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Letters to the editor

The epidemiology of glioma in adults: a "state of the science" review

This is a wide-ranging and comprehensive study.[1] However, the section "Nonionizing Radiation: Cellular Phones" has serious deficiencies. It cites 3 incidence time trend studies,[2–4] 2 cohort studies,[5,6] and 1 case control study.[7]

Incidence Time Trend Studies

Late ascertainment and poor histological concordance are common accuracy problems. Late ascertainment results in an underestimation of incidence rates in recently reported years. A paper reported: "Results: Initial incidence case counts . . . accounted for only 88%–97% of . . . final counts; it would take 4–17 years for 99% or more of the cancer cases to be reported."[8] Another study reported that the histological concordance by 4 neuropathologists reviewing gliomas was "52% all 4 reviewers, any 3 reviewers, 60%; 2 reviewers, 70%."[9]

The study by Deltour and colleagues[2] reported that glioma rates were stable among the 40–59 age group from 1979 to 2008.[2] The Ostrom authors[1] failed to report a significant increase, ages 20–79, annual percent change (APC) = 0.4%, 95% CI = 0.1%–0.6% in men and APC = 0.3%, 95% CI = 0.1%–0.5% in women.[2] It received funding via a "firewall" from the cellphone companies Telia-Sonera, Telenor, and Ericsson.[10] During the years of this study (1979 to ~1994; 53% of the duration), cellphones did not exist or the prevalence was very low; in 1998 the prevalence was 44%; by 2005 prevalence had reached 100%. With incidence trends over a 30-year period where in most of the years there was almost no cellphone use and with only 3 years of 100% prevalence, how can one conclude whether or not cellphone use was affecting incidence?

The US study by Little and colleagues[3] was for the years 1992–2008.[3] In 1992 cellphone prevalence was 1% and by 2008 it was 84%.[11] A 2013 report noted that the Veterans Administration hospitals had ceased from 2005 to 2014 to report cancer cases diagnosed among military veterans.[12] The result was that 3%–8% of all male cancer cases were missing. In 1992, only 1% of the population were using cellphones, whereas by 2008, use was at 84%. With 3%–8% of male cancers not reported, combined with late ascertainment, how could a change in glioma incidence rates be expected? In spite of these issues, Little et al reported a significantly increased APC in temporal lobe glioma, APC = 0.73%, 95% CI = 0.23%–1.23%. The temporal lobe absorbs the largest proportion of cellphone radiation of any anatomic region of the brain.[13]

The title of the third incidence time trend study cited, "Changes in Brain Glioma Incidence and Laterality *Correlates With Use of Mobile Phones*—a Nationwide Population Based Study" (*emphasis* added),[4] is in direct contradiction to the assertions in the deficient section.

Incidence Time Trend Studies not Cited

A US paper examined cancer incidence across 3 cancer registries for the years 1992–2006.[14] It reported: "Data from 3 major cancer registries demonstrate increased [APC] incidences of GBMs in the frontal lobe, temporal lobe, and cerebellum." These 3 anatomic regions absorb between 81% (900 MHz) and 86% (1800 MHz) of all the cellphone radiation absorbed by the brain.[13]

An Australian paper with 2000–2008 data,[15] though cited in the Ostrom study,[1] was not cited for its time trend results, brain cancer APC = 3.9%, 95% CI = 2.4–5.5.[15] The same team reported: "A significant increasing incidence in glioblastoma multiforme . . . was observed in the study period [APC = 2.5%, 95% CI = 0.4–4.6], particularly after 2006."[16]

For the years 2003–2012 the Danish Cancer Registry reported an increased incidence of male and female brain cancers of 41.2% and 46.1%, respectively.[17]

Cohort Studies

The Ostrom study cited 2 cohort studies as evidence that cellphone use is not a risk for glioma.[5,6] For rare diseases, case control studies are essential. Cohort studies are incapable of determining risks.[18] It is axiomatic that absence of evidence is not evidence of absence. Both studies found significant reduced risks for various cancers.

Case Control Study

A *single* case control study was cited, noting that its odds ratios (ORs) "were markedly elevated in all categories of use."[7]

Case Control Studies not Cited

The Hardell team's significant findings are consistent with what would be expected if wireless phones (cell and cordless) were causing brain cancer:

(i) The higher the cumulative hours of use, the higher the risk.[7,19]
(ii) The longer the time since first use, the higher the risk.[7,19–21]
(iii) The higher the radiated power, the higher the risk.[7,19–21]
(iv) Ipsilateral risk is higher than contralateral risk.[7,19,20,22]

Another study reported brain cancer risk with 1640+ hours of cellphone use compared with <5 hours of use, OR = 1.82, 95% CI = 1.15–2.89; and for 10+ years since use compared with 1–1.9 years since first use, OR = 2.18, 95% CI = 1.43–3.31.[23]

The CERENAT study reported "heavy mobile phone use" (≥896 hours), OR = 2.89, 95% CI = 1.41–5.93; with 5+ years since first

use, OR = 5.30, 95% CI = 2.12–13.23, $P < .001$; and for use exclusively in urban areas, OR = 8.20, 95% CI = 1.37–49.07.[24]

In conclusion, the authors' statement that the "evidence published since the IARC monograph in 2011 does not support an association between cellular phone use and the risk of glioma in adults[1]" requires revision.

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Reply to Letter

Response to "The epidemiology of glioma in adults: a 'state of the science' review"

Mr. Morgan's letter gives us the opportunity to clarify a number of points from our review, but we also need to correct one error.