



INTERPHONE: Mobile phone brain cancer study in the UK

As part of the INTERPHONE project, UK medical researchers have published a large epidemiological study on the association between mobile phone use and the brain cancer, glioma. The researchers were mostly medical statisticians and epidemiologists from various Centres and Institutes in England. The study was published on line in the British Medical Journal in January 2006.*

Study Design

The study used a population based case-control design. The cases consisted of 966 patients aged 18-69 years diagnosed with a glioma from 1st December 2000 to 29th February 2004. They were drawn from hospital departments and cancer registries for the south east and northern regions of the UK with a large total catchment population of 28.4 million. The mobile phone usage patterns of the cases were compared to 1716 controls randomly selected from general practitioner lists. The controls were frequency matched to reflect the age, sex and geographical distribution of the cases. Estimates of mobile phone usage patterns were obtained through personal interviews with all subjects or subject proxies (7%) who were mainly spouses. The recorded phone usage data included the network operator, type of phone (analog or digital), area of use (urban or rural), start and stop year, the number and duration of calls made and received, and the side of the head the phone was mostly used. Usage estimates included an adjustment for lower exposures from hands-free devices.

Study results

The authors found that the overall odds ratio for regular phone use was 0.94 (95% CI[†]: 0.78 to 1.13). There was no relation for risk of glioma and time since first use, lifetime years of use, and cumulative number of calls and hours of use. A sub-analysis of analog phones indicated no significant increased risk with any exposure metric. A significant excess risk for reported phone use ipsilateral (same side) to the tumour (1.24, CI: 1.02 to 1.52) was paralleled by a significant reduction in risk (0.75, CI: 0.61 to 0.93) for contralateral (opposite) use, suggestive of recall bias.

Potential study biases

Due to the low overall response rates for cases (51%) and controls (45%) in the study, the authors examined the various possibilities for participation bias. For cases, they found that most of the non-respondents were patients with high grade tumours who



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were unable to participate due to very short survival spans. They reasoned that this should not bias the results as their data indicated no differences in the OR between cases with high or low grade tumours.

For the controls, the authors found that a large proportion of them were “uncontactable”, and that constraints imposed by ethical approval bodies prevented more than one follow-up attempt. This led to a selection bias where the interviewed controls were more affluent than the cases. The authors made adjustments for this bias (since more affluent people are more likely to own mobile phones) but acknowledge that they may not have completely removed its potential influence.

Author conclusions

The authors generally conclude that: *“Use of a mobile phone, either in the short or medium term, is not associated with an increased risk of glioma. This is consistent with most but not all published studies.”* They also note that their study contained substantially more long-term users (>10 years) than previously reported studies.

With regard to the laterality results they conclude: *“The complementary positive and negative risks associated with ipsilateral and contralateral use of the phone in relation to the side of the tumour might be due to recall bias.”* The alternative interpretation of both adverse and beneficial effects of the same side and opposite side exposures is a highly implausible dose-response mechanism.

References

- [1] S. J. Hepworth, M. J. Schoemaker, K. R. Muir, A. J. Swerdlow, M. J. van Tongeren, and P. A. McKinney, "Mobile phone use and risk of glioma in adults: case-control study," *BMJ*, 2006.

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* Gliomas are the most common malignancy of the central nervous system in adults with an extremely poor prognosis. They originate in glial cells which surround and support nerve cells in the brain.

† CI=Confidence Interval.



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