

# Gender Disparity in the Rate of Partner Abandonment in Patients With Serious Medical Illness

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**BACKGROUND:** Life-threatening illness creates severe stress that may result in marital discord, separation, or divorce and may adversely impact treatment, quality of life, and survival. The few studies that are available to date have suggested that the risk of divorce is not higher in cancer patients, but to the authors' knowledge, no data exist to date that have examined the effect of gender on this rate. **METHODS:** A total of 515 patients were prospectively identified as having either a malignant primary brain tumor (N = 214), a solid tumor with no nervous system involvement (N = 193), or multiple sclerosis (N = 108) who were married at the time of diagnosis. Basic demographic information and data regarding marital status were compiled. Patients were followed prospectively from enrollment until death or study termination. **RESULTS:** Women composed 53% of the patient population. Divorce or separation occurred at a rate similar to that reported in the literature (11.6%). There was, however, a greater than 6-fold increase in risk after diagnosis when the affected spouse was the woman (20.8% vs 2.9%;  $P < .001$ ). Female gender was found to be the strongest predictor of separation or divorce in each cohort. Marriage duration at the time of illness was also correlated with separation among brain tumor patients ( $P = .0001$ ). Patients with brain tumors who were divorced or separated were more likely to be hospitalized, and less likely to participate in a clinical trial, receive multiple treatment regimens, complete cranial irradiation, or die at home ( $P < .0001$ ). **CONCLUSIONS:** Female gender was found to be a strong predictor of partner abandonment in patients with serious medical illness. When divorce or separation occurred, quality of care and quality of life were adversely affected. **Cancer 2009;115:5237-42. © 2009 American Cancer Society.**

**KEY WORDS:** marital status, divorce, cancer, multiple sclerosis, brain tumor.

**The** diagnosis and subsequent treatment of cancer represent major life stressors that entail not only physical but also significant psychosocial consequences. Cancers that involve the central nervous system (CNS) are particularly stressful, because they are rarely curable and are usually accompanied by nervous system symptoms that impair cognitive as well as physical function.<sup>1-3</sup> These impairments can result in major

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**Received:** December 16, 2008; **Revised:** January 28, 2009; **Accepted:** January 30, 2009

Published online July 30, 2009 in Wiley InterScience (www.interscience.wiley.com)

**DOI:** 10.1002/cncr.24577, www.interscience.wiley.com

changes in the nature of the marital relationship, and may become significant enough to disrupt that relationship. Marital disruption may, in turn, adversely affect the quality of care, the quality of life, and the outcome of treatment for the affected partner.

In the relatively few studies published to date regarding this topic, the overall frequency of divorce does not appear to be increased in patients with cancer.<sup>4-12</sup> In our neuro-oncology practice, however, we were impressed by a striking gender asymmetry in the occurrence of divorce. Divorce appeared to occur almost exclusively when the wife was the disease-afflicted partner. To investigate this observation more formally, and to assess how divorce might alter treatment and treatment outcomes, we enrolled consecutive patients attending our neuro-oncology outpatient clinic into a prospective cohort study. We also enrolled 2 parallel comparison cohorts: 1 consisting of consecutive patients attending our general oncology clinic and 1 consisting of consecutive patients attending a multiple sclerosis (MS) clinic to attempt to separate the effects of oncologic and neurologic diagnoses.

## MATERIALS AND METHODS

Patients were enrolled and data prospectively collected from consecutive referrals to the neuro-oncology (M.J.G., M.C.C.), general oncology (M.J.G.), and MS (K.R.E.) clinics. Patients were sequestered from this initial study cohort if, at the time diagnosis, they were already widowed, divorced, had never married, or information regarding marital status was not available. To separate the effects of neurologic and oncologic illness on marital discord, we excluded cancer patients with CNS involvement and MS patients with cancer.

Demographic data were collected from the date of enrollment in 2001 through 2002 until the date of last follow-up on February 1, 2006. Both formal divorce and permanent separation lasting at least 3 months were accepted as endpoints for partner abandonment. Lesser degrees of marital discord were not accepted because of the potential for investigator bias.

