Cell phones and rats: Study explores radiation exposure

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Credit: Vojko Kalan/public domain

For some years research teams have explored and attempted to sort out any evidence concerning a cause-effect situation with mobile phones and cancer. Interest in the question does not disappear. Scientific groups prefer to welcome more studies than to shoo the question away.

Any talk, however, about those who suspect cell phones as cancer risks and those who dismiss the fears as rubbish is incomplete without looking at a group in the middle, who in the absence of a pure yes or no prefer to continue studying the question about any health risks.

Shaking things up to an extent, in 2011 the World Health Organization's International Agency for Research on Cancer (IARC) classified radiofrequency electromagnetic fields as *possibly* carcinogenic to humans (Group 2B). The category is used when a causal association is considered credible but chance, bias or confounding elements cannot be ruled out with reasonable confidence. In other words, such factors as biases, confounders and errors take away from the strength of the conclusions.

A fact sheet from WHO dated 2014 said, "The electromagnetic fields produced by mobile phones are classified by the International Agency for Research on Cancer as possibly carcinogenic to humans."

On Friday, it became clear again that the question about phones and health links will not go away any time soon. Dina Fine Maron in *Scientific American* relayed what actually happened on Friday:

"Federal scientists released partial findings Friday from a $25 million animal study that tested the possibility of links between cancer and chronic exposure to the type of radiation emitted from cell phones and wireless devices."

This was how reporter Ryan Knutson of *The Wall Street Journal* summarized news of the study.

"The multiyear, peer-reviewed study, by the National Toxicology Program, found 'low incidences' of two types of tumors in male rats that were exposed to the type of radio frequencies that are commonly

emitted by cellphones. The tumors were gliomas, which are in the glial cells of the brain, and schwannomas of the heart."

The National Toxicology Program is under the National Institutes of Health; it is an interagency program and it led the study. NTP's stated goal: safeguarding the public by identifying substances in the environment that may affect human health.

So is there a relationship between exposure to radiofrequency radiation and tumor formation in rats?
The research was performed on male rats, with experiments on multiple groups of 90 rats, said *Scientific American*; rats were exposed to radio-frequency radiation at 900 megahertz.

According to the *Scientific American* report, the study chronicled rodents subjected to a lifetime of electromagnetic radiation starting in utero.

The animals exposed to RF had a greater chance of being diagnosed with malignant glioma type of brain cancer, as well as developing a tumor found on the heart. "The incidence grew with greater levels of exposure to the radiation. Some of the rats had glioma—a tumor of the glial cells in the brain —or schwannoma of the heart," said Maron.

(The two tumor types, malignant gliomas of the brain and schwannomas of the heart were the focus.)

The rats were exposed to "carefully calibrated radiofrequency (RF) radiation levels designed to roughly emulate what humans with heavy cell phone use or exposure could theoretically experience in their daily lives," said Maron.

Exposure involved their whole bodies with radiation for approximately nine hours per day throughout their two-year lifespans, she added.

Why nobody wants to walk away from the question any time soon—*Scientific American*'s report said that "More than 90 percent of American adults use cell phones. However, relatively little is known about their safety because current exposure guidelines are based largely on knowledge about acute injury from thermal effects, not long-term, low-level exposure."

No, the study is not likely to end the discussions. The study is, however, likely to keep the curiosity fire burning.

According to the Environmental Working Group: "David Carpenter, director of the School of Public Health at State University of New York at Albany, who has followed the issue closely, said the study 'won't end the debate, but I can't imagine anything with more credibility than an NTP report.'"

Carpenter also said he thought the report could spur other health organizations to take a fresh look at the issue.

Dina Fine Maron had her assessment, saying it was "the strongest evidence to date that such exposure is associated with the formation of rare cancers in at least two cell types in the brains and hearts of rats."

It should be noted that the NTP report is on partial findings, limited to select findings of concern in the brain and heart. The study said that it does not represent a complete reporting of all findings from these studies of cell phone RFR. Complete results for NTP studies on the toxicity and carcinogenicity of GSM and CDMA modulated RFR are being reviewed and will be reported with current findings later on. Draft NTP Technical Reports are expected to be available for peer review and public comment later next year.

More information: biorxiv.org/content/biorxiv/ea …

5/26/055699.full.pdf

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