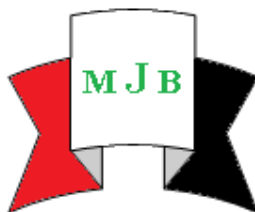


Assessment of Fatigue in Brain Cancer Patients Treated with Chemotherapy

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Abstract

A descriptive study aimed to evaluate the extent of fatigue in brain cancer patients treated with chemotherapy treatment and factors associated with fatigue. To fulfill these study 100 patients were gathered from the outpatient clinic for chemotherapy administration from 1st of Nov 2013 to the end Feb2014 in Radiation and Nuclear Medicine hospital Fatigue Symptoms Inventory (FSI) scale was used for assessment of fatigue contains four subscales (severity, interference with daily activity, frequency and diurnal). The result of this study declared that the highest total mean score of fatigue subscale was (4.54 $\pm$ 2.50) for frequency of fatigue in last week, followed by a high mean score of fatigue (4.42 $\pm$ 2.86) for the subscale of fatigue interference with activity for the past week, while the lowest mean score was for the daily pattern of fatigue (2.93 $\pm$ 1.33). Concerning the fatigue severity, the highest percentage (36%) of patients had moderate fatigue. In conclusion, fatigue is a significant problem for patients with brain cancer who had received chemotherapy although its severity is relatively different according to various variables.

The study recommended for further research with large number of patients to investigate incidence, pattern and severity of symptoms and also examine the functional status impairment in those patients under chemotherapy treatment.

KeyWords: Brain Cancer, fatigue, chemotherapy.

الخلاصة :

دراسة وصفية تهدف الى تقييم مدى التعب عند مرضى السرطان المعالجين بالعلاج الكيماوي والعوامل المصاحبة للتعب . ولاتمام هذه الدراسة جرى جمع ١٠٠ مريض من العيادة الخارجية لمستشفى الطب والاشعاع النووي في بغداد للفترة من بداية شهر ١١ - ٢٠١٣ الى نهاية شهر ٢ - ٢٠١٤ حيث جرى استعمال مقياس (اعراض التعب المخزون) لتقييم مدى التعب عند هؤلاء المرضى. وقد اوضحت النتائج بان التعب يحصل وبذلالة معنوية عالية في الاسبوع الاخير من تلقي العلاج بالتزامن مع الفعاليات للاسبوع الذي قبله بينما المتوسط الحسابي الواطئ كان للنمط التعب اليومي للمرضى. وفيما يتعلق بشدة التعب كانت النسبة ٣٦% للمرضى اللذين لديهم تعب متوسط . استنتجت الدراسة بان التعب مشكلة كبيرة لمرضى سرطان الدماغ واللذين تلقوا العلاج الكيماوي على الرغم من ان حدته تختلف نسبيا باختلاف المتغيرات المختلفة. كما واوصت الدراسة بضرورة اجراء بحوث اخرى بعدد اكبر من عينة البحث (المرضى) للكشف عن الاحصائيات والنمط وشدة اعراض التعب لدى مرضى سرطان الدماغ بالاضافة الى فحص حالة العوق الوظيفي لدى هؤلاء المرضى وللذين هم تحت العلاج الكيماوي .

Introduction

Cancers of the brain are the consequence of abnormal growths of cells in the brain. Brain cancers can arise from primary brain cells, the cells that form other brain components (for example, membranes, blood vessels), or from the growth of cancer cells that develop in other organs and that have spread to the brain by the bloodstream. (1)

In the United States, primary brain cancer and other nervous system cancers are

estimated to develop in about 22,000 people in 2010, according to the National Cancer Institute. (2)

Fatigue is a subjective sensation with physical, cognitive, and affective modes of expression. The etiology is often unclear and multiple potential etiologic factors for fatigue may coexist. It also involves characterizing its severity, temporal features, exacerbating and relieving factors, and associated distress. Fatigue is the most common and disturbing complaint reported

by women during adjuvant brain cancer chemotherapy, but little is known about the mechanisms influencing it (1).

