HEMORRHAGIC GLIOBLASTOMA MULTIFORM: PREVALENCE , PREDISPOSING FACTORS AND PROGNOSIS AMONG ADULT KFMC PATIENTS.

Dr. Ahmed Lary

Dr. Ali balbaid

Rabea Qutub

Saad Al-Maimouni

Introduction

- Gliomas is a collection of tumors arising from glial cells or their precursors within the central nervous system.

- Glioblastoma Multiform (GBM), considered grade four tumor which is the most common primary intracranial neoplasm of the central nervous system.

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- It has an prevalence of 15% to 20% of all primary central nervous system tumors.

- These GBM tumors can be presented in different forms. Intracranial hemorrhage (ICH) is one of these forms, which can happen to different degrees and extension with variation in degree of prognosis.

Aims & Objectives

- To determine prevalence of GBM patients who are presented with ICH and non-hemorrhagic GBM who attending National Neuroscience Institute(NNI), KFMC.

- To evaluate prognosis of GBM among grade four patients only presenting with intra cranial hemorrhage in KFMC (NNI).

- To assess predisposing factors which make high risk to develop ICH in GBM patients.

Methods – Setting & Subjects

- The data set used in this study involved 89 patients with GBM, of which 26 patients presented with ICH. Those patients received follow-up care in KFMC Clinics and were included in this study.
- The inclusion criteria any patients (age >18) diagnosed with GBM grade IV both male and female. The exclusion criteria is patients who have any hemolytic disease such as (hemophilia).

Methods – Study Design and sampling

- A retrospective medical record review will be performed from 2008 through 2013.

- Sample : all subject included in the study, the study did not base on any sampling technique as it has been involve whole population in KFMC.

Methods - Data Collection methods

- The research team will review how many patients presenting with ICH among GBM from the database of NNI in KFMC.
- This study will evaluate the effect of (receiving anticoagulant, radiation dose, chemotherapy, surgical type, tumor size and location) on being a risk factor to develop ICH on GBM.
- In addition, the study will review the prognosis of ICH GBM patients and compare it with non hemorrhagic GBM patients (post operative survival time).

Methods – Statistical Analysis

- we used T-Test to find any difference in mean among quantitative data as well as we used Chi – square test to find any association between qualitative variables.

- Cox regression used for survival analysis (survival time of ICH GBM patients).

- Logistic regression used to evaluate different variables in relation to develop ICH in GBM patients.

Results

Quantitative data in relation to hemorrhagic and non-hemorrhagic:

variable		mean	std. deviation	t-value	p-value
age	Non-hemorrhagic	50.25	16.6	-3.2	0.002
	hemorrhagic	62.85	18.1		
survival time	Non-hemorrhagic	2.5	1.1	2.7	0.009
	hemorrhagic	1.8	1.2		
tumor diameter Cm	Non-hemorrhagic	4.1	1.5	0.19	0.85
	hemorrhagic	4	1.3		

