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FACTORS OF AFFECTING SLEEP QUALITY IN CANCER PATIENTS

Kanser Hastalarında Uyku Kalitesini Etkileyen Faktörler

Nilay Sengul SAMANCİ[1], Emir CELİK[1], Ezgi DEGERLİ[1], Melih KASAP [2], Kerem ORUC[1], Sahin BEDİR [1], Sumeyra DERİN[1], Nihan SENTURK OZTAS [1], Burc Cagrı POYRAZ[3], Zeynep Hande TURNA[1], Fuat Hulusi DEMİRELLİ[1]

[1]Istanbul University Cerrahpasa Medical Faculty, Medical Oncology, Istanbul, TURKEY.
[2]Istanbul University Cerrahpasa Medical Faculty, Department of Internal Medicine, Istanbul, TURKEY
[3]Istanbul University Cerrahpasa Medical Faculty, Department of Psychiatry, Istanbul, TURKEY

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and ethical approval from Istanbul University Cerrahpaşa Hospital was was obtained. Protocol number of the ethical approval is 08/02/2019-22520.

Abstract

Aim: Sleep disorders are one of the most common problems in patients with malignancy and they severely decrease the quality of life. We sought to investigate the frequency of sleep disturbances, its quantity, quality and possible correlation with related factors such as depression and anxiety.

Materials and Methods: 150 patients participated and the Pittsburgh Sleep Quality Index was used to evaluate the sleep quality. It is a self-administered questionnaire and standardized measure of sleep quality. Total score of ≥5 shows that the quality of sleep is remarkably bad. Also a self-report measure of depression, the Beck Depression Inventory (BDI); and a self-report measure of anxiety, Beck Anxiety Inventory (BAI) were used.

Results: Of the 150 patients, 74.0% has bad sleep quality (score >5). Mean PSQI total score was 7.34 (min 0-max 20). No differences were found between PSQI mean scores in terms of gender, radiotherapy (RT), chemotherapy (CHT), having chronic disease or having metastatic disease. NSAIDs and opioids were significantly correlated with PSQI ($p<0.001$). PSQI total scores are strongly associated with the BDI score ($r=.424$, $p<0.001$) and BAI score ($r=.417$, $p<0.001$).

Conclusion: We found a high prevalence rate of bad sleep quality at 74%. Effective sleep treatment and psychological support should be provided in oncology clinics.

Keywords: Beck depression inventory, cancer, Pittsburgh sleep quality index, sleep disorders.

Öz

Amaç: Uyku bozuklukları malignitesi olan hastalarda en sık karşılaşılan sorunlardan biridir ve yaşam kalitesini ciddi şekilde azaltır. Bu yazıda, kanser hastalarında uyku bozukluklarının sıklığını, miktarını, kalitesini, depresyon ve anksiyete gibi ilişkili faktörlerle olası korelasyonunu araştırmaya çalıştık.

Materyal ve Metot: Uyku kalitesini değerlendirmek için 150 hasta katıldı ve Pittsburgh Uyku Kalitesi İndeksi anketi kullanıldı. Bu anket kendi kendine uygulanan ve uyku kalitesinin standartlaştırılmış bir ölçüsüdür. Toplam ≥5 skoru uyku kalitesinin oldukça kötü olduğunu göstermektedir. Ayrıca depresyonun bir öz bildirim ölçüsü olan Beck Depresyon Envanteri (BDI); ve kaygı özgeçmiş ölçüsü Beck Anksiyete Envanteri (BAI) kullanıldı.

Bulgular: 150 hastanın% 74.0'ında uyku kalitesi kötü idi (skor> 5). Ortalama PSQI toplam skoru 7.34 (min. 0-max 20) idi. PSQI ortalama skorları arasında cinsiyet, radyoterapi (RT), kemoterapi (CHT), kronik hastalığı olan veya metastatik hastalığı olanlarda fark bulunmadı. NSAID'ler ve opioidler PSQI ile anlamlı korelasyon gösterdi ($p <0.001$). PSQI toplam skorları BDI skoru ($r = .424$, $p <0.001$) ve BAI skoru ($r = .417$, $p <0.001$) ile güçlü bir şekilde ilişkili bulundu.

