RESEARCH COMMUNICATION

Radiotherapy-related Tiredness in Patients with Glioblastoma Multiforme (GBM)

Arzu Tuna-Malak[1]*, Alev Dıramalı[2]

Abstract

Tiredness may be caused by the brain injury due to the tumor or the treatment in patients with glioblastoma multiforme (GBM). Some patients describe a sense of tiredness particularly after radiation or oral chemotherapy. To evaluate tiredness level of patients with GBM during preoperative, postoperative and radiotherapy we here eamined a sample of 38 patients. Data were collected over six months in a neurosurgery clinic. Patients assigned to Group I were given a booklet and information about radiotherapy, oral temozolomide and tiredness. Group II received only the booklet. The chi-squared test were used to determine differences in tiredness between Group I and Group II, with Spearman's correlation for post-radiotherapy results (3 and 6 months postoperative). In conclusion, the level of tiredness was assessed to be significantly better in Group I than in Group II. Levels of tiredness in patients with GBM were greatly affected by the radiotherapy and oral chemotherapy (temozolomide).

Key Words: Glioblastoma Multiforme - radiotherapy - tiredness

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Introduction

Glioblastoma multiforme (GBM) is the most common and most aggressive type of primary brain tumor, accounting for 50-60% of all primary brain tumor cases and 12-15% of all intracranial tumors.(Bruce et al., 2006). It is the highest grade glioma (grade 4) and is the most malignant form of astrocytoma. Treatment can involve surgery, radiotherapy, and chemotherapy, all of which are slowly increasing the survival time of patients diagnosed with glioblastoma (Brownstain and Stevenson, 2004). GBM patients generally have a dismal prognosis, with median survival of 10-12 months (Prabal et al., 2005). Postoperative radiotherapy is important therapy which increases median survival, but, by two years, 90% of patients are dead (Walker, Green, Byar et al 1980). Radiation therapy and temozolomide (an oral based chemotherapy agent) which are painless can be used together. However, it is common for some patients to note changes in sleep or rest patterns during the time they are receiving radiation therapy and many describe a sense of tiredness and fatigue. Patients taking steroids may also experience extreme tiredness. Following radiation, energy levels and other side effects will generally improve over 4-6 weeks but temporary return of tiredness and/or worsening of symptoms may occur 2-3 months after radiation (Brownstain and Stevenson, 2004, Do et al., 2000).

Tiredness is a common symptom in brain tumor patients. It is described as fatigue, weakness, exhaustion, lethargy, inability to concentrate, malaise, sleepiness and lack of motivation. Increased tirednes correlates with poor functioning and poor quality of life. In addition, tiredness may be present even beyond one year after diagnosis, whether or not the patient has received radiation therapy. Tiredness may be caused by the brain injury due to the tumor or the treatment. Some degree of fatigue may be a lifelong problem (Lovely, 2004). Same time, stress and worry in cancer increase the level of tiredness. Other mental health problems such as depression or anxiety can also exacerbate the condition (Janda et al., 2008).

Optimal prevention and management of this symptom may be provided by relaxation therapy, group psychotherapy, physical exercise and sleep (Jereczek-Fossa et al., 2002). On the other hand, anaemia can be seen a general problem in patient with GBM (Brownstain, Stevenson 2004). Treatment for anaemia is effective in reducing tiredness (Clark, 2001, Ahlberg et al., 2003).

The aim of the present study was to determine affects of interventions to decrease level of tiredness and evaluated tiredness level of patients with GBM with therapy.

Materials and Methods

The study sample consistes of 38 patients with GBM. Unfortunately, not all survived until the end of the research period. Twenty eight of all patient (73.7 %) lived

*[1]Çanakkale On Sekiz Marta University, School of Public Health, [5]Department of Preventive Medicine, Graduate School of Medical Sciences, Kyushu University, Fukuoka 812-8582, Japan *For correspondence: arzutunamalak@gmail.com*

for at least three months and 22 (57.9 %) for at least six months. Data were collected in six month in a neurosurgery clinic of university hospital in Turkey. Approval was obtained from an ethical committee. Characteristics of patients are summarized in Table 1.

Patients assigned into Group I were given a booklet and information about radiotherapy, oral temozolomide and tiredness. The booklet and information were associated with treatment for anaemia and behavioural interventions, such as, including energy control, relaxation therapy, group psychotherapy, physical exercise, sleep and nutrition. Group II were given only the booklet. All patients were asked to report their tiredness one, three and six months after brain surgery .