Fatigue is difficult to describe, and the people with cancer may express it such as, saying they feel tired, weak, exhausted worry, and worn out. Several definitions are used to describe cancer-related fatigue, it is defined by the National Comprehensive Cancer Network (NCCN) as "a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning" [9].

Fatigue is one of many symptoms seen in patients with brain cancer and both clinical experience and clinical studies declared that it was one of the most common unrelieved symptoms of cancer treatment [5]. Potential factors contributing to fatigue in cancer patients are the cancer itself, cancer treatment, cancer or treatment complications, medications and other management.(11)

Many studies examined the prevalence of fatigue among brain cancer patients they found that about 99 % of patients were experienced some level of fatigue during the course of chemotherapy treatment and more than 60% were rated their level of fatigue as moderate to severe {6.20}.(20)

Because there are so many causes of fatigue, there's no one medicine that can relieve fatigue. However, fatigue from treatment can appear suddenly, at any time, and can be overwhelming. Rest doesn't ease fatigue and it can last for months after treatment ends [8, 9]. Moreover, fatigue may become very important issue in the life of a patient with brain cancer and affects her/ his daily activities and relationships with others, patient may miss work, withdraw friends, and not able to think clearly. Therefore, understanding the extent of fatigue and its causes is important in determining effective management and helping patients to cope with fatigue [11, 12]

The majority of researches were conducted in America and European countries, little is known about fatigue for brain cancer patients in Iraq, therefore this study attempts to identify the extent of fatigue

related to brain cancer in patients who were under chemotherapy treatment.

Materials and Methods:

Study Design & Setting:

A descriptive design was carried out on patients fulfilling the criteria of the study, during the period of 1st of Nov 2013 – 28th of Feb 2014. They were chosen from the outpatient clinic in Radiation and Nuclear Medicine hospital in Baghdad.

Subjects: The sample consisted of all patients having a current diagnosis for stage 2 or 3 of brain cancer and under chemotherapy treatment (receiving three or more cycles) because patients who received first cycle of treatment had lower scores of fatigue than the patients who had 3 cycles of treatment.

The exclusion criteria were: recurrence of cancer, other malignancy, and cancer diagnosis less than 3 months, chronic disease (hypertension and/or diabetes mellitus).

The Fatigue inventory scale (FSI) is multidimensional scale, besides assessing the fatigue symptoms; also try to evaluate the quality of life. (FSI) was found easy and useful tool in assessing the impact and duration of fatigue. It was translated to Arabic and the translation was applied to healthy subjects for evaluation.

The score range from 0-10, where 0 represent "no fatigue" and 10 denoted "a high rank of fatigue."

"The FSI is 14-item measures that assess the severity, frequency, and diurnal variation of fatigue, as well as it perceived interference with quality of life. Severity is measured using four separated items that assess most, least, and average fatigue in the past week as well as current fatigue.

Frequency is measured using two separate items that assess the number of days in the past week that respondents felt fatigued as well the portion of each day on average they felt fatigued.

Statistical Considerations: The statistical analysis was performed by using Statistical Packages for Social Sciences (SPSS), version 13. The information were first analyzed with descriptive methods: number,

frequency and distributions were studied. ANOVA and Chi-square tests were used to analyze the relationships between variables.

P-values less 0.05 were interpreted as statistically significant.

Results

Table 1: Mean and standard deviation of fatigue subscales in the study population

Items of Fatigue Scale	Mean $\pm$ SD.
Severity of fatigue in past week:	
Most fatigue past week	5.40 $\pm$ 3.12
Least fatigue past week	3.52 $\pm$ 2.53
Average fatigue past week	4.43 $\pm$ 2.54
Fatigue now	3.29 $\pm$ 3.08
Total	4.16 $\pm$ 2.14
Ability to bath & dress yourself	3.40 $\pm$ 3.34
Normal work activity	4.68 $\pm$ 3.14
Ability to concentrate	3.89 $\pm$ 3.36
Relation with other	3.84 $\pm$ 3.47
Enjoyment of life	4.67 $\pm$ 3.46
Interfered with your mood	5.23 $\pm$ 3.19
Total	4.42 $\pm$ 2.86
Frequency of fatigue in past week:	
How many days (past weeks) you felt fatigue	4.30 $\pm$ 2.20
How much of the day(past week) you felt fatigue	4.77 $\pm$ 3.23
Total	4.54 $\pm$ 2.50
Daily pattern of fatigue (Diurnal)	2.93 $\pm$ 1.33

