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Mobile phone use and risk of brain tumours: a systematic review of association between study quality, source of funding, and research outcomes.

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Abstract

Mobile phones emit electromagnetic radiations that are classified as possibly carcinogenic to humans. Evidence for increased risk for brain tumours accumulated in parallel by epidemiologic investigations remains controversial. This paper aims to investigate whether methodological quality of studies and source of funding can explain the variation in results. PubMed and Cochrane CENTRAL searches were conducted from 1966 to December 2016, which was supplemented with relevant articles identified in the references. Twenty-two case control studies were included for systematic review. Meta-analysis of 14 case-control studies showed practically no increase in risk of brain tumour [OR 1.03 (95% CI 0.92-1.14)]. However, for mobile phone use of 10 years or longer (or >1640 h), the overall result of the meta-analysis showed a significant 1.33 times increase in risk. The summary estimate of government funded as well as phone industry funded studies showed 1.07 times increase in odds which was not significant, while mixed funded studies did not show any increase in risk of brain tumour. Metaregression analysis indicated that the association was significantly associated with methodological study quality ($p < 0.019$, 95% CI 0.009-0.09). Relationship between source of funding and log OR for each study was not statistically significant ($p < 0.32$, 95% CI 0.036-0.010). We found evidence linking mobile phone use and risk of brain tumours especially in long-term users (≥ 10 years). Studies with higher quality showed a trend towards high risk of brain tumour, while lower quality showed a trend towards lower risk/protection.

KEYWORDS: Brain tumour; Meta-analysis; Metaregression; Mobile phones; Risk

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