

Editorial

Mobile cellular telephones and children

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The use of mobile cellular telephones, also known as cell phones and mobile phones, by children has in recent years been increasing, the onset starting earlier and earlier. This has led to concern about whether children might be at higher risk and whether mobile phone use should even be curtailed in children. Certainly for parents, giving children mobiles help to keep tabs on them when they are out and about in a world full of hazards. However, if the hazard is the phone itself, then we would be wise to take precautions. In July 2009 Sri Lankan Ministry of Education banned students from taking mobile phones to school after a 14-year-old girl hanged herself after being reprimanded over a telephone contact with a boy during school¹.

Cell phones emit radiofrequency energy, a form of non-ionizing electromagnetic radiation, which can be absorbed by tissues closest to where the phone is held. The amount of radiofrequency energy to which a cell phone user is exposed depends on the technology of the phone, the distance between the antenna of the phone and the user, the extent and type of use and the distance of the user from cell phone towers². Electromagnetic radiation can be categorized into two types viz. ionizing (e.g. x-rays) and non-ionizing (e.g. radiofrequency)³. Exposure to ionizing radiation is known to increase the risk of cancer. There is no consistent evidence that non-ionizing radiation increases the cancer risk³. It is accepted that DNA damage is necessary for development of cancer. However, radiofrequency energy, unlike ionizing radiation, does not cause DNA damage in cells and has not been found to cause cancer in animals or to enhance the cancer-causing effects of known chemical carcinogens in animals⁴⁻⁶.

Theoretically, children are potentially at greater risk for developing brain cancer from cell phones than adults. Their developing nervous systems are more vulnerable to factors that may cause cancer. Their smaller heads have a greater proportional exposure to the field of radiofrequency radiation emitted by cell phones. Furthermore, children have the potential of accumulating more years of cell phone exposure than adults². So far, data from clinical studies in children do not support this theory. Aydin et al⁷ provide

results from the first study specifically designed to address cell phone use among children and adolescents diagnosed with brain tumours. They conducted a case-control study of children and adolescents 7 to 19 years of age in Denmark, Norway, Sweden, and Switzerland. Three hundred and fifty two children who were diagnosed in 2004-2008 with a brain tumour were identified from various clinic- and population-based registry records and 646 controls were randomly selected from the general population. Cell phone use was estimated based on face-to-face interviews with a parent present and from cell phone subscriber records when available. Researchers did not find an association between cell phone use and risk of brain tumour in this group of children. However, they noted that their results did not rule out the possibility of a slight increase in brain cancer risk in children who use cell phones, and that data gathered through prospective studies and objective measurements, rather than participant surveys and recollections, will be key to clarifying whether there is an increased risk⁷.

The U.S. Food and Drug Administration and the Federal Communications Commission have suggested some steps that cell phone users can take to reduce their exposure to radiofrequency energy³.

- Reserve cell phone use to shorter conversations or when a landline phone is not available.
- Use a hands-free device placing more distance between the phone and the head of the user

The Danish National Birth Cohort (DNBC) looked at prenatal and postnatal exposure to cell phone use and behavioural problems at age 7 years. Mothers were recruited to the DNBC early in pregnancy. When the children of those pregnancies reached 7 years of age in 2005 and 2006, mothers were asked to complete a questionnaire regarding the current health and behavioural status of children, as well as past exposure to cell phone use. Mothers evaluated the child's behaviour problems using the Strength and Difficulties Questionnaire. The authors of the study concluded that exposure to cell phones prenatally, and to a lesser degree postnatally, were associated

with behavioural difficulties at around 7 years of age⁸. A larger, separate group of DNBC children produced similar results after considering additional confounders. This new dataset consisted of 28,745 children with completed age-7 questionnaires to December 2008. The highest Odds Ratio for behavioural problems were for children who had both prenatal and postnatal exposure to cell phones compared with children not exposed during either time period. The adjusted effect estimate was 1.5 (95% CI 1.4 to 1.7)⁹.

One study investigated the potential effects of a standard 902MHz global system for mobile communication mobile phone on the cognitive function of 10-14 year old children. A total of 32 children performed a battery of cognitive tests twice, once while exposed to an active mobile phone and once during exposure to an inactive phone. The statistical analyses showed no significant differences between the mobile phone off and on conditions in reaction times and accuracy over all tests or in any single test. It was concluded that a standard mobile phone has no effect on children's cognitive function as measured by response speed and accuracy¹⁰.

In another study¹¹ seventy seven children aged 10 to 11 years completed simulated road crossings in a virtual pedestrian environment. Children crossed the virtual street 6 times while undistracted and 6 times while distracted by a cell phone conversation. While distracted, children were less attentive to traffic, left less safe time between their crossing and the next arriving vehicle, experienced more collisions and close calls with oncoming traffic and waited longer before beginning to cross the street¹¹.

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