The Wilcoxon rank sum test for continuous variables, and Fisher exact test for categorical variables were used to compare the distribution of demographic, disease, and treatment variables among the 191 patients with primary brain tumors who remained married throughout the study

period and the 23 patients who divorced or separated after the diagnosis of their brain tumors. A multivariate logistic regression model was used to assess the effects of sex (female vs male), age (<50 years vs ≥50 years), Karnofsky performance score (KPS), tumor location (frontal vs other), education (college or higher vs high school or less), and residence (rural or suburban vs city) on the risk of divorce. A 2-sided *P* value was calculated. A log-rank test was used to compare survival between these groups both for all 214 patients, and for the 146 patients with glioblastoma multiforme. A multivariate Cox proportional hazards regression analysis was used to assess the effects of marital status at the end of the study (divorced vs married), age (<50 years vs ≥50 years), sex (female vs male), KPS, tumor location (frontal vs others), education (college or higher vs high school or less), and residence (rural or suburban vs city) on overall survival. For all comparisons, a 2-sided *P* < .05 was considered statistically significant. Approval from the authors' Institutional Review Board was obtained before study initiation.

## RESULTS

A total of 515 married patients were initially entered into this study with either a malignant primary brain tumor (N = 214), cancer (N = 193), or MS (N = 108). Two hundred fifty-four patients (53%) were female.

Sixty (11.6%) marriages ended in either separation or divorce after the diagnosis of serious illness (median, 6 months; range, 1-14 months). This event was found to be significantly correlated with gender: 20.8% of relationships ended when the woman was the affected partner compared with only 2.9% when it was the man (*P* < .001, chi-square test). Stated another way, in 88% of the separations, the affected partner was the woman. This effect was present in each of the patient cohorts: women were the affected partner in 78%, 93%, and 96% of the primary brain tumor, general oncology, and MS cohort, respectively (Table 1). There also was a trend (*P* = .0624) (Table 2) toward an increased separation in patients with frontal lobe tumors that may reflect the concurrent neurobehavioral changes commonly observed in these patients.

To gain further insight into the cause and effects of this difference, we focused on the brain tumor cohort, because the rate of divorce was so high relative to the median follow-up time of 1.2 years. Using multivariate

**Table 1.** Frequency of Divorce in Females and Males With Primary Brain Tumors, Non-CNS Cancer, and Multiple Sclerosis

Disease	Patients Married at Time of Diagnosis	No. of Divorces			P
		Total	Female	Male	
Primary brain tumor	214	23	18 (78%)	5 (22%)	<.001
General oncology	193	14	13 (93%)	1 (7%)	.003
Multiple sclerosis	108	23	22 (96%)	1 (4%)	.06
Total	515	60	53 (88%)	7 (12%)	<.001

CNS indicates central nervous system.

**Table 2.** Multivariate Logistic Regression Analysis of Risk Factors for Separation in Patients Who Were Married at the Time of Primary Brain Tumor Diagnosis

Variable	OR (95% CI)	P
Sex (female vs male)	10.8 (3.25-36.0)	.0001
Age at diagnosis (<50 y vs ≥50 y)	6.33 (1.87-21.4)	.003
Location (frontal vs others)	0.35 (0.11-1.06)	.0624
Education (college or higher vs high school)	0.38 (0.12-1.22)	.1028
KPS	1.01 (0.97-1.06)	.5657
Residence (rural or suburb vs city)	0.71 (0.19-2.61)	.6058

OR indicates odds ratio; 95% CI, 95% confidence interval; KPS, Karnofsky performance score.

analysis to examine several variables in the 214 patients who were married at the time of brain tumor diagnosis, female gender remained by far the strongest associated variable, with an odds ratio (OR) of 10.8 ( $P < .001$ ). The only other measure examined that attained significance was age <50 years (OR, 6.33;  $P = .003$ ) (Table 2).