Generally, radiotherapy was started approximately 1 or 1,5 months after surgery. It consisted of conventional fractioned irradiation with a 2 Gy/fraction dose administered for 5 days a week over 6 weeks. 46 Gy was applied to the whole brain and an additional 20 Gy dose was applied to the tumor bed, resulting in a total dose of 66 Gy. A Co-60 unit was used for the treatment of all patients. In the temozolomide plus radiotherapy group, temozolomide was administered at a dose of 75 mg/m2/day for 7 days a week, starting from the first and continued to the last day of the radiotherapy with a maximum duration of 49 days. After a 4-week break, patients were administered a 6-cycle standard adjuvant temozolomide regimen which consisted of 150 mg/m2/day for 5 days in every 28 days.

Researchers are used a five-point Likert scale for level of tiredness in groups (1 = absence of - 5 = a great deal). The study demographic characteristics are summarized in Table 1. Chi-squared tests were used to determine differences in tiredness between Group I and Group II (Table 2). Spearman's Correlation was used effects of post-radiotherapy (3 and 6 months after surgery.

Table 1. Patient Characteristics

Characteristics	Total (38)	Group I (17)	Group II (21)
Sex			
Women	12 (31,6)	7 (41.2)	5 (23.8)
Men	26 (68.4)	7 (58.8)	16 (76.2
Education			
8 years	19 (50.0)	7 (41.2)	12 (57.1)
11 years	10 (26.3)	7 (41.2)	3 (14.3)
15 years	9 (23.7)	3 (17.6)	6 (28.6)
Age	54.2+11,0	53.2+12,8	55.0+9.7
Resection Type			
Total	11 (28.9)	7 (41.2)	4 (19.1)
Subtotal	27 (71.1)	10 (58.8)	17 (81.0)

Table 2. Levels of Tiredness in the Groups

Period	1	2	3	4	5	X^2	p value
Preoperative							
Group I	15	1	1	-	-	3,667	0.160**
Group II	13	6	2	-	-		
Total	28	7	3	-	-		
5-7 Days Postoperative							
Group I	-	5	12	-	-	0,315	0.575**
Group II	-	8	13	-	-		
Total	-	13	25	-	-		
1 Month Postoperative							
Group I	11	1	5	-	-	7,556	0.023*
Group II	7	5	9	-	-		
Total	18	6	14	-	-		
3 Months Postoperative							
Group I	10	1	-	1	10	15,410	0.001*
Group II	2	11	2	1	2		
Total	12	12	2	2	12		
6 Months Postoperative							
Group I	6	2	2	-	-	8,235	0.083**
Group II	1	7	2	1	1		
Total	7	9	4	1	1		

Results

There was no statistically difference between Group I and Group II in preoperative, 5-7 day after postoperative and 6 month after postoperative ($p > 0,05$). There was statistically significant between 1 and 3 month after postoperative ($p < 0,05$) (Table 2). There was a statistically significant ($p<0,05$), moderate relation between tiredness and radiotherapy with oral chemotherapy (temozolomide) ($n=28$, $r=0.613$, $p=0.002$) between three month and six months ($n=22$, $r=0.456$, $p=0.033$).

Discussion

Tiredness of patient with GBM occured during postoperative and radiotherapy. Knowledge of patient might decrease in level of tiredness (Brownstain, Stevenson 2004, Clark 2001). Giving education group tired level was decreased by intervention during six month. Other hand, there was no significant difference control group level of tired by the time. This research result showed that it was more important giving face to face preoperative information than booklet in control of tiredness (Table 2). When patients of Group I returned their home, they adapted giving suggests. The other important factor that increased level of tiredness was dose of radiotherapy. There was a positive relationship between dose of radiotherapy and level of tiredness, in line with earlier findings (Brownstain and Stevenson, 2004; Jereczek-Fossa et al., 2002). Hence, level of tiredness in patient inreased in 1.5 month after radiotherapy. Level of tiredness in 1,5 month after radiotherapy was higher than in 3 month after radiotherapy. And there was moderate relation between tiredness and radiotherapy with oral chemotherapy (temozolomide). Not only radiotherapy and temozolomide but also stress and anemia cause tiredness in these patients. Emotional condition and therapy of anemia might effect tiredness (Clark 2001). Unfotunately, this research didn't show result of anemia's therapy and emotional condition of patients.

In conclusion, level of tiredness was significantly better in Group I than in Group II. Level of tiredness in patients with GBM was affected by the radiotherapy and oral chemotherapy (temozolomide).

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