72. Brain and Spinal Cord

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Emerging Prognostic Factors for Clinical Care

The authors have not noted any emerging prognostic factors for clinical care at this time.

Risk Assessment Models

The AJCC recently established guidelines that will be used to evaluate published statistical prediction models for the purpose of granting endorsement for clinical use.[1] Although this is a monumental step toward the goal of precision medicine, this work was published only very recently. Therefore, the existing models that have been published or may be in clinical use have not yet been evaluated for this cancer site by the Precision Medicine Core of the AJCC. In the future, the statistical prediction models for this cancer site will be evaluated, and those that meet all AJCC criteria will be endorsed.

Recommendations for Clinical Trial Stratification

In addition to defining the specific objectives for trials, important elements include selection of the patients who are eligible for the study. An example is adult patients with newly diagnosed GBM. As we understand the specific molecular and genetic characteristics that may affect outcome, trials also may tailor treatments to specific patient subgroups within a disease entity. This is the basis for "precision medicine" approaches. An example of this would be selecting patients whose GBM tumors express a specific marker, such as the mutant EGFRvIII, for a vaccine trial that targets that specific protein.

Defining stratification criteria is an essential part of cancer clinical trials. Knowledge of known prognostic factors may affect the interpretation of the results of clinical trials in terms of analyzing outcome. General prognostic factors across several brain tumor types include age, clinical status of the patient, and the extent of resection that could be performed. For GBM, the subsets of patients whose tumors have methylation of the *MGMT* gene or mutation in the *IDH* gene have better survival than those whose tumors do not have these characteristics.[2] These prognostic factors must be taken into account when results of treatment are presented. If many patients enrolled in a clinical trial of GBM have these characteristics, the expectation would be that the survival results would be better than those of nonselected historical controls. These stratification factors therefore allow partitioning of patients entering a trial to ensure the maximum "balance" of factors that should be distributed equally among the experimental and standard arms of the trial.

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Other molecular and cytogenetic factors may affect response to therapy. These factors are termed prognostic factors. An example is the finding that despite similar histologic appearances in anaplastic oligodendroglioma, the subset of patients whose tumors have a loss of 1p and 19q derive a greater benefit from combined RT and chemotherapy than those whose tumors do not have this finding. This is important in terms of planning studies with oligodendroglioma.

Because cancer trials are developed globally, it is vitally important that the stratification of trials for similar patients be the same across nations, so that results can be compared across trials or with known standards of management.

Bibliography

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