



LETTERS TO THE EDITOR

RE: "LONG-TERM MOBILE PHONE USE AND BRAIN TUMOR RISK"

exposure time long enough to properly address the potential adverse late health effects of mobile phone use," immediately after remarking, "Studies of ionizing radiation . . . have indicated that the induction period of radiation-induced solid tumors is probably at least 10 years" (1, p. 526).

- Tumor location: Almost all of a cell phone's radiation plume to the brain goes to the temporal lobe. The Lönn et al. study combines the temporal and parietal lobes, including tumors that are only partially within either lobe. The net effect of not reporting temporal lobe tumors alone is to diminish any potential effects for the temporal lobe alone.
- Latency time *and* tumor location: For ≥ 10 -year ipsilateral exposure since first regular use for the *combined* parietal and temporal lobes, the study reports eight glioma cases and one meningioma case. There is insufficient statistical power to show a statistically significant increased risk, yet the authors report a small (10 percent) increased risk of glioma.

When they look at glioma and meningioma without considering tumor location, for ≥ 10 years since first regular ipsilateral use, there are more cases (14 glioma, four meningioma). More cases provide additional statistical power. With more statistical power, the study shows an 80 percent increased risk of glioma and a 40 percent increased risk of meningioma. The confidence level for the increased risk of glioma is 86 percent. (The study does not report a *p* value. The confidence level is based on calculating the *p* value from the reported 95 percent confidence intervals (a rounding error may result; requests to the authors for the *p* value were refused)).

- Laterality: Tables 5 and 6 report laterality data. All other tables do not include laterality. Given that the radiation plume is on only that side of the head where the cell phone is used, reporting results without laterality is a dubious exercise.
- Focus on grades of gliomas: It is common for a glioma originally diagnosed as grade I to progress through each grade (2). Yet the study appears to indicate that if cell phones are a risk, then the odds ratio should increase by tumor grade. The study reports, "Furthermore, the odds ratio did not increase, regardless of tumor histology" (1, p. 526). It is not clear why this histology hypothesis would be stated, and it is unlikely to have any relevance.

Examples of direct contradictions between the text and the data reported in the tables follow:

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The recently published study by Lönn et al. (1) is flawed in many ways. In a broad overview, too few cases were included to enable the authors to find an increased risk for a reasonable latency time at the brain location where a cell phone's radiation plume exists. Furthermore, there are direct contradictions between the text of the paper and the data as reported in the tables. In essence, the data show an increased risk, whereas the text says that there is no increased risk.

Among the flaws of this study are the following:

- Latency time: Too few cases had ≥ 10 years of exposure. The study even reports, "No studies to date have had an

- The abstract reports, "No risk increase was found for ipsilateral phone use for tumors located in the temporal

- and parietal lobes” (1, p. 526). Yet the study reports (table 6) that the risk of a glioma, for a duration of regular ipsilateral use of ≥ 10 years, is elevated by 10 percent (odds ratio = 1.1, 95 percent confidence interval: 0.8, 1.5).
- The Discussion section begins, “We observed no increased risk of glioma or meningioma related to mobile phone use, regardless of . . . duration of use” (1, p. 529). However, the study reports (table 5) that the risk of a glioma is elevated (odds ratio = 1.8, 95 percent confidence interval: 0.8, 3.9). Similarly, the risk of meningioma is elevated (odds ratio = 1.4, 95 percent confidence interval: 0.4, 4.4). That these results are not statistically significant does not negate an elevated risk, but only the confidence in the finding.

ACKNOWLEDGMENTS

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REFERENCES

1. Lönn S, Ahlbom A, Hall P, et al. Long-term mobile phone use and brain tumor risk. *Am J Epidemiol* 2005;161:526–35.
2. Kleiheus P, Cavanee W. Tumours of the nervous system. Lyon, France: IARC Press, 2000:10, 17, 22.

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