no metastasis, whereas 17 (10.4%) had metastasis. Radioactive iodine ablation/treatment was applied to 147 (89.6%) of the patients, whereas 17 (10.3%) of the patients did not receive radioactive iodine ablation/treatment. Among the patients who received RIT, 48

(32.6%) received 0–50 mCi, 76 (51.7%) received 50–100 mCi, and 23 (15.7%) received >100 mCi (Table 1).

Table 1. Sociodemographic characteristics of patients

Age (years)	
mean $\pm$ SD	44.07 $\pm$ 11.32
minimum-maximum	16-72
Sex	
Male	29 (17.7%)
Female	135(82.3%)
Marital status	
Married	144(87.8%)
Single	20(12.2%)
Histopathological type	
Papillary	153(93.3%)
Follikular	8(4.9%)
Other	3(1.8%)
Metastasis	
Yes	17(10.4%)
No	147(89.6%)
Radioactive Iodine Treatment	
Yes	147(89.6%)
No	17(10.4%)
Radioactive Iodine Therapy dosage	
>0- $\leq$ 50mCi	48(32.6%)
50- $\leq$ 100mCi	76(51.7%)
>100mCi	23(15.7%)

Beck Anxiety Inventory score was evaluated as 0-7 points: very mild anxiety, 8-15 points: mild anxiety, 16-25 points: moderate anxiety and 26-63 points: severe anxiety.

When the patients were evaluated according to sex, severe anxiety was distributed in a similar percentage in both genders. However, more than half of the men (58.6%) were in the very mild anxiety group, whereas 26.7% of the women were in the very mild anxiety group (Table 2).

When the patients' sex was compared with the Beck anxiety score, a statistically significant relationship was found (Spearman test; $p = 0.008$). No significant relationships were found between the patients' marital status, presence of metastasis, or RIT status and the mean Beck anxiety score. No statistically significant

relationship was found between histopathological subtype and Beck anxiety score.

When the anxiety status of the patients was examined according to their marital status, no significant difference was observed between married and single patients (Table 3, Spearman test; $p=0.580$).

When the distribution of anxiety levels of patients according to metastasis status was examined, severe anxiety was found to be more than twice as high in patients with metastasis than in those without metastasis (29.4% vs. 13%) (Table 4, Mann-Whitney U test; $p=0.254$).

When the anxiety levels of patients who received RIT and those who did not receive RIT were compared,

those who experienced severe anxiety were similar in both groups. However, most of the patients who did not receive RIT were in the very mild anxiety group, and the mild anxiety rate was lower in patients who received RIT than in those who did not receive RIT (58.6% vs. 3%) (Table 5, Mann-Whitney U test; $p=0.608$).

When the anxiety levels of the patients were examined according to the RIT doses they received, the severe anxiety rate was higher in patients who received a treatment dose greater than 100 mCi (30.4%) (Table 6, Kruskal Wallis test; $p=0.406$).

Treatment duration was not correlated with Beck Anxiety Score (Pearson test; $p=0.215$).

Table 2. Distribution of Anxiety Levels of Patients by Gender

	Total (n=164)	Female (n=135)	Male (n=29)	P value
Very mild	53(32.3%)	36(26.7%)	17(58.6%)	0.008*
Mild	55(33.5%)	49(36.3%)	6(20.6%)	
Moderate	32(19.5%)	30(22.2%)	2(7.0%)	
Severe	24(14.7%)	20(14.8%)	4(13.8%)	

* Spearman test

Table 3. Distribution of Anxiety Levels of Patients According to Marital Status

	Total(n=164)	Married(n=144)	Single(n=20)	P value
Very mild	53(32.3%)	47(32.6%)	6(30.0%)	0.580*
Mild	55(33.5%)	49(34.0%)	6(30.0%)	
Moderate	32(19.5%)	28(19.4%)	4(20.0%)	
Severe	24(14.7%)	20(14.0%)	4(20.0%)	

* Spearman test

Table 4. Distribution of anxiety levels of patients according to metastasis status