Sonuç: Sonuç olarak % 74 oranında yüksek bir kötü uyku kalitesi prevalans oranı bulduk. Bu da onkoloji kliniklerinde etkili uyku tedavisi ve psikolojik destek sağlanması gerektiğini ortaya koymaktadır

Anahtar Kelimeler: Beck depresyon envanteri, Pittsburgh uyku kalitesi endeksi, uyku bozuklukları.

INTRODUCTION

Sleep quality affects quality of life in both healthy people and patients. Cancer itself, cancer treatment, side effects of drugs and other aspects of the disease usually result in sleep disorders. Patients with

Corresponding Author / Sorumlu Yazar:

Sengul SAMANCİ
Adres: Istanbul Universitesi-Cerrahpasa Cerrahpasa Tip Fakultesi Yerleskesi Kocamustafapasa Cd. No:53 Cerrahpasa 34098 Fatih/Istanbul /TÜRKİYE.
E-posta: nilaysengulsamanci@gmail.com

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cancer are often reported to have sleep disorders[1]. It can be observed at any stage after diagnosis of cancer. Its pathophysiology is unknown, but there are many possible causes. Unlike other cancer related psychological factors, cancer-related sleep disturbances have received little attention. Bad sleep quality may lead to psychiatric disorders such as anxiety and depression[1].

Patients with cancer have worse sleep quality than healthy subjects. Predisposing factors of sleep disorders are prior sleep history, sex, age, weight[2]. There are different quantitative and subjective sleep assessment techniques, of which only a few can be used to assess sleep quality and disorders in patients with cancer. The Pittsburgh Sleep Quality Index (PSQI) is one them used in cancer patients Turkish validation was done by Ağargün et a.[3,4]. PSQI is a self-administered questionnaire for different classes of patients, such as cancer patients who evaluate several aspects of sleep[5]. In this prospective study we aimed to evaluate prevalence, quantity and quality of sleep disorders and the possible correlation with related factors, such as taking active chemotherapy and radiotherapy or using opioid dugs and NSAİDs, and its correlation with depression and anxiety in cancer patients.

MATERIALS AND METHODS

This study was performed in the Istanbul University-Cerrahpasa, Cerrahpasa Medical School Department of Medical Oncology. The study was approved by the institutional review board and informed written consent was obtained from each patient. Between January and May 2019, 175 patients were screened for eligibility. Finally, 150 patients were included in the study group.

Patients with pathologically confirmed cancer diagnosis, older than 18, and with Eastern Cooperative Oncology Group (ECOG) score of 0 or 1 were included. Patients with drug addiction, psychotic diseases, with cognitive impairments and with ECOG score of 2,3,4 were excluded. To determine performance status of patients, we used the ECOG score (0: best performance, 4: worst performance)[6]. Stage 1 and 2 disease were classified as early stage, stage 3 disease was locally advanced and stage 4 disease was classified as advanced stage.

PSQI was used to estimate the sleep quality. It is a self-administered questionnaire and it is a standard sleep quality measurement commonly used in sleep research. It has 19 questions consisting of : subjective quality of sleep, sleep latency, duration, habitual efficiency of sleep, sleep disturbances, sleep medication usage and day-time dysfunction. PSQI global score is evaluated between 0 to 21 points. Higher PSQI score shows bad quality of sleep. Total score equal to 5 or higher shows bad sleep quality. PSQI has a sensitivity of 89.6% and specificity of 86.5% [7].

According to Beck Depression Inventory (BDI), 11-16 points were determined as mild depression, 17-20 points borderline, 21-30 points moderate, 31-40 points were determined as severe depression and over 40 was determined as extreme depression [8].

For measuring patients' anxiety symptoms we used Beck Anxiety Inventory (BAI). In BAI scale; 0-9 points are considered no anxiety, 10-18 points are considered to be mild anxiety, 19-29 points are considered to be moderate anxiety and 30-63 points are considered to be serious anxiety [9].

