Meningioma and Breast Cancer: Survival of Patients with Synchronous and Metachronous Tumours

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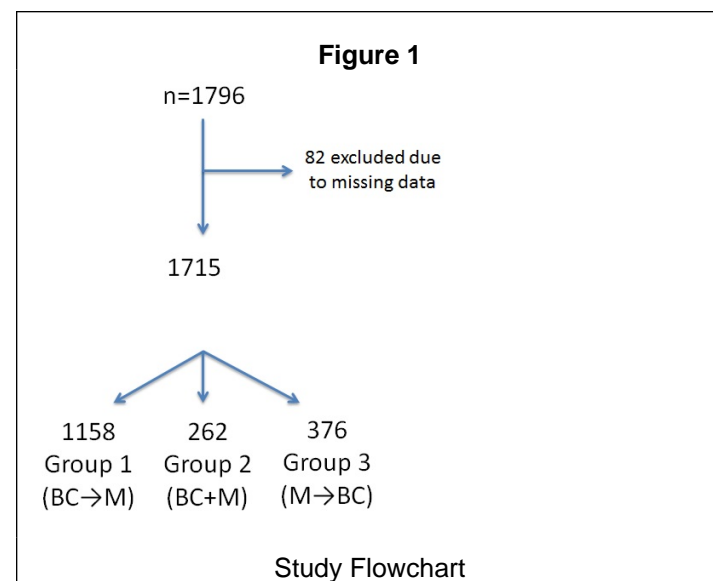Clinical Scholars Research and Training - Harvard Medical School Portugal
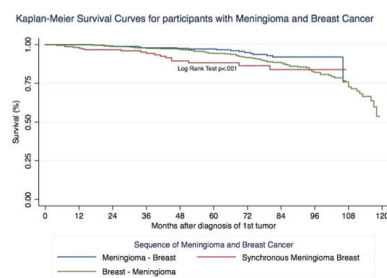
Introduction

The prognosis of the association between Breast Cancer (BC) and Meningioma (M) is still unknown. Our aim was to evaluate the survival impact of tumor exposure sequence in patients with both tumours.

Methods

Patients were divided in groups according to the tumors sequence: BC before M (group 1), synchronous BC+M (group 2) and BC after M (group 3). The SEER database was used. Demographics, meningioma and breast cancer variables were analyzed. The primary outcome was oncological survival.

Figure 1

n=1796

82 excluded due to missing data

1715

1158	262	376
Group 1	Group 2	Group 3
(BC→M)	(BC+M)	(M→BC)

Study Flowchart

Figure 2

Kaplan-Meier Survival Curves for participants with Meningioma and Breast Cancer (unadjusted).

Results

A total of 1715 patients were followed with a median follow-up of 84 months. Group 2 had the shortest survival (median: 32 months) and group 1 the longest (median: 110 months). Group 3 was the reference group.

On the unadjusted analysis group 2 had the shortest survival (HR 3.13, 95%CI: 1.62-6.04) - Figure 2 - and adjusted analysis confirmed the previous finding (HR 3.11, 95%CI: 1.58-6.19), with no statistical difference between the metachronous tumors groups. Increasing age (HR:1.13, 95%CI:1.11-1.15, $p<0.005$) and grade III meningioma (HR:4.51, 95%CI:1.90-10.69, $p<0.005$) were related with lower survival. Meningioma treatment had no influence on the survival ($p>0.05$). The association between surgery and radiotherapy in BC treatment improved the outcome (HR: 0.37, 95%CI: 0.23-0.93, $p<0.05$). (Table 1) Grade III meningioma and receptor hormonal status influenced synchronous tumors ($p<0.05$) but had no influence on metachronous tumors survival ($p>0.05$) on stratified analysis.

Table 1

Table 3. Hazard ratios for death of breast cancer and/or meningioma– Adjusted analysis

	No of subjects	Hazard ratio	p value	(95% IC)
Variable	1715			
Death by meningioma or breast cancer				
Meningioma → BC		1 (ref)		
BC + Meningioma		3.13	0.001	(1.58-6.19)
BC → Meningioma		1.01	>0.05	(0.65-1.90)
Age at diagnosis (year)		1.13	<0.001	(1.11-1.15)
Grade of meningioma				
I		1 (ref)		
II		1.48	>0.05	(0.41-5.35)
III		4.51	0.001	(1.90-10.69)
Unknown		1.12	>0.05	(0.55-2.26)
Treatment of meningioma				
None		1 (ref)		
Surgery		0.99	>0.05	(0.62-1.56)
Radiotherapy		0.90	>0.05	(0.43-1.87)
Breast Cancer stage				
In situ and localized		1 (ref)		
Regional		1.14	>0.05	(0.81-1.62)
Distant		0.27	>0.05	(0.04-1.98)
Treatment of breast cancer				
No treatment		1 (ref)		
Surgery or radiotherapy		0.57	>0.05	(0.29-1.14)
Surgery and Radiotherapy		0.37	<0.05	(0.23-0.93)
BC receptors (ER and PR)				
Both negative		1 (ref)		
One receptor positive		1.46	>0.05	(0.87-2.44)
Both positive		1.73	<0.05	(1.18-2.85)

BC → Meningioma – Meningioma was diagnosed after the Breast cancer diagnosis; BC + Meningioma – meningioma and breast cancer are synchronous cancers; Meningioma → BC – Meningioma precedes the diagnosis of breast cancer

Hazard ratios for death of breast cancer and/or meningioma– Adjusted analysis

Conclusions

Synchronous tumors were associated with lower survival, when compared with metachronous. Increasing age had a negative influence on patient survival. Eventhough surgery and radiotherapy for breast cancer had a positive influence in the outcome, meningioma treatment was not related with survival. Grade III meningioma and hormonal receptor status only influenced synchronous tumors patient survival.