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## Survival rates and prognostic predictors of high grade brain stem gliomas in childhood: a systematic review and meta-analysis.

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### Abstract

Diagnosis of a pediatric high grade brain stem glioma is devastating with dismal outcomes. This systematic review and meta-analysis was undertaken to determine the survival rates and assess potential prognostic factors including selected interventions. Studies included involved pediatric participants with high grade brain stem gliomas diagnosed by magnetic resonance imaging or biopsy reporting overall survival rates. Meta-analysis was undertaken using a binomial random effects model. Sixty-five studies (2336 participants) were included. Meta-analysis showed 1 year overall survival (OS) of 41% (95% confidence interval (CI) 38-44%, I-sq 52%, 2083 participants), 2 year OS of 15.3% (95% confidence interval 12-20%, I-sq 73.1%, 1329 participants) and 3 year OS of 7.3% (95% confidence interval 5.2-10%, I-sq 26%, 584 participants). Meta-analyses of median overall survival results was not possible due to the lack of reported measures of variance. Subgroup analysis comparing date of study, classification of tumor, use of temozolomide, non-standard interventions or phase 1/2 versus other studies demonstrated no difference in survival outcomes. There was insufficient data to undertake subgroup meta-analysis of patient age, duration of symptoms, K27M histone mutations and AVCR1 mutations. Survival outcomes of high grade brain stem gliomas have remained very poor, and do not clearly vary according to classification, phase of study or use of different therapeutic interventions. Future studies should harmonize outcome and prognostic variable reporting to enable accurate meta-analysis and better exploration of prognosis.

**KEYWORDS:** Brain stem glioma; DIPG; Pediatrics; Prognostic; Survival and systematic reviewPMID: 28681244 DOI: [10.1007/s11060-017-2546-1](https://doi.org/10.1007/s11060-017-2546-1)Publication type LinkOut - more resources