An Integrative Survival Analysis of Spinal Glioblastoma Multiforme: Predictive Factors Determining the Overall Outcome

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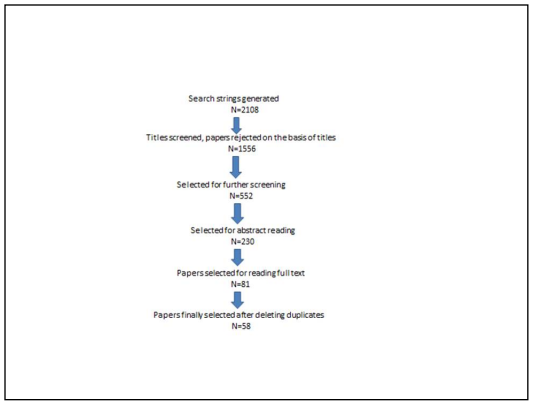
Introduction

Glioblastoma Multiforme (GBM) of the spinal cord is a rare entity. In the literature, various authors have shared their experiences with case report, small groups of patients which make it difficult to create a consensus regarding the treatment approach and predict the overall survival for spinal GBM. The aim of this study was to perform an integrative analysis of patients whose cases were selected from the published studies, and to examine the influence of various factors on overall outcomes.

Methods

A PubMed search was performed from 1950-2014 to select the articles containing information about the critical event (death), time to events and treatment characteristics

(Extent of resection with or without RT) in the patients with spinal GBM.



Results

128 cases with information regarding age/sex,critical events (death/recurrence), time to events, treatment were selected. Mean age was 27 yo.Patients between 18 - 65 yo age (14 mths) had better OS than extreme of ages (<18 yo,10.5 months and >65 yo, 2months)(p=0.0005).Univariate analysis showed age between 18-65 yo(HR=0.12,p=0.0005) and surgery with RT (HR=3.71,p=0.01) had a significant correlation with OS.In multivariable analysis, dorsal (OR=0.154,p=0.017) and conus (OR=0.091,p=0.030) tumor had lesser chance for mortality at 6 months. Median OS was 11 months. Median PFS was 5 months. Survival rate at 6 months, 12 months and 18 months were 71.3 %, 42.6% and 21.7%.Patients who received adjuvant therapy had a better median survival than surgery alone(p=0.0005).CSF spread was in 34.1 %,median survival 11 months.11.6 % patients with hydrocephalus,median survival 14 months.Local recurrence rate was 17.8 %.

Table : Demographic and treatment characteristic of 128 patients with primary spinal Glioblastoma Multiforme

Variable	No. of Patients (%)	Quality of Study (%)
Age		126(97.6%)
<18 years	23(18.4 %)	
18-65 years	68 (53.5%)	
>65years	4 (3.2%)	
Sex		128(98%)
Male	72(56.3%)	
Female	51(39.8%)	
Tumor Location		(100%)
Cervical	38(29.7 %)	
Cervico-dorsal	16(12.5%)	
Dorsal	54(42.2%)	
Conus	18(14.1%)	
NOS	2(1.6%)	
Symptoms	(%)	
Back pain	38(29.5 %)	68 128(52.8 %)
Sensory involvement	41(31.8%)	66 128(51.5%)
Extremity weakness	69(53.4 %)	69 128(53.9%)
Bladder/Bowel involvement	27(20.9%)	67 128(52.3%)
Surgery type		(100 %)
Biopsy	17(13.3%)	
STR	78(61.7%)	
GTR	15(11.7%)	
NOS	17(13.3%)	
Treatment type		(100%)
Surgery	26(20.3%)	
Sx-RT	42(32.8%)	
Sx+CT	5(3.9%)	
Sx+RT+CT	55(43%)	
CSF dissemination	44(60.3%)	73 128 (57%)
Brain mets	28(76.3%)	38 128 (29.8%)
Spine mets	10(7.8 %)	22 128 (17.2%)
Recurrence	23(17.8%)	52 128 (40.6%)
Hydrocephalus	15(25.9%)	58 128 (46%)

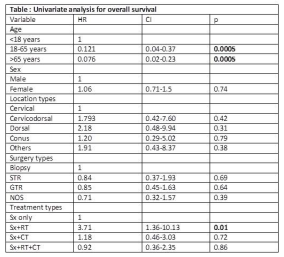
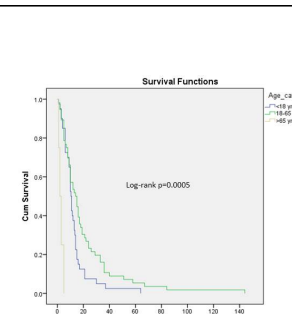
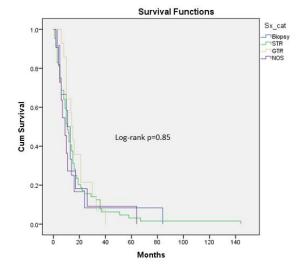
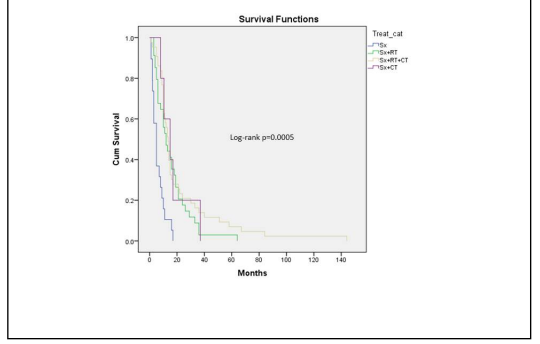


Table : Univariate analysis for overall survival

Variable	HR	CI	p
Age			
<18 years	1		
18-65 years	0.121	0.04-0.37	**0.0005**
>65 years	0.076	0.02-0.23	**0.0005**
Sex			
Male	1		
Female	1.06	0.71-1.5	0.74
Location types			
Cervical	1		
Cervicodorsal	1.793	0.42-7.60	0.42
Dorsal	2.18	0.48-9.94	0.31
Conus	1.20	0.29-5.02	0.79
Others	1.91	0.43-8.37	0.38
Surgery types			
Biopsy	1		
STR	0.84	0.37-1.93	0.69
GTR	0.85	0.45-1.63	0.64
NOS	0.71	0.32-1.57	0.39
Treatment types			
Sx only	1		
Sx+RT	3.71	1.36-10.13	**0.01**
Sx+CT	1.18	0.46-3.03	0.72
Sx+RT+CT	0.92	0.36-2.35	0.86







Conclusions

Management of spinal Glioblastoma Multiforme includes debulking of tumor and post-operative adjuvant therapy (radiotherapy and or with chemotherapy) irrespective of age, sex and location.

Learning Objectives

Knowledge about overall survival of spinal Glioblastoma Multiforme.

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