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Body mass index as a prognostic indicator of overall survival in glioblastoma: A systematic review and meta analysis

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Abstract

Background: Many previous studies have investigated the prognostic value of body mass index (BMI) for GBM outcomes with varying results. We present a comprehensive literature review and meta-analysis investigating BMI as a prognostic value in GBM.

Methods: A systematic review of literature on adult patients with GBM published between 1999 and 2023 was conducted within OVID Medline, Pubmed, and Scopus. Non-English studies, unpublished studies, prior studies in series, and studies without BMI or survival data were excluded from our analysis. Random-effects meta-analyses were conducted on hazard ratios (HRs) for overall survival (OS) and progression-free survival (PFS). Risk of bias was assessed using the Newcastle Ottawa Scale.

Results: 29 articles were identified, and 14 studies were included after full text review. 9 studies were included in analysis of OS for overweight versus normal weight with pooled HR of 1.02 and extremely high heterogeneity ($I^2 = 81\%$). 7 studies contributed data for OS for obese versus normal weight with pooled HR of 0.98 and high heterogeneity ($I^2 = 81\%$). Subgroup analysis of overweight versus normal weight and obese versus normal weight yielded conflicting results. 5 studies contributed data for PFS with HR of 1.17 and again demonstrated high heterogeneity ($I^2 = 76\%$).

Conclusions: Pooled results from all studies demonstrated very high heterogeneity and inconsistent results on subgroup analysis. Limitations included the small number of studies available, the poor quality of reported results, and differences in adjustment of HR between studies. No conclusion regarding the association between BMI and GBM survival can be drawn at this time.

Keywords: Body mass index; Glioblastoma; Overall survival; Prognostic indicator; Progression free survival.

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