

Review

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Delay in the diagnosis of paediatric brain tumours: a systematic review

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Abstract

Purpose: A delay in obtaining a diagnosis has been associated with inferior outcomes across several cancer types, including paediatric brain tumours. However, no clear evidence exists in this population. We aimed to quantify the reported pre-diagnostic symptom interval (PSI) as the time from onset of first symptoms to diagnosis in the literature, in addition to evaluating the relationship between delay and outcomes, including survival.

Methods: A systematic review of the literature was performed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. MEDLINE, Wiley Online Library, Web of Science and EMBASE databases were searched. We considered all sources published between 1st January 2010 and 5th November 2022. Children and adolescents aged under 21 years, with new symptomatic primary brain tumour diagnoses, were included.

Results: Of 3123 studies identified, 11 were included for analysis. Owing to study heterogeneity, a quantitative meta-analysis was not feasible; however, a narrative synthesis was performed. The median reported PSI varied widely, ranging between 28 and 760.8 days. We failed to identify a significant association between prolonged PSI and inferior overall survival. Few factors were consistently associated with prolonged PSI, amongst them only tumour grade and patient age.

Conclusion: Delayed diagnosis of paediatric brain tumours was not associated with inferior survival within this review. This 'waiting time' paradox appears to result from several confounding factors including tumour biology, patient population and key systematic factors that were inconsistently reported. Diagnostic interval clearly presents a complex variable, reflected further by disparity in the reporting of delay within the literature. Ultimately diagnostic interval is unlikely to provide a meaningful representation for all tumour types and should not detract from sharp clinical acumen and prompt diagnosis.

Keywords: Central nervous system tumours; Childhood brain tumours; Diagnostic delay; Pre-diagnostic symptom interval.

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