Cancers and mobile phone use

The widespread use of cellular telephones generates concern about possible adverse health effects, particularly brain tumours. The results of most previous studies of brain tumours in mobile phone users have been negative [1,2] although a Finnish study and a Swedish study have indicated an increased risk [3,4]. Limitations of previous studies are the small number of individuals with long-term exposure and lack of power to study the effects of long-term use.

Current human cancer development studies indicate that latency from first exposure to clinical cancer detection ranges from >10 years to sometimes 20 years [5]. The electromagnetic fields emitted from cellular phones do not have enough energy to break chemical bonds or damage DNA and are unlikely to initiate tumours [6]. However, if the mechanism is one of promotion rather than initiation, a shorter induction period is possible.

Multi-centric studies have the potential for (i) improving inferences on the validity of the findings through the simultaneous replication of the study in different populations and (ii) increasing the precision of the effect estimates through large sample sizes [7].

Lahkola et al. [8] describe an international, collaborative case–control study on the effect of mobile phones on risk of meningioma of 1209 cases in five countries and 3299 population controls. The study raises several noteworthy methodological issues and adds to previous articles covering three countries [9–11]. It is an integral part of a larger multinational study on meningiomas, gliomas, acoustic neuromas and parotid gland tumours in 13 countries (interphone) [12].

Cases were identified from hospitals and controls from national population registers or general practitioners’ patient lists. History of mobile phone use was obtained by direct interview. The ‘risk of meningioma among regular users of mobile phones appears lower than among never or non-regular users (OR = 0.76, 95% CI = 0.65–0.89)’. The pattern of risks for regular mobile phone users was below that for never or non-regular users (reference category) by all exposure variables (frequency of use, years of use, etc.). Risk decreased in all five countries: OR 0.87 (95% CI 0.60–1.27) for Denmark, 0.75 (0.56–1.01) for Finland, 0.85 (0.57–1.29) for Norway, 0.68 (0.49–0.94) for Sweden and 0.72 (0.51–1.01) for South East England.

Could this be due to chance? For a null hypothesis of no effect of mobile phone use, the probability of a country-specific OR and the probability of all five OR’s being <1.0 are 50 and 3%, respectively. The systematic pattern of decreased risk in the aggregate data indicates that the findings are unlikely to be due to chance.

Some of the reduction in risk estimates could be due to selection bias deriving from a differential participation of exposed and non-exposed people among cases and controls (in particular controls who are not regular mobile phone users may participate less than controls who are regular mobile phone users). In the absence of further data, the observed risk reduction is compatible with three different inferences: (i) that there is no association between mobile phone use and meningioma occurrence if all the observed reduction in risk were due to bias, (ii) that there is a positive association if the observed reduction results from greater reduction due to bias masking increased exposure risk and (iii) that there is a negative association between exposure and effect.

Without substantiation of bias reducing risk estimates, the data support no particular inference of either negative or positive association. The most one can draw is that a strong positive association might be ruled out, but a possible weak positive association cannot be.

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References


