META-ANALYSIS SUGGESTS NO INCREASED BRAIN TUMOR RISK WITH 5 YEARS OF MOBILE PHONE USE

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Madison, Wisconsin---Anna Lahkola and Anssi Auvinen of STUK, Finland’s Radiation and Nuclear Safety Authority, with a colleague at the University of Tampere, recently concluded from a meta-analysis of 12 epidemiologic studies that “the use of mobile phones for up to 5 years does not increase intracranial tumor risk.”

The analyses were based on 2870 cases, of which 748 had at least 2 to 5 years of mobile phone use. A regression analysis yielded “little evidence of an increasing risk of intracranial tumors with duration of mobile phone use,” the authors report.

Lahkola and colleagues chose a priori to base their analyses on a “well-defined exposure group,” that is, subjects with relatively longer mobile phone use, to provide “a sufficient duration of exposure and latency to allow detection of possible effect.” The strength of this approach “outweighed the disadvantage of excluding 50% of the persons in the intermediate exposure category,” they state.

METHODS
Lahkola et al. first identified 19 original articles published before December 1, 2005, that used a case-control or cohort study design, collected individual exposure data, and reported quantitative measures of association plus information needed for confidence interval estimates. They excluded 7 studies for various reasons—mainly the use of mortality rather than incidence endpoint (1 study) and overlapping study participants in several articles based on the same material (e.g., 3 articles by Hardell et al.)


The authors used a statistical approach for combining odds ratios from the 12 included studies that assumes that “all differences between studies are attributable to random variation.” When evidence for non-random differences was noted, they used a “random effects” analysis “which allowed the true risks to vary between studies and assumed a random distribution for these estimates round a common central value.” The authors also applied a statistical test to determine “whether the results of various studies were consistent enough to be combined.”

Lahkola et al. report re-calculating the overall odds ratio for one study to carry it out to two decimal places, and they pooled exposure categories for 4 other studies “to achieve similar exposure classification as in the other
reports.” They pooled different tumor categories in some cases, and when both analog and digital phone use was reported they used digital only in the analysis. It was more common than analog use, they note.

RESULTS
Figures in this paper present the odds ratio (OR) and 95% confidence intervals from 11 of the 12 studies (excluding Hardell 2006, in press) plus the pooled OR estimate, and show results of a sensitivity analysis for a combination of all types of intracranial tumors based on years of mobile phone use. The authors summarize that “the pooled estimate based on the 11 studies was very close to unity, and the upper limit of the confidence interval was below 1.2.”

The pooled OR estimate for all intracranial tumors combined for cumulative hours of phone use was “very close to unity” the authors report, regardless of whether the analysis was of population-based studies or hospital-based studies. Pooled ORs for histologic tumor type were slightly below 1.0 for glioma and meningioma, the authors report, and slightly above 1.0 for acoustic neuroma. They note that the pooled OR for analog phone use was slightly higher than for digital phones.

While they found no evidence of increased risk for temporal or occipital tumors, or for contralateral tumors, Lahkola et al. state that the pooled OR was above 1.0 with “borderline nonsignificance” for ipsilateral tumors, which appeared to be related mainly to ipsilateral gliomas. They point out, however, “the fact that some studies have shown decreased risks on the contralateral side,” suggests that the finding on ipsilateral tumors is likely related to recall bias. They acknowledge that self-reported phone use is inclined to uncertainty due to recall bias and random error, the latter shown in the UK and German INTERPHONE studies [see RF Gateway news of February 16, 2004 and August 26, 2004].


See the archives 8/26/2004: Assessment of Mobile Phone Usage for more about this subject.

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