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Commercial software (SPSS version 16.0®, SPSS, Chicago IL, USA) was used for the statistical analysis. The Kolmogorov– Smirnov test was used to analyze the normal distribution of data. Independent comparisons between two groups were performed with Student t test or Mann-Whitney U test. Spearman's correlation was used to evaluate the associations between sleep quality and other parameters. For the PSQI scores, univariate analyses were performed for the following independent variables: gender, metastasis, receiving CHT, receiving RT, opioid use, NSAID use, chronic disease. One way Anova was used to determine the associations between a continuous dependent variable with more that two categories of an independent variable. $p < 0.05$ was accepted as statistically significant.

RESULTS

Descriptive statistics

175 patients were screened for eligibility. Twenty-five patients refused to participate in the study due to lack of interest. Finally, the study consisted of 150 participants. Of the 150 patients, 98 (65.3%) were female and 52 (34.7%) were male. The median age was 58 , the mean age was 56.2 (Min 26-max84). The distribution of cancer diagnosis was as follows: 25.3 % gastrointestinal system (GIS), 28% breast cancer, 7.3% lung cancer, 16.0% gynecological cancer, 6.7% genitourinary cancer and 16.7% other cancers. Demographic and clinical parameters are shown in Table 1. The educational status of patients was 57.3% primary school, 18% high school and 24.7 %university. 34.7% of patients have a history of chronic illness, 22% have hypertension, 8 %have diabetes mellitus, 6.7 %have ischaemic heart disease, 3,3% chronic obstructive lung disease. And 16.7% patients were using anti-depressant drugs. Patients were divided into two groups: younger than 65 years (n=108) and older than 65 (n=42). There was no difference between the two groups in PSQI score (p=0.875). Sleep quality of 111 (74.0%) of patients was bad (global score >5). Mean PSQI total score was 7.34 (min 0-max 20).

Univariate analysis

Table 2 shows comparison between the PSQI total scores and categorical characteristics. In terms of PSQI scores there was no difference between male and female patients. There is no difference in terms of PSQI score between radiotherapy and those who did not, chemotherapy and those who did not, and those with and without chronic disease. NSAIDs and opioids were the strongest correlation variable associated with the PSQI (p<0005).

One-way Anova test was done if there was any difference between family status and between cancer types in terms of PSQI score. There was no difference between family status (p=0.50) and between cancer types in terms of PSQI score (p=0.88).

Table 3 shows the relationship between PSQI total score and depression, anxiety. PSQI total scores are strongly correlated with the assessed variables. Global sleep quality (PSQI) moderately correlated with BDI score (r=.424 p<0.001) and BAI score (r=.417, p<0.001). The mean BDI score was 16.14

(min 0- max 47), the mean BAI score was 13.70 (min 0- max56). 10.7 % patients were catagorized as “severe depression”, and 15,7 % patients were categorized as “severe anxiety”.

Table 1. Demographic and clinical characteristics of the patients

Age in years [mean (range)]	56.2 (26-84)
Gender [n (%)]	
Male	52 (34.7
Female	98 (65.3)
Cancer type[n (%)]	
Lung cancer	11 (7.3)
Breast cancer	42 (28)
Gastrointestinal cancer	38 (25.3)
Genitourinary cancer	10 (6.7)
Gynecological cancer	24 (16)
Other	25 (16.7)
Family status [n (%)]	
Married	125 (83.3)
Unmarried	19 (12.7)
Divorced	6 (4)
Metastasis [n (%)]	
No	59 (39.3)
Yes	91 (60.7)
Current Chemotherapy [n (%)]	
No	50 (33.3)
Yes	100 (66.7)
Current Radiotherapy [n (%)]	
No	9 (6.0)
Yes	141 (94.0)
Opioids [n (%)]	
Yes	24 (16.0)
No	126 (84.0)
Nsaid [n (%)]	
Yes	61 (40.7)
No	89 (59.3)
Metastasis location	
Bone	29 (19.3)
Liver	32 (21.3)
Lung	19 (12.7)
Brain	2 (1.3)

Table 2. Comparison between the PSQI total scores and categorical characteristics

