

Clinical, Molecular and Treatment-related Factors Associated with Survival in Carcinomatous Meningitis

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Introduction

With rare exceptions, a diagnosis of carcinomatous meningitis (CM) from solid tumor histology is a harbinger of advanced malignancy. Clinical and treatment-related factors have been described in patients with CM, but most data are limited by small sample size, particularly in patients undergoing ventriculoperitoneal shunting (VPS). To the authors’ knowledge this study presents the largest cohort of CM patients in the literature.

Methods

A retrospective chart review of CM patients between 2010 and 2016 at Memorial Sloan Kettering Cancer Center was completed. Competing risk methodology was used to associate variables of interest with VPS, with death considered a competing event. Cox proportional hazards modeling was utilized to associate variables of interest with overall survival. Overall survival was depicted using Kaplan-Meier methodology. All statistical analyses were done in SAS (version 9.4, Cary, NC).

Results

314 patients were identified, 208 were women and 112 underwent VPS placement. Lung (37%) and breast (34%) histologies were codominant. The median overall survival was 3.9 months (95% CI: 3.2-4.4). The presence of headaches or gait difficulty increased the likelihood of VPS disease (both $p<0.05$). Having a primary diagnosis other than lung or breast was associated with a reduced risk of having VPS ($p=0.02$). VPS, older age, $KPS<80$, opening pressure >18 cm H2O and a CSF nucleated cell count >12 increased the risk of death (all $p<0.05$). Patients with headache improvement after VPS had better survival ($p<0.05$). Triple negative and HER negative breast cancer status and EGFR negative and ALK negative lung cancer status were unfavorable prognostic markers.

Conclusions

Headache and gait instability increase the likelihood of VPS placement in CM patients and may portend aggressive disease. Headache improvement following VPS is a favorable prognostic sign suggesting a pre-operative tap test may aid decision-making. Age, KPS, VPS, opening pressure, CSF nucleated cell count, concomitant visceral metastases and molecular profile impact survival.

Learning Objectives

By the conclusion of this session, participants should be able to (1) Describe the clinical factors that increase a CM patient's likelihood of receiving a VPS. (2) Be aware that headache improvement after VPS placement is a favorable prognostic sign and describe a method to help distinguish these patients pre-operatively. (3) Describe the molecular subtypes of breast and lung cancer that are favorable prognostic indicators in patients with CM.

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