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Is There a Ten-Year Latency for Cell Phone Tumor Development?

German Interphone Study Points to Long-Term Brain Tumor Risk

Is it a warning sign or a statistical fluke?

This is the question prompted by a new epidemiological study, released on January 26, which shows—once again—that one may be more than twice as likely to develop certain types of tumors after using a cell phone for more than ten years.

A German research team, which is part of the Interphone project, has reported a 2.2-fold increase in the incidence of gliomas, a type of brain tumor, among those who had used a mobile phone for at least ten years. This result is based on small numbers (12 cases and 11 controls) and is short of statistical significance.

Yet, if this new finding were to be confirmed, it would mark the second type of tumor to be associated with long-term cell phone use. This same ten-year threshold has previously been reported by two Swedish teams for acoustic neuroma, a benign tumor of the acoustic nerve.

"This result is very difficult to interpret," Joachim Schüz, the lead author of the new German study, told *Microwave News* in a telephone interview. "I can only say that it's still an open question whether there is a tumor risk for more than ten years of use." Schüz, formerly at the Johannes Gutenberg-University of Mainz in Germany, is now head of the department of statistics and epidemiology at the Institute of Cancer Epidemiology at the Danish Cancer Society in Copenhagen. The paper will appear in the March 15 issue of the *American Journal of Epidemiology,* but is already available on the journal's Web site.

Sweden's Lennart Hardell of Örebro University and Kjell Hansson Mild of the National Institute for Working Life in Umeå have previously reported a higher brain tumor risk after long-term cell phone use.

"I have a hard time believing that [the German result] is a statistical anomaly," Mild said in a telephone interview. "We carried out a pooled analysis with a large number of cases and a clear brain tumor risk emerges after ten years." Mild noted that he sees the highest risk among those who had used phones a total of 2,000-3,000 hours. In a presentation at last summer's Bioelectromagnetics Society meeting, held in Dublin, Mild said that he did not see an increased risk for latencies of less than ten years.

The Interphone project is a major international effort to investigate possible tumor risks associated with the use of mobile phones. Thirteen countries are participating in the project, which is being coordinated by Elisabeth Cardis at the International Agency for Research on Cancer (IARC) in Lyon, France. The U.S. is not among them.

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Is There a Ten-Year Threshold for Tumor Development? *(continued from p.1)*

A number of the other Interphone research groups, including those from Denmark, Sweden and the U.K., have already reported their results. Some observers are interpreting these findings as suggestive of a long-term brain tumor risk, but all this is still quite controversial and clouded by complicated methodological issues. A large part of the problem is that the explosion in the use of mobile phones is a relatively recent phenomenon and the Interphone project has only a handful of cases with ten or more years of cell phone use. (The paper with the complete Interphone findings is due later this year.)

For example, last week, on January 20, a U.K. group released its Interphone results, which also showed that the highest glioma risk was among those who had used mobile phones for more than ten years. (The paper is posted on the *British Medical Journal* Web site.) The increase is relatively small (20%) and not statistically significant, but it stands out because the 13 other tabulated odds ratios (ORs) are strikingly low—all are less than 1. If phones have no effect on tumor development, then all the ORs should have been clustered around 1, with as many greater than 1 as smaller than 1. For this example, an OR<1 would indicate fewer tumors (a protective effect), and an OR>1 more tumors (an adverse effect).

For brain tumors on the same side of the head (ipsilateral), the U.K. risk is 24% higher than expected, but this time the increase is statistically significant. Here too, most of the other reported ORs are less than 1. The OR for contralateral tumors (that is, on the opposite side of the head as the phone was used) is 0.75 and also significant. The British team argues that this apparent protective effect on the contralateral side is most likely an artifact attributable to recall bias. That is, patients with brain tumors would tend to misremember how they used their phones in order to assign a cause for their cancer. Or, to put it another way, the observed higher tumor risk on one side of the head is balanced out by the lower risk on the other side.

But, as we shall see in a moment, there is another possible explanation: Many of the ORs may be artificially low and, if so, the true tumor risk might be higher than presented.

There are some provocative parallels between the U.K. Interphone results and those reported last year by the Swedish Interphone group led by Maria Feychting at the Karolinska Institute in Stockholm. While Feychting also concluded she did not see an elevated brain tumor risk, she did find a 60-80%, non-significant, increased incidence of gliomas on the same side of the head as the phone was used—here again after ten years of exposure.

As in the U.K. study, the vast majority of Feychting's ORs are less than 1. In a letter to the *American Journal of Epidemiology* published last September, Sam Milham, an epidemiologist in Olympia, WA, highlighted this skewed distribution of risks. Only four of 136 calculated ORs presented in a set of the published tables are above 1, Milham wrote. After recalibrating the data to compensate for the low ORs, Milham concludes that the Swedish data "show that ipsilateral cell phone use is associated with brain tumor development." (We should point out that in its response to Milham and others, the Karolinska team notes that it saw no increase in tumors in the regions of the head where radiation exposure is the highest—the temporal and parietal lobes.)

Like Mild, Milham has long maintained that changes in tumor incidence would only follow after at least ten years of radiation exposure. "You would expect a long latency period for solid tumors," he told *Microwave News.*

Indeed, even the press release accompanying the publication of the German study points out that the fact that the greatest glioma risk is observed among the long-term users is the "most plausible" result. While the risk is still hypothetical, the release argues that this finding "demands attention."

What makes the ten-year latency for brain tumors compelling is that the Swedish Interphone group has observed a similar ten-year latency for acoustic neuromas. The Hardell-Mild team has reported a statistically significant increase in the incidence of acoustic neuroma but with a shorter latency—although the risk increased as the number of hours of use went up. (Schüz explained that the German Interphone analysis of the acoustic neuroma data is being carried out by a team at the German Cancer Research Center in Heidelberg and will be published separately at a later date.)

One sees the same pattern of long latencies for the well-known cancer risks associated with tobacco and asbestos. In both cases, epidemiologists have reported no statistically significant increase in lung cancer and mesothelioma, respectively, until there had been at least ten years of exposure.

The German press release is titled "No Increased Risk of Brain Tumors from the Use of Mobile and Cordless Phones." Not surprisingly, those media outlets that picked up the news sounded the all clear and did not address the ten-year latency tumor risk.