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Lancet

International Agency for Research on Cancer classifies radiofrequency electromagnetic fields (including those caused by mobile phones) as possibly carcinogenic to humans

The Lancet Oncology today publishes a summary from a meeting of the International Agency for Research on Cancer (IARC), that classifies radiofrequency electromagnetic fields (RF-EMF) (including those caused by mobile phones) as possibly carcinogenic to humans (division 2B in the IARC classification).

30 scientists from 14 countries met in Lyon, France, at the end of May, 2011, to discuss the evidence surrounding RF-EMF and cancer. The working group was chaired by Dr Jonathan Samet, Chair of Preventive Medicine at the University of Southern California's Keck School of Medicine.

Human exposures to RF-EMF (frequency range 30 kHz– GHz) can occur from use of personal devices (eg, mobile telephones, cordless phones, Bluetooth, and amateur radios), from occupational sources (eg, high-frequency dielectric and induction heaters, and high-powered pulsed radars), and from environmental sources such as mobile-phone base stations, broadcast antennas, and medical applications. The general population receives the highest exposure from transmitters close to the body, such as mobile telephones. The authors note in their summary that third-generation (3G) mobile phones emit about 100 times less RF energy than global system for mobile communications (GSM) handsets, when signals are strong. They also highlight that the average output power of Bluetooth wireless hands-free kits is estimated to be around 100 times lower than that of mobile phones.

The conclusion of the IARC working group that RF-EMF is possibly carcinogenic to humans is based on several studies. In the INTERPHONE study (published in 2010), researchers found that overall, those having ever used a mobile phone appeared to be at a slightly lower risk of developing glioma (a brain tumour) than those who never had. However, when the top 10% of mobile phone users in terms of call time were analysed (total exposure 1640 hours and over), that group was found to have a 40% increased risk of glioma compared with never-users. There also a suggestion of increased risk for ipsilateral exposure (where mobile phone use was on the same side of the head as the tumour) and for tumours in the temporal lobe, where RF exposure is highest.

Associations between glioma and cumulative specific energy absorbed at the tumour location were also examined in INTERPHONE, in a subset of 553 cases that had estimated RF doses. The risk of glioma increased with increasing RF dose for exposures 7 years or more before diagnosis, whereas there was no association with estimated dose for exposures less than 7 years before diagnosis.

The working group also reviewed a combined analysis of Swedish studies (published in 2011) in which participants who had used a mobile phone for more than 1 year had a 1.3 times (or 30%) increased risk of gliomas, when compared with never users. This increased with increasing time since first use and with total call time, reaching 3.2 times increased risk for more than 2000 hours of use. Ipsilateral use of the mobile phone was associated with higher risk.

The authors say: "Although both the INTERPHONE study and the Swedish pooled analysis are susceptible to bias—due to recall error and selection for participation— the Working Group concluded that the findings could not be dismissed as reflecting bias alone, and that a causal interpretation between mobile phone RF-EMF exposure and glioma is possible."

A Danish study that analysed cancer rates and mobile phone subscription from 1982 to 1995 found no increased risk of glioma or other brain tumours among mobile phone users, nor did a number of earlier and smaller case control studies. This and other evidence led to the findings of the working group not being agreed by all its members. The authors say: "A few members of the Working Group considered the current evidence in humans 'inadequate'. In their opinion there was inconsistency between the two case-control studies and a lack of an exposure-response relationship in the INTERPHONE study results; no increase in rates of glioma or acoustic neuroma was seen in the Danish cohort study, and up to now, reported time trends in incidence rates of glioma have not shown a parallel to temporal trends in mobile phone use."

Overall, the authors conclude: "In view of the limited evidence in humans and in experimental animals, the Working Group classified RF-EMF as 'possibly carcinogenic to humans' (Group 2B).

This evaluation was supported by a large majority of Working Group members."

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For full Summary, see: <http://press.thelancet.com/tloiarcsum.pdf>

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