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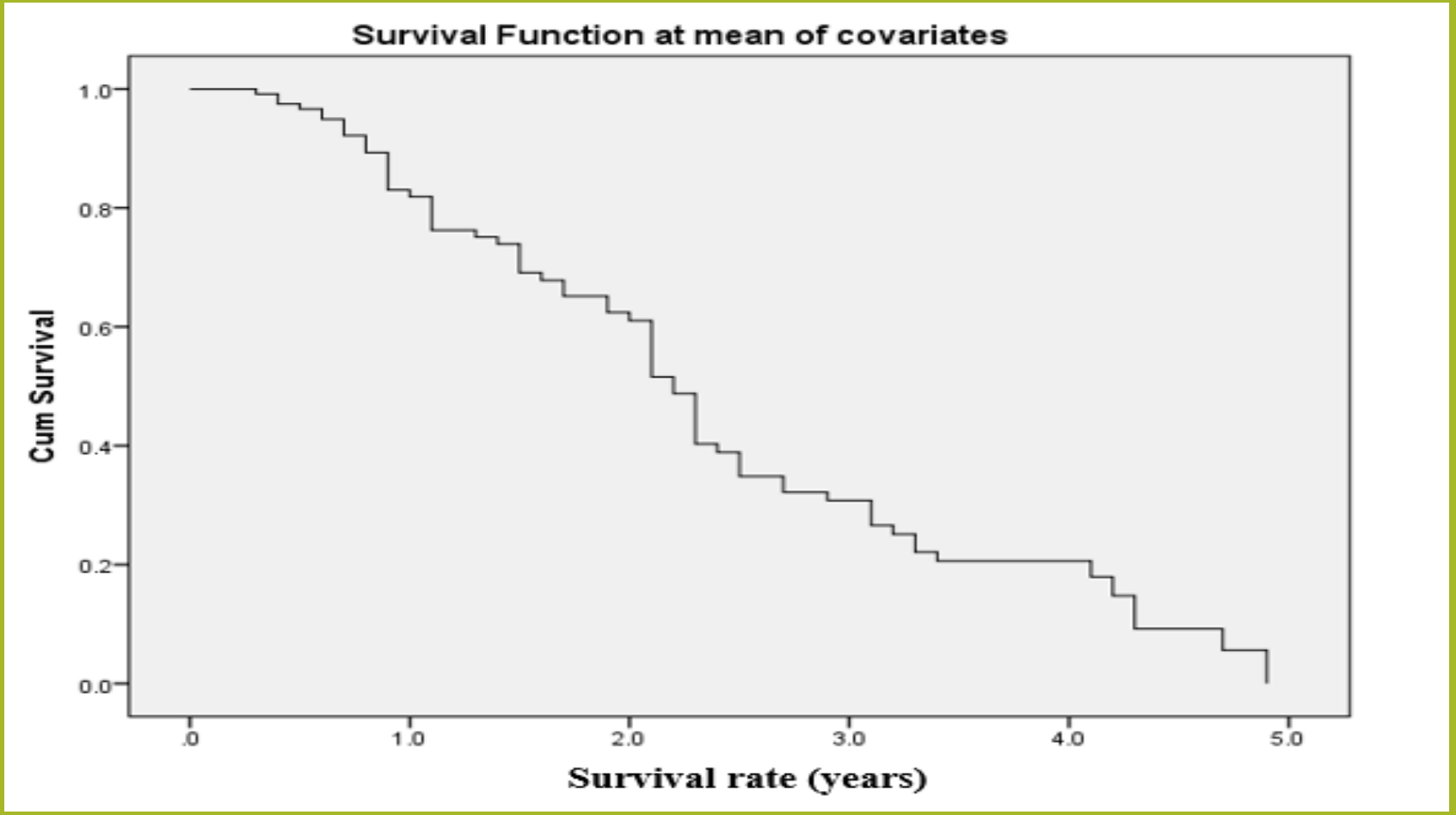
- The mean age of the non-hemorrhagic patients 50.3 years, where the hemorrhagic patient's mean age 62.9 years with P value = 0.002 which is significant difference . The mean of survival time in non-hemorrhagic patients is 2.5 years while the mean of survival time in hemorrhagic patients is 1.8 with P value = 0.009 which is significant difference.
- The hemorrhagic patients account for 26 (29.2%) while the non-hemorrhagic patients account for 63 (70.8%).

Results

Qualitative data in relation to hemorrhagic or non-hemorrhagic:

variable			count	%	p-value
gender	female	non-hemorrhagic	19	70.40%	0.57
		hemorrhagic	8	29.60%	
	male	non-hemorrhagic	44	71%	
		hemorrhagic	18	29%	
radiological location	frontal lobe	non-hemorrhagic	28	82.40%	0.19
		hemorrhagic	6	17.60%	
	parital lobe	non-hemorrhagic	13	61.90%	
		hemorrhagic	8	38.10%	
	temporal lobe	non-hemorrhagic	13	72.20%	
		hemorrhagic	5	27.80%	
	other lobes	non-hemorrhagic	9	56.20%	
		hemorrhagic	7	43.80%	
radiation dose	≤ 30 GY	non-hemorrhagic	11	64.70%	0.78
		hemorrhagic	6	35.30%	
	31-59 GY	non-hemorrhagic	23	74.20%	
		hemorrhagic	8	25.80%	
	60 GY	non-hemorrhagic	29	70.70%	
		hemorrhagic	12	29.30%	

RESULTS



The graph show survival time of the population range from 0.3 to 4.9 years with mean survival time = 2.3.