	Total(n=164)	Metastasis(yes) (n=17)	Metastasis(no) (n=147)	P value
Very mild	53(32.3%)	4(23.5%)	49(33.3%)	0.254*
Mild	55(33.5%)	6(35.3%)	49(33.3%)	
Moderate	32(19.5%)	2(11.8%)	30(20.4%)	
Severe	24(14.7%)	5(29.4%)	19(13.0%)	

* Mann-Whitney U test

Table 5. Distribution of anxiety levels of patients according to RIT status

	Total(n=164)	RIT(yes)(n=147)	RIT(no)(n=17)	P value
Very mild	53(32.3%)	47(32.0%)	17(58.6%)	0.608*
Mild	55(33.5%)	48(32.7%)	6(20.6%)	
Moderate	32(19.5%)	31(21.0%)	2(7.0%)	
Severe	24(14.7%)	21(14.3%)	4(13.8%)	

* Mann-Whitney U test , RIT:Radioactive Iodine Therapy

Table 6. Distribution of anxiety levels of patients according to the RIT dose they received

	Total (n=164)	RIT(-) (n=17)	>0-≤50mCi (n=48)	50-≤100mCi (n=76)	>100mCi (n=23)	P value
Very mild	53(32.3%)	6(35.3%)	19(39.6%)	23(30.3%)	5(21.8%)	*0.406
Mild	55(33.5%)	7(41.1%)	13(27.0%)	27(35.5%)	8(34.8%)	
Moderate	32(19.5%)	1(6.0%)	9(18.8%)	19(25.0%)	3(13.0%)	
Severe	24(14.7%)	3(17.6%)	7(14.6%)	7(9.2%)	7(30.4%)	

* Kruskal-Wallis Test, RIT:Radioactive Iodine Therapy

DISCUSSION

DTC is an important health problem that scares the patient more than the risk it contains, disconnects the person from life and affects the quality of life. The quality of life of patients with DTC is multifaceted and is affected by various factors related to and unrelated to cancer from the diagnosis stage to the treatment period. Diagnosis and treatment are associated with increased anxiety and depressive symptoms as well as intense physical, emotional, social, occupational and economic difficulties. In addition to the fact that anxiety and depression in cancer patients are strongly and independently associated with mental health and physical symptom burden, depression is also significantly related to quality of life. It is estimated that anxiety and high-level depressive symptoms increase mortality, and monitoring depression treatment is important to extend the life span and improve the quality of life of depressed cancer patients. It has also been reported that monitoring mental health in cancer patients is as important as monitoring physical health, that it should be better integrated with cancer treatment, and that physical health and symptoms directly and mutually affect mental health. In our research, the Beck Anxiety Inventory was used to determine the level of anxiety.

In our patient group, statistically significant results were obtained only between anxiety level and sex. Severe anxiety is observed at similar rates in men and women. It was thought that this situation might be related to the anxiety caused by factors other than the disease and the general prevalence in the society. There was no normal control group in this study. Therefore, this should be validated further. Furthermore, a clinical psychiatric evaluation was not performed on the patients; therefore, it cannot be determined for certain whether the anxiety symptoms stemmed from another psychiatric condition. While more than half of the men

are in the very mild anxiety group, this rate is almost a quarter that of women. Considering that the disease has a worse prognosis in men, it is paradoxical that anxiety levels are lower. Most studies on DTC support the fact that being a woman, as well as being younger at the time of diagnosis, is generally associated with increased anxiety, depression and worse quality of life (17-20). The high anxiety scores in female DTC patients necessitate a more careful evaluation of these patients. When necessary, psychiatric consultation will increase treatment success and compliance.

In another study, when patients with nonthyroidal cancer were examined, anxiety and depression rates were found to be higher in women than in men (21).

In a study conducted by Papaleontiou et al. with 2215 patients, younger age was associated with more anxiety in women with thyroid cancer (22). In our study, there was no relationship between Beck anxiety scores and age. This may be due to other sociocultural characteristics and living conditions of the selected patient groups.

