

Re: Mobile Phone Use and Brain Tumors in Children and Adolescents: A Multicenter Case–Control Study

Aydin et al. (1) contradict their widely publicized conclusion that there is no relationship between cell phone use and brain

Table 1. Discrepant definitions of ipsilateral and contralateral cell phone use*

Source	Exposure		Comments
	Ipsilateral	Contralateral	
Dictionary	Situated or appearing on same side of body	Occurring or acting in conjunction with a part of the body	Does not deal with proportionality
Aydin et al. 2011 (1)	Use predominantly on same side of tumor or use on both sides	Use mostly on opposite side from tumor	Predominantly and mostly not defined. Asymmetrical definitions.
Inskip et al. 2001 (4)	$RR = (\sqrt{OR_{ipsi}} + 1)/2$	$RR = (\sqrt{OR_{contra}} + 1)/2$	Case subjects only. Ipsilateral and contralateral ORs are not defined.
Lönn et al. 2004 (5)	Same side of head as tumor or both sides of head	Opposite side of head as tumor or both sides of head (table 3 footnote)	Underestimates true ipsilateral risk and overestimates true contralateral risk.
Hardell et al. 2009 (2)	Greater than 50% use on same side of head as tumor	Less than 50% use on opposite side of head as tumor	Underestimates true ipsilateral risk and overestimates true contralateral risk.

* RR = relative risk; OR= odds ratio.

tumors. They conclude that there is “The absence of an exposure–response relationship. . . in terms of the amount of mobile phone use.” Yet they also report an increased brain tumor risk, with their odds ratio (2.15, 95% confidence interval = 1.07 to 4.29, $P = .001$) indicating a clear exposure–response relationship 2.8 years after the first cell phone subscription. Their results suggest that brain cancer in children and adolescents may have a shorter latency than in adults—a finding that others have also indicated (2,3).

In table 4, “operator recorded use” (group 1) was from phone company records and “self-reported use” (group 2) had the identical numbers of case and control subjects. Yet when case and control subjects are compared by use categories, the numbers differ.

The article states that operator data were available for 35% and 34% of the case and control subjects, respectively, whereas data reported from operators in table 4 include 56.7% of both subject groups.

Twelve of the 13 laterality results indicated higher risks of contralateral than ipsilateral tumors. However, this article’s definitions of ipsilateral and contralateral use differed from dictionary definitions and from those used in all previous cell phone studies (Table 1).

The authors reported 423 eligible case and 909 eligible control subjects, with participation by 352 (83.2%) case and 646 (71.0%) control subjects, resulting in exclusion of 71 case and 263 control subjects. When the reasons for exclusion are summed, there were 121 case subjects (50 additional) and 280

control subjects (17 additional). This would result in case participation of 60% and control participation of 69%, which in turn would likely increase various biases.

Other data discrepancies of Aydin et al. (1) are excluding the most common childhood brain tumor, pilocytic astrocytoma (histology code, 9421), whereas ependymoma, glioma, malignant no specific type, and medulloblastoma (primitive neuroectodermal tumor) were included. In the United States, the incidence of each of these rare tumors decreases with increasing age (6). Commenting on the implications of these declining rates with age, Dr Michael Kundi published his finding [16 months before Aydin et al. (1)] that, “brain tumours with no or decreasing incidence trends for increasing age must be omitted from analysis, at least for short exposure durations” (7).

Finally, the Funding and Notes section reported that several cell phone companies provided funding for this study, but there were no declarations regarding individual authors’ financial support or conflicts of interest.

These numerous discrepancies suggest a poor peer-review process and/or a rush to publish. Overall, the findings of Aydin et al. (1) are supportive of a positive relationship between cell phone use in children and increased risk for brain tumors with shorter latency than those that have generally been found for adults. In that regard, it is noteworthy that Cardis et al. (3) recently reported that heaviest cell phone users had a statistically significantly ($P = .01$) “increasing trend in gliomas with increasing radiofrequency dose after seven years.”

Further study is clearly merited on this important issue.

L. LLOYD MORGAN
RONALD B. HERBERMAN
ALASDAIR PHILIPS
DEVRA LEE DAVIS

References

1. Aydin D, Feychting M, Schüz J, et al. Mobile phone use and brain tumors in children and adolescents: a multicenter case–control study. *J Natl Cancer Inst.* 2011;103(16):1–13.
2. Hardell L, Carlberg M. Mobile phones, cordless phones and the risk for brain tumours. *Int J Oncol.* 2009;35(1):5–17.
3. Cardis E, Armstrong BK, Bowman JD, et al. Risk of brain tumors in relation to estimated RF dose from mobile phones: results from five Interphone countries. *Occup Environ Med.* 2011;68(9):631–640.
4. Inskip P, Tarone RE, Hatch EE, et al. Cellular-Telephone use and brain tumors. *N Engl J Med.* 2011;244(2):79–86.
5. Lönn S, Ahlbom A, Hall P, Feychting M. Mobile phone use and the risk of acoustic neuroma. *Epidemiology.* 2004;15(6):653–659.
6. CBTRUS. *CBTRUS Statistical Report: Primary Brain and Central Nervous System Tumors in the United States in 2004–2007.* 2011. Source: Central Brain Tumor Registry of the United States, Hinsdale, IL, USA. <http://www.cbtrus.org>.
7. Kundi M. Essential problems in the interpretation of epidemiologic evidence for an association between mobile phone use and brain tumour. *C R Physique.* 2010;11(9–10):556–563.

Notes

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Affiliations of authors: Environmental Health Trust, Berkeley, CA (LLM, RBH, DLD); PowerWatch, Ely, Cambridgeshire, UK (AP).

Correspondence to: L. Lloyd Morgan, BS,
Environmental Health Trust, 2022 Francisco St,
Berkeley, CA 94709 (e-mail: [Lloyd.L.Morgan@
gmail.com](mailto:Lloyd.L.Morgan@gmail.com)).

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