We next compared men and women in terms of several disease-related variables. No major differences were noted between the groups, although age ( $P < .05$ ) and percentage of patients with glioblastoma ( $P = .03$ ) were found to be marginally significant variables (Table 3). In contrast, when we performed a similar comparison between the group that stayed married versus those that were divorced, 2 variables were noted to be highly significant: age ( $P = .0003$ ) and length of partnership ( $P = .0001$ ) (Table 4). At the time of diagnosis, couples that stayed together had been married for  $27.4 \pm 15.4$  years compared with  $14.4 \pm 9.5$  years in those that separated. Of interest, there was no difference in the length of the

**Table 3.** Distribution of Demographic and Disease-Related Variables Between Males and Females Who Were Married at the Time of Primary Brain Tumor Diagnosis

Variable	Mean (SD) or No. (%)		P
	Men (n = 136)	Women (n = 78)	
GBM (%)	100 (73.5)	46 (59)	.03
Age, y	54.5 (14.5)	49.9 (14.5)	.05
KPS	76.3 (12.9)	77.6 (11.6)	.54
Marriage length, y	27 (16.0)	24 (14.2)	.25
<b>Education</b>			
High school	54 (45.8%)	32 (59.3%)	.14
College or higher education	64 (54.2%)	22 (40.7%)	

SD indicates standard deviation; GBM, glioblastoma multiforme; KPS, Karnofsky performance score.

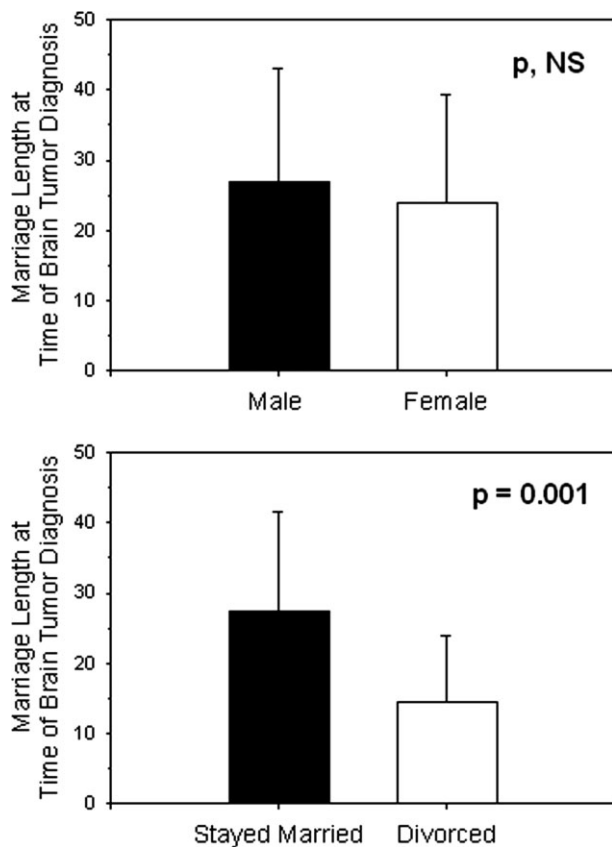
**Table 4.** Distribution of Demographic Variables Between Patients Who Divorced and Those Who Remained Married After the Diagnosis of a Primary Brain Tumor

Variable	Mean (SD) or No. (%)		P
	Kept Marriage After Diagnosis (n = 191)	Divorced After Diagnosis (n = 23)	
Marriage length, y	27.4 (15.4)	14.4 (9.5)	.0001
Age, y	54.1 (14.5)	42.5 (11.6)	.0003
GBM (%)	135 (70.7)	11 (47.8)	.05
KPS	76.4 (12.7)	80.0 (10.4)	.20

SD indicates standard deviation; GBM, glioblastoma multiforme; KPS, Karnofsky performance score.

partnership noted between men and women (Fig. 1). We interpret this to mean that, along with gender, marriage duration plays an important, most likely inter-related role in whether separation occurs after diagnosis.

To address the effects of separation on quality of life, we also determined the effect of partner abandonment on outcome by assessing the rate by which several adverse clinical outcomes occurred (Table 5). Compared with patients who stayed together, separated patients fared more poorly, with a greater use of antidepressants, less participation in clinical trials, more frequent hospitalizations, fewer salvage treatment regimens, and less likelihood of completing radiotherapy or dying at home ( $P < .0001$  for all comparisons).



**FIGURE 1.** Marriage length in brain tumor cohort as a function of gender (left) and whether the marriage survived the brain tumor diagnosis (left panel) is shown. Although the length of the marriage was nearly the same between men and women, a marked difference was noted when those who stayed married were compared with those who separated ( $P = .001$ ) (right panel). NS indicates not significant.

