Variations in Clinical Presentation and Outcomes among Medulloblastoma Subtypes: A Population-Based Study of 2,505 Patients from the Surveillance Epidemiology and End Result (SEER) Database (1973-2010)

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Introduction

Previous studies regarding the influence of medulloblastoma subtypes on survival outcomes have had small sample sizes and patient ascertainment bias. This study analyzes the impact of multiple medulloblastoma histologies on clinical presentation and outcomes.

Methods

Demographic and clinical data was abstracted on 2,505 histologically confirmed cases of medulloblastoma, between 1973-2010, from the SEER database. Four groups were created based on tumor histology and included classic type, desmoplastic, large cell, and medullomyoblastoma. Clinical outcome data was compared.

Results

A total of 2,505 cases were included in the analysis, consisting of 2,195 (87.6%) classic type, 236 (9.4%) desmoplastic, 63 (2.5%) large cell, and 11 (0.4%) medullomyoblastoma variants. Examination of the mean ages demonstrated that the desmoplastic subtype presented at a significantly older age than the classic (16.7 versus 14.2 years, $p = 0.023$) and large cell variant (16.7 versus 11.5 years, $p = 0.027$). Medulloblastoma was more common in males (N = 1,546, 61.7%), with no significant difference in gender distribution among histologic subtypes ($p = 0.092$). More specifically, although surgery and radiation combination therapy was most frequently performed across all subtypes (75.7% for the classic type; 69.5% for desmoplastic medulloblastoma; 73% for large cell medulloblastoma; 81.8% for medullomyoblastoma) surgery alone was performed at greater rates for desmoplastic (28.4) and large cell (25.4) medulloblastoma ($p = 0.001$). Among the subtypes, overall 5-year survival was 63%, 70%, 39%, and 45% for the classic type, desmoplastic, large cell, and medullomyoblastoma variants, respectively ($p < 0.001$).

Conclusions

Medulloblastoma is most often treated with surgery and radiation. Worse prognosis was associated with patients at extremes of ages (0-3 years of age and >45 years of age) and those that did not receive combination therapy (surgery-radiation). The desmoplastic medulloblastoma subtype had the longest overall and cancer specific survival while large cell and medullomyoblastoma subtypes were associated with a worse prognosis.

Learning Objectives

By the conclusion of this session, participants should be able to:

1) Describe the importance of obtaining a specific histologic diagnosis in the medulloblastoma patient.

2) Understand that said diagnosis will influence treatment options and patient outcomes.

3) Discuss, in small groups, generalized differences in patient demographics and clinical profiles according to specific histologic subtypes of medulloblastoma.