Married or single patients did not differ in terms of anxiety levels. One study revealed that anxiety was greater in DTC patients living alone (23). We believe that being single does not have a negative effect on anxiety in our patient group because the culture of social solidarity and cooperation is more effective in our country. Some studies have shown that being married/having a partner is associated with higher quality of life and lower anxiety (22,24,25).

Although there is no statistically significant relationship between the presence of metastasis and BAS, when we look at the general patient distribution, the rate of severe anxiety is greater in metastatic patients. When all patients were considered, 14.7% had severe anxiety, whereas 29.4% had severe anxiety in metastatic patients. We believe that the lack of statistical significance is due to the relatively low number of

patients in the metastatic patient group. Metastatic disease is associated with more hospital visits and more tests and treatments. This situation may increase anxiety levels in patients.

Whether or not RAI treatment will be applied to our DTC patients, and the amount of RAI to be given to the treated patients were regulated according to the guide published by the American Thyroid Association (6). Low-risk patients either did not receive any RAI treatment or were treated with low doses of RAI. RAI was applied in increasing doses as the disease risk increased. When the distribution of patients' anxiety levels according to whether they received RIT was examined, the majority of patients who did not receive RIT (58.6%) had very low anxiety levels. The distribution of patients who received RIT was similar to that of the general patient group. Patients who do not receive RIT are generally subject to fewer examinations and hospital visits than those in the papillary microcarcinoma and very low-risk patient groups. We believe that this situation also reduces the anxiety levels of patients.

When the distribution of patients' anxiety levels according to the RIT dose they received was examined, those who received a treatment dose of more than 100 mCi presented high anxiety levels. These patients were high-risk and metastatic patients. All of them received RIT while they were inpatients. Due to the complications of high-dose RIT, additional disease findings (dry mouth, neck pain, etc.) may occur in patients and may negatively affect the anxiety levels of patients. These side effects are usually seen at doses higher than 200 mCi. Since the number of patients with these characteristics is limited in our patient cohort, this evaluation could not be made. However, the effect of RIT on patient quality of life can be investigated by using quality of life assessment questionnaires specific to differentiated thyroid cancer and a larger patient cohort.

We believe that the negative statements they heard during patient information about the patient's prognosis and the frequent examinations and treatment interventions increased the anxiety of the patients. Providing patients with sufficient and accurate information from healthcare professionals and good communication between the patient and the healthcare team reduce the anxiety levels of patients

and increase their quality of life (26). Psychological and behavioral interventions have also been shown to improve patients' quality of life and reduce depression and anxiety (27,28).

We also investigated the relationship between treatment duration and anxiety levels in our study. The analysis revealed a weak positive correlation between treatment duration and the Beck Anxiety Score; however, this correlation was not statistically significant. Furthermore, the relatively small sample size of this study and the assessment of anxiety levels using only the Beck Anxiety Inventory may have prevented a clearer understanding of this relationships. In future studies, examining the relationship between treatment duration, age, sex, marital status, the presence of metastasis, time since diagnosis, whether they received RIT, and the dose of radioactive iodine they received and anxiety in larger samples and using different anxiety measurement tools would be beneficial.

This study has several limitations. First, the questionnaire is a subjective assessment and may be relatively affected by other psychosocial and environmental characteristics of individuals other than the disease. Furthermore, a clinical psychiatric evaluation was not performed on the patients; therefore, it cannot be determined for certain whether the anxiety symptoms stemmed from another psychiatric condition.

CONCLUSION

In conclusion, anxiety levels were found to be significantly greater in women with DTC than in men. Although the difference was not statistically significant, patients who did not receive radioactive iodine treatment had lower anxiety levels, whereas patients who received high-dose radioactive treatment had higher anxiety levels. Adequately explaining DTC, a disease with a good prognosis, to patients and stating that treatment methods that increase patients' anxiety, such as chemotherapy and radiotherapy, are not frequently used in this disease will help reduce patients' anxiety levels. When necessary, evaluation of DTC patients with high anxiety levels by a psychiatrist will increase the benefit that patients will receive from treatment.

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