Interphone Comment – 17th May, 2010

Prepared by Professors Rodney Croft, Michael Abramson & Malcolm Sim

Australian Centre for Radiofrequency Bioeffects Research

BACKGROUND

It has taken over 10 years, but now the results of the largest study designed to investigate whether mobile phone use is associated with brain tumours in adults has been released[1]. The study, known as Interphone, was today published in the International Journal of Epidemiology.

Interphone combined data from 13 countries on two types of brain tumour (meningioma and glioma), and compared mobile phone use in more than 5000 people who suffered from these tumours, to that of age- and gender-matched control participants. The rationale behind this approach is that if mobile phones increased the risk of brain tumours, we would expect that cases with brain tumours would have used mobile phones more than controls without brain tumours.

RESULTS & INTERPRETATION

The main findings of Interphone were that: (1) mobile phone use of greater than 1 year was not associated with any increased risk of meningioma (usually a benign brain tumour), and (2) mobile phone use of greater than 1 year was not associated with increased risk of glioma (an aggressive malignant brain tumour).

Many other analyses were also conducted. As argued by the authors, these need to be assessed as a complete set of analyses and any one result cannot be taken in isolation, as the number of such additional statistical tests (i.e. hundreds) substantially increases the probability of any increased risk in any particular analysis being due to chance.

Key features of these additional analyses include: (1) Overall, mobile phone use was lower in those who suffered meningioma or glioma, than in controls; (2) There were more analyses suggesting a lower risk of brain tumours from mobile phone use than suggesting an increased risk; (3) The highest cumulative level of mobile phone call time was associated with increased risk of both meningioma and glioma, but this was only for the cases where start of mobile phone use was between 1 and 4 years before the diagnosis and the number of cases was small. If mobile phone use played a role in tumour development, an increase in tumour risk would be expected in those starting mobile phone use 'greater the 4 years' before their diagnosis, but this was not found in the Interphone results; (4) For all other measures of mobile phone use, no increased risk of either glioma or meningioma was found.

As is argued in the paper, none of these *additional* results provides support for the conclusion that mobile phone use causes or protects against developing brain tumours. For example, the finding that there was an increased risk *of gliomas in the group with the highest 10% of mobile phone call*

[1] E. Cardis et al., Brain tumour risk in relation to mobile telephone use. International Journal of Epidemiology, 2010; doi: 10.1093/ije/dyq079.

time in short term users, is limited in that: (1) Glioma risk did not increase with increasing phone usage, but rather there was just one discrete group that had an increase; (2) There were reported usage levels in that particular group that did not appear realistic, and once those data were removed, there was no longer an increased glioma risk; (3)That finding comes from a measure of mobile phone use (cumulative call time) which has been shown to be unreliable in both Interphone[2,3] and ACRBR research[4].

LIMITATIONS

Exposure Duration – As exposure latency is limited to a maximum of 12 years in this study, no comment can be made regarding the possibility that mobile phone use may induce tumours with a latency of greater than 12 years.

Comparability of Exposure to Modern Day – The exposures reported in Interphone are substantially lower than those reported in the present day. Thus there remains the possibility that higher levels of exposure than those in Interphone may be related to brain tumours. However, it should be noted that the levels in Interphone are similar to those in other studies which have claimed that mobile phones do cause brain tumours[5], and so the exposure levels within Interphone are able to address those claims.

Age Range – As the minimum age studied in Interphone was 30 years, no comment can be made regarding the hypothesis that mobile phones induce tumours in younger people, whose nervous system is still developing. Further studies are required, such as the current Mobi-kids study investigating mobile phone use and brain tumours in those aged between 10 and 24 years.

Other Tumour Types – Interphone has also analysed acoustic neuroma and parotid gland tumour data. These were not reported in the present publication, and so the above discussion is restricted to meningioma and glioma.

SUMMARY

Until now there have been concerns that mobile phones were causing increases in brain tumours. Interphone is both large and rigorous enough to address this claim, and it has not provided any convincing scientific evidence of an association between mobile phone use and the development of glioma or meningioma. While the study demonstrates some weak evidence of an association with the highest tenth of cumulative call time (but only in those who started mobile phone use most recently), the authors conclude that biases and errors limit the strength of any conclusions in this group. It now seems clear that if there was an effect of mobile phone use on brain tumour risks in adults, this is likely to be too small to be detectable by even a large multinational study of the size of Interphone.

---

[2] M. Vrijheid et al. Validation of short-term recall of mobile phone use for the Interphone Study. Occupational & Environmental Medicine, 2006; 63: 237–43.

[3] M. Vrijheid et al. Recall bias in the assessment of exposure to mobile phones. Journal of Exposure Science & Environmental Epidemiology, 2009; 19:369–81.

[4] I. Inyang et al. A new method to determine laterality of mobile phone use in adolescents. Occupational & Environmental Medicine, 2009; doi: 10.1136/oem.2009.049676.

[5] e.g. L. Hardell et al, Case-control study on the use of cellular and cordless phones and the risk for malignant brain tumours. International Journal of Radiation Biology, 2002; 78(10):931-6.