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- We found all variables in relation to survival time by using cox-regression was not significantly effects on survival time.

Results

All variables in relation to developing hemorrhagic GBM:

variable		p-value	OR	95.0% CI for OR	
				lower	upper
age		0.047	1.047	1.001	1.09
gender	male	0.677	1.35	0.327	5.59
	female*				
surgical type	gross total resection	0.25	4.15	0.368	46.89
	subtotal resection	0.926	0.893	0.082	9.67
	biopsy	0.16	9.87	0.405	240.5
	no surgery*				
tumor diameter Cm		0.169	0.701	0.422	1.16
survival time	dead	0.219	3.82	0.452	32.19
	alive*				
chemotherapy	adjuvant	0.988	0.987	0.186	5.25
	new adjuvant	0.298	0.204	0.01	4.09
	concurrent	0.071	28.61	0.753	1086.35
	no chemo*				
history of anti-coagulant	yes	0.05	0.203	0.041	0.998
	no*				
radiation dose	≤ 30 GY	0.473	0.511	0.082	3.2
	31-59 GY	0.176	0.327	0.064	1.65
	60 GY*				
radiological location	frontal lobe	0.005	0.035	0.003	0.354
	parietal lobe	0.224	0.258	0.029	2.29
	temporal lobe	0.153	0.214	0.026	1.77
	other lobes*				

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- The relation of age to develop hemorrhage has P value =0.047 which is significant and in the oods ratio = 1.04 which means every year increasing age will have (4%) to develop hemorrhage.
- the oods ratio of total surgical resection = 4.15 which means patients who had total surgical resection has more 4 times risk to develop hemorrhage than patients with no surgical intervention.

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- The relation of frontal lobe location of tumor to develop hemorrhage compared to other lobes location(censor) has P value =0.005 which is significant and in the oods ratio = 0.035 which means patients who has frontal lobe location of tumor has 96.5% less than other lobes to develop hemorrhage.

- The relation of using anti-coagulant agent to develop hemorrhage has P value =0.05 which is significant and in the oods ratio = 0.203 which means (20%) of the patients will have risk to develop hemorrhage.

- We found no variables except (age, using anti-coagulant agent and frontal lobe location of tumor) in relation to develop hemorrhage by using logistic-regression was significant.

Discussion

- Little JR et al, (4) perform study on brain tumor hemorrhage the sample size was 13 adult patients the prevalence of intracranial hemorrhage among GBM was 6% diagnosed by CT scan.

- Hou LC et al, (19) perform review about management options in GBM he found patient's survival ranges between 12 and 18 months with treatment, but patients without any intervention has less survival time.

- Tanaka S et al, (8) the study summarize the predisposing factors that associate with poor survival time was older age, deep lesion, multifocal lesions, lack of adjuvant treatment and surgical intervention (biopsy only).

Conclusion & Recommendations

- The prevalence of hemorrhagic GBM in the study population 29.2%, where the non-hemorrhagic GBM account for 70.8%.

- Hemorrhagic GBM patients mean survival time (1.8 years) which have worse prognosis (less survival time) than non-hemorrhagic GBM patients do.

- The predisposing factors, which make high risk to develop ICH in GBM patients, are increasing age of the patient and using anticoagulant agent. Frontal lobe location was the least prognostic factor to develop ICH in GBM patients comparable to other lobes locations.

- We recommend to increase the sample size to get more representative results.

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Thank you