Table (1) represents the rating of fatigue severity, interference of fatigue with activity, frequency and diurnal variation of fatigue. The highest total mean score of fatigue subscale (4.54 $\pm$ 2.50) was for frequency of fatigue in last week, followed by a total

mean score of fatigue (4.42 $\pm$ 2.86) for the subscale of fatigue interference with activity in the past week which caused impairment in quality of life in the study group, however, the lowest mean score (2.93 $\pm$ 1.335) was for the daily pattern of fatigue (diurnal).

Table 2: Relation of fatigue subscales with socio-demographic data of study population

Variables	Mean $\pm$ SD of Fatigue Subscales			
	Severity	Interference	Frequency	Diurnal
Age(years)				
30 – (n= 19)	3.59 $\pm$ 2.05	3.51 $\pm$ 3.15	3.27 $\pm$ 2.53	2.83 $\pm$ 1.33
40- (n= 33)	4.85 $\pm$ 1.77	5.35 $\pm$ 2.35	4.98 $\pm$ 2.21	2.90 $\pm$ 1.37
50- (n= 31)	3.79 $\pm$ 2.41	4.10 $\pm$ 3.06	4.50 $\pm$ 2.45	2.87 $\pm$ 1.33
60- (n= 17)	4.51 $\pm$ 1.81	4.20 $\pm$ 2.67	5.42 $\pm$ 2.39	3.28 $\pm$ 1.20
Sig. Test	P=0.06	P=0.28	P= 0.07	P= 0.80
Marital status:				
Married (n= 65)	4.28 $\pm$ 2.03	4.14 $\pm$ 2.68	4.66 $\pm$ 2.42	3.18 $\pm$ 1.18
Single (n= 24)	3.19 $\pm$ 1.96	4.31 $\pm$ 3.13	3.68 $\pm$ 2.57	2.16 $\pm$ 1.49

Divorced (n= 11)	5.52 ± 2.39	6.28 ± 2.89	5.63 ± 2.45	3.09 ± 1.30
Sig. Test	P= 0.08*	P= 0.07	P= 0.07	P= 0.005*
Financial status:				
Poor& Middle (n= 62)	4.45 ± 1.93	4.77 ± 2.79	4.98 ± 2.51	2.91 ± 1.41
Good (n= 34)	3.70 ± 2.24	3.86 ± 2.65	3.76 ± 2.26	2.85 ± 1.25
Very good (n= 4)	2.37 ± 2.55	2.50 ± 4.33	3.37 ± 2.68	3.50 ± 0.57
Sig. Test	P= 0.02*	P= 0.06	P=0.05*	P=0.69
Duration of Disease				
<1 year (n= 26)	3.37 ± 2.05	3.20 ± 2.69	3.25 ± 2.80	2.54 ± 1.58
1 –5 years (n= 12)	4.19 ± 1.86	4.44 ± 2.72	4.71 ± 2.28	2.94 ± 1.26
≥ five years (n= 62)	4.92 ± 2.63	5.67 ± 2.95	5.50 ± 2.21	3.31 ± 1.12
Sig. Test	P=0.04*	P=0.01**	P=0.00**	P=0.14

* Significant

** Highly Significant

Table (2) shows that most of the patients' ages were more than 40 years old, followed by the group 50 years old. In addition less than two thirds (65%) of the studied group were married with poor /middle financial status (62%). The same table also declares

the correlations between characteristics of the study participants and fatigue subscales. It indicates that significant relation between fatigue subscales (severity of fatigue & diurnal) and marital status ($p=0.08$ & $p=0.05$ respectively).

