Mobile Phone Use and Acoustic Neuromas

To the Editor:

Lönn et al[1] state that a method of laterality analysis used in previous studies of cellular telephones and brain tumors "assumes that tumors are equally likely to occur on the left and right side in the absence of mobile phone exposure." This is incorrect. The significance test for the 2 × 2 case-only laterality table used in prior studies[2–4] is valid even if tumors are more likely to occur on 1 side of the brain in the absence of exposure.[2] The square-root of the odds ratio from the 2 × 2 case-only laterality table estimates the ratio of the acoustic neuroma risk on the telephone-exposed side of the brain to that on the unexposed side. This laterality risk ratio is a measure of the tumorigenic potential of cellular telephone use. The assumption that tumors are equally likely on the left and right in the absence of exposure is only required to transform this laterality risk ratio to the relative risk in cellular telephone users compared with nonusers.[2]

The laterality analysis in the Swedish study[1] begins by dividing cases into a left-sided group and a right-sided group based on the acoustic neuroma location. Each control is then randomly assigned to a case group, with ipsilateral telephone exposure defined with respect to the tumor side in each group. Lönn et al report that 59% of the acoustic neuromas were right-sided tumors; however, they do not report the laterality distribution assumed in their control assignment. Nine cases were excluded from their laterality analysis without explanation, possibly because there were cases with bilateral acoustic neuromas. In the National Cancer Institute study,[2] there were 4 cases with bilateral tumors (all neurofibromatosis patients); 3 had never used a cellular telephone, and 1 was a regular cellular telephone user.

The reporting by Lönn et al of only the numbers of cases with long-term exposure to summarize study size in their Table 4 exaggerates the difference between the Swedish and Danish Interphone studies. In the Danish study,[4] there were 15 controls who had used a cellular telephone for 10 or more years compared with 26 controls in the Swedish study.[1]

Table 4 of Lönn et al highlights an odds ratio estimate from the National Cancer Institute study of 1.9 for more than 5 years of cellular phone use; of the 5 cases who had used cellular telephones for more than 5 years, 2 had tumors on the usual side of cellular telephone use, 2 had tumors on the opposite side of usual cellular telephone use, and 1 had bilateral tumors and was a right-sided cellular phone user. Thus, consideration of laterality of cell phone use does not lend support to a causal interpretation of the elevated odds ratio estimate.

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REFERENCES

1. Lönn S, Ahlbom A, Hall P, et al. Mobile phone use and the risk of acoustic neuroma. *Epidemiology*. 2004;15:653–659.
2. Inskip PD, Tarone RE, Hatch EE, et al. Cellular-telephone use and brain tumors. *N Engl J Med*. 2001;344:79–86.
3. Muscat JE, Malkin MG, Shore RE, et al. Handheld cellular telephones and risk of acoustic neuroma. *Neurology*. 2002;58:1304–1306.
4. Christensen HC, Schüz J, Kosteljanetz M, et al. Cellular telephone use and risk of acoustic neuroma. *Am J Epidemiol*. 2004;159:277–283.

To the Editor:

We read with interest the publication by Lönn et al[1] who studied the association between time since first regular mobile phone use and acoustic neuroma. They found an increased risk of acoustic neuroma among subjects with at least 10 years since first regular use of analog mobile phones (odds ratio [OR] = 1.8; 95% confidence interval [CI] = 0.8–4.3).

If one accepts that acoustic neuroma is a slow-growing tumor initiated years before clinical diagnosis,[2] the only etiologically valid analysis would be among subjects who were exposed to mobile phones at least several years before the reference date. For subjects with few years since first exposure, the exposure cannot be causally involved in the etiology of acoustic neuroma.

Assuming that analog radiofrequency devices increase the risk of cancer, some epidemiologic findings would fit together. Auvinen et al[3] undertook a register-based case-control study on cellular phone and brain tumors in Finland. This study did not have any nonresponse bias or differential exposure misclassification by study design. They found an OR of 2.1 (95% CI = 1.3–3.4) for glioma among subjects ever exposed to analog mobile phones. This ever/never analysis can only suffer from nondifferential exposure misclassification by definition and therefore can be considered as a conservative effect estimate. The same analysis for digital mobile phone use revealed an OR of 1.0 (0.5–2.0).

In our case-control study on uveal melanoma,[4] we found an increased risk among subjects exposed to radio sets that use analog techniques. We therefore started a new case-control study[5] on radiofrequency radiation and uveal melanoma risk, for which we expect results in 2005.

Muscat et al[6] found an increased risk of acoustic neuroma among subjects who used mobile phones for at least 3 to 6 years (the longest interval in their study) in a case-control study in the United States with 88% of all mobile phone users using analog phones.

Furthermore, the recent case-control study of Hardell et al,[7] which has some methodologic limitation, showed increased risks of brain tumors among subjects exposed to analog mobile phones with a latency of more than 10 years.

The study by Lönn et al[1] makes it more difficult to ignore the accumulat-

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