## DISCUSSION

Mortality is reported to be reduced in patients with cancer when those patients have strong social and community networks.<sup>13,14</sup> Although many community resources and family members can serve important caregiving roles, the presence of a dedicated spouse may be the most important component of strong social support. Not surprisingly, therefore, most studies have supported the hypothesis that all-cause mortality, cancer-specific mortality, and quality of life are better in married than unmarried cancer patients across many different tumor types,<sup>15-23</sup> including primary brain tumors.<sup>24-26</sup> This information is important for counseling patients, marshalling resources, and designing clinical trials. However, from a practical standpoint, unmarried status at the time of cancer diagnosis is not

**Table 5.** Comparison of Treatment and Treatment Outcomes Between Patients Who Divorced and Those Who Remained Married After the Diagnosis of a Primary Brain Tumor

Variable	No. (%) or Median (Days)		P
	Stayed Married After Diagnosis (n = 191)	Divorced After Diagnosis (n = 23)	
Use of antidepressants	20 (10.5)	22 (95.6)	<.0001
Participation in clinical trials	176 (92.2)	15 (65.2)	<.0001
≥2 Hospitalizations	8 (4.2)	22 (95.6)	<.0001
≥3 Treatment regimens	112 (58.6)	1 (4.4)	<.0001
Completion of radiotherapy	186 (97.4)	17 (73.9)	<.0001
Died at home	127 (76.5)	4 (20)	<.0001

amenable to intervention. Preventing partner abandonment should, however, be possible. A first step toward this goal is identifying risk factors for divorce and separation. To our knowledge to date, very little information is available on this subject for patients with chronic medical illnesses such as cancer.

Prior studies<sup>4-12</sup> have suggested that the overall frequency of divorce in cancer patients (range, 5-17%) does not differ from that of well-matched controls in the general population. Our results are consistent with this observation, revealing an overall frequency of divorce (11.6%) in the 3 patient cohorts representing >500 patients diagnosed with serious neurologic and oncologic illnesses. What was surprising, however, is the dramatic asymmetry in the occurrence of divorce and separation in these patient cohorts based on the sex of the affected partner. Thus, the woman was the affected spouse in nearly 90% of separations that occurred among our patient cohort. In fact, female sex was found to be the strongest predictor of divorce or separation in each of the 3 patient populations.

The reasons why women are preferentially affected becomes more evident in the analysis of the primary brain tumor cohort. There we found that, although marriage duration did not significantly differ between affected men and women, it was very significantly different between those who remained married and those who separated (Fig. 1). Combined with the gender disparity, therefore, we propose a model in which the incentive to remain in a relationship with a seriously ill spouse reflects a commitment of the healthy one to the relationship and that this commitment occurs more rapidly in the woman. Some

studies have in fact suggested that men are less able to undertake a caregiving role and assume the burdens of home and family maintenance compared with women.<sup>3-11</sup> Thus, a woman becomes willing sooner in the marriage to commit to the burdens of having a sick spouse.

Maintaining married status during the course of a devastating medical illness appears intuitively beneficial. Although we did not expect (and did not observe) a decreased survival in separated primary brain tumor patients due to their younger age and the lower frequency of the more malignant glioblastoma among these individuals, we did note several objective benefits in patients who stayed married, including less antidepressant use, greater participation in clinical trials (a social as well as a potential personal benefit), a lower rate of hospitalization, and a much higher likelihood that they would die at home (Table 5). Although this study did not formally address the reasons for these benefits in quality of life and quality of care which accrued to married patients, logistic and financial difficulties in accessing health care, trouble managing disease-related and treatment-related symptoms at home, and increased stress were frequently cited by divorced patients as explanations. Less insightful medical decision making by unmarried patients may also play an important role.<sup>27,28</sup>

Because the increased risk of partner abandonment when the woman is the affected partner remained consistent across the 3 diverse patient cohorts, we believe that these findings apply generally to patients with life-altering medical illness. Extrapolating from the primary brain tumor cohort that was studied in more detail, we recommend that medical providers be especially sensitive to early suggestions of marital discord in couples affected by the occurrence of a serious medical illness, especially when the woman is the affected spouse and it occurs early in the marriage. Early identification and psychosocial intervention might reduce the frequency of divorce and separation, and in turn improve quality of life and quality of care.

### Conflict of Interest Disclosures

The authors made no disclosures.

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