Table 3: Fatigue severity and physical symptoms

Physical Symptoms	Fatigue Severity		
	Mild 32%	Moderate 36 %	Sever 32%
Pain (n= 63)	15	27	21
Vomiting (n = 45)	16	14	15
Nausea (n= 79)	23	30	26
General weakness (n= 39)	8	17	14
Weakness (n=86)	23	33	*30
Soreness of the mouth (n= 65)	17	29	*19
Dyspnea (n=53)	13	20	20
Diarrhea (n=43)	10	18	15

* Significant

Table (3) shows that there were significant relation between the duration of disease and the fatigue subscales (severity, fatigue interference with daily activity and frequency) ($P=0.04$, $p=0.01$ & $p= 0.00$ respectively).

Regarding the fatigue severity, the highest percentages (36%) of patients had moderate fatigue; however, an equal percentage of 32% was found for mild and severe fatigue. In addition there were (30) patients who had physical symptoms "weakness" suffered from severe fatigue, while the lowest number of patients (14) suffering from general weakness.

Discussion

Fatigue is a common distressing problem in most brain cancer patients. It may be caused by the disease, the complications of the disease and its treatments.

The current study carried out on patients receiving chemotherapy in the outpatient clinic has verified that fatigue is a common complaint among patients with brain cancer. Fatigue is a common consequence of cancer chemotherapy and it is a symptom with several etiological factors related to the disease and its treatment.

Furthermore, fatigued patients are less physically active, less able to participate in enjoyable activities with increased weakness, in addition, fatigue may be indicators of tiredness, such as reduced energy expenditure, sleep disturbance, decreased endurance, and weakness.

The study sample consisting of 100 patients experienced fatigue according to the FSI (table 1). The highest total mean score was for frequency of fatigue, which indicated that the patients were complaining from fatigue during the last week; followed by the subscale fatigue interference with daily activity. This finding is in agreement with many previous studies (13) which stated that patients who received chemotherapy reported that fatigue has a major effect on their quality of life.

The present study showed in table (2) that a significant relationship between subjects' demographic characteristics such as, marital status and financial difficulties, and

fatigue. This is in consistence with earlier studies (13).

Fatigue like pain is a subjective symptom and hence varies from patient to another patient, and from time to time leads to physical restriction. In the current study fatigue severity was statistically associated with certain physical symptoms such as: pain, soreness of the mouth and also general weakness. The explanation could be that most patients with cancer experience pain and this could lead to many other physical complicated symptoms which may cause fatigue. (20)

When patients looking at the mirror, they think that they are ugly, undesirable, and the only thing they can see is the hair loss. Sometimes this can cause greater pain and fatigue than the fact that they are suffering from cancer [16, 17].

Fatigue prevented patients from living a normal life and being able to practice their daily routine. In the present study, there were statistically significant relations between pain, nausea, general weakness, diarrhea, dyspnea and fatigue (table 3). This finding is consistent with another study carried out on fatigue, pain and functional status (18). Siefert et al.(18) conducted a study on 147 cancer patients receiving cytotoxic drugs, using the FSI scale for assessment of fatigue, they found that there was a statistically significant correlation between pain, nausea and fatigue, and concluded that fatigue is a common side effect and affects quality of life negatively. In addition, Booker et al. (17) declared that a significant correlation between diarrhea and fatigue in a cross-section study on 119 random sample of Iranian patients with brain cancer. However, Suhage et al. (15) stated that general weakness could be a long-term effect of adjuvant therapy and have been previously reported as a significant factor related to fatigue.

Conclusions

Most patients with brain cancer suffered from fatigue, which was aggravated by chemotherapy treatment. The present study supported previous findings that fatigue in

brain cancer patients is a serious problem. The prevalence of fatigue in the current study highlights the importance of educating nurses and health personnel about assessment and management of fatigue. Nurses and clinicians, who care for brain cancer patients experiencing fatigue, must be aware of patients' socioeconomic status.

Recommendations

The study recommended for further research including conduct prospective design studies, with large number of patients to investigate incidence, pattern and severity of symptoms and also examine the functional status impairment in those patients under chemotherapy treatment. This might give better insight into the magnitude and management of fatigue in patients with brain cancer receiving chemotherapy treatment.

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