	PSQI total score		
	Mean	**S.D**	**P**
Gender:			
Female	7.26	3.94	0.742
Male	7.50	4.49	
Metastatic disease:			
Yes:	7.84	4.22	0.066
No:	6.57	3.88	
Receiving chemotherapy:			
Yes:	7.66	4.12	0.190
No:	6.72	4.11	
Receiving radiotherapy:			
Yes:	9.66	4.76	0.082
No:	7.19	4.06	
Opioid:			
Yes:	11.12	4.88	0.000
No:	6.62	3.56	
Nsaid:			
Yes:	8.50	4.10	0.004
No:	6.55	3.97	
Chronic disease:			
Yes:	7.78	4.62	0.342
No:	7.11	3.84	

r : Spearman correlation coefficient

Table 3. Correlation between the PSQI (total score), Beck Depression Inventory (BDI), Beck anxiety Inventory (BAI)

		BDI	**BAI**
PSQI total score	**Correlation Coefficient (r)**	,424	,417
	p	,000	,000

r : Spearman correlation coefficient

DISCUSSION

It is very important to investigate the factors affecting sleep in patients with cancer. Savard et al. suggest that in patients with cancer, the prevalence of sleep disorders is twice that of the population [10]. In our study, the mean total PSQI score of our patients (7.34) was consistent with the study of Carpenter et al. [11].

In addition, most patients (74%) had significant sleep deficits and they were classified as bad sleepers. Although the high frequency of sleep problems, most of patients (88.7%) had not received any sleeping medication a month before entering the study, similar to the study of Forter et al. [12].

Despite this high frequency of sleep problems, only 12.7 % patients defined their subjective sleep quality as “very bad” and only 22.7 % of them defined as “fairly bad”.

Previous studies have shown that sleep disorders are particularly common in women with cancer. But, in this paper, gender was not correlated with sleep quality. Josée Savard et al reported taht being a woman is one of predisposing factors of insomnia [13]. Also, there was no difference between PSQI mean scores in terms of family status

Aging is associated with changes in sleep architecture. Older people usually experience more frequent nighttime excitements, awakenings and changes in the sleep stage [14]. Many studies focus on old age and sleep, like Byles and his friends, in their studies many older women think that less sleep is normal with increasing age[15]. According to our study, there was no difference between the PSQI and age.

Few studies show that sleep disorders and their prevalence have been shown to vary according to the type of cancer. Judith R Davidson et al. showed in their study that lung cancer patients have the highest ranking by prevalence for sleep disorders [16]. In this study, there was no difference in the sleep quality scores based on the cancer type. In the study of Sebastiano Mercadante and friends, there was no difference between cancer types in terms of sleep disorders like our study [17].

It seemed also that patients taking opioids and NSAIDs had more sleep problems than those who don’t take opioids or NSAIDs ($p<0.005$). This may be due to the fact that cancer-related sleep disturbance is caused by pain itself; or medications used to treat pain may aggravate sleep disturbance. Additionally, using opioids can cause various side effects, that may worsen the quality of sleep and also using NSAIDs may have acute negative effects on sleep in humans [18,19].

Many studies have established relationship between depression and insomnia [20]. Incidence of depression is significantly higher in patients with insomnia than patients without this condition [21]. Similarly, the results of this study showed correlation between sleep quality and depression and also between anxiety.

One limitation of this study is unable to discuss about performance status. In order to get a homogeneous group, we only got the ECOG performance score 0 and 1 patients. Therefore we were unable to comment on the correlation between performance and sleep quality.

Bad sleep quality has a negative impact on quality of life and increases the symptom burden. It causes anxiety in patients directly and indirectly. It has impact on patients with cancer' both physical and psychological functions [22]. If sleep disorders unmanaged, hospitalization and medical consultation will increase and, as a result, costs for the health-care system will increase. Also the management is difficult because there is not enough standardized definitions and guidelines for the physician. Consequently, we determined a high prevalence rate of bad sleep quality at 74%. During cancer treatment, it is important to evaluate and treat patients for insomnia.

In conclusion, sleep disturbance is a commonly encountered problem in cancer patients. Sleep disturbance can evolve into a chronic problem that negatively affects the patient's quality of life. In our study, we found that sleep quality was worse in NSAIDs and opioid users. Sleep disorder treatment needs to be incorporated into the daily pain control procedure. We hope that future studies will evaluate the causes of sleep disorders, their pharmacological or pharmacological treatments, and their effects on other aspects of quality of life using appropriate measurement methods. It seems that effective psychotherapy and sleep therapy should be provided in oncology clinics.

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