Proton therapy for craniospinal radiochemotherapy reduces myelotoxicity and improves chemotherapy completion in adult medulloblastoma


Introduction
➢ Combined radiochemotherapy for adult medulloblastoma (aMB) improves survival compared to radiation alone
➢ Current chemoradiation regimens are associated with high rates of myelotoxicity and toxicity-related treatment termination
➢ Photon craniospinal irradiation (CSI) carries an inherent risk of myelotoxicity due to the exit dose to vertebral body marrow while proton CSI can be delivered via a marrow-sparing approach
➢ We therefore hypothesized that proton chemo-CGI could reduce rates of myelotoxicity and toxicity-related treatment termination relative to photon-based treatment
➢ Published results from the NOA-07 trial were used for comparison

Methods
➢ Patient population
  o Age ≥15
  o Received vertebral-body-sparing proton chemo-CGI for newly-diagnosed aMB
  o Planned to receive ≥4 cycles of chemotherapy
➢ Treatment: CSI dose of 23.4 or 36 CGE with boost to 55.8 CGE
➢ Myelotoxicity was evaluated using the NCI’s CTCAE v3.0 to match grading scheme in NOA-07
➢ Correlations with toxicity were assessed using chi-square analysis;
  survival by Kaplan Meier

Results
➢ Patients
  • 13 male, 11 female
  • Median age: 28 years (range 18–58)
  • 54% were average-risk
  • 50% received a CSI dose of 23.4 CGE
➢ Of 21 patients with available hematologic data: 95% received cisplatin, 76% vincristine, 67% CCNU, and 62% cyclophosphamide
➢ Median follow-up time: 2.4 years
➢ Survival: 2-year PFS: 88% | 2-year OS: 100%
➢ Adjuvant-phase cyclophosphamide was significantly associated with grade ≥3 leukopenia (p<0.01) and neutropenia (p=0.01).

Conclusions
➢ Proton chemo-CGI for aMB increases rates of adjuvant chemotherapy completion and reduces rates of concomitant-phase leukopenia.
➢ In patients not receiving cyclophosphamide (an agent not included in the NOA-07 regimen) proton chemo-CGI lowers rates of adjuvant-phase myelotoxicity compared to contemporaneous photon-CGI control.

References

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