How Dangerous Is Electromagnetic Radiation?

By Junu Bryan Kim

What characteristic is shared by an electric blanket, a power line, and a broadcast tower?

All three emit electromagnetic radiation.

These invisible electromagnetic fields are known as EMFs.  They are generated by currents running through electric wires.  Since they are not powerful and destructive like nuclear or X-ray radiation, they were once thought to be harmless.  However, studies have suggested that people exposed to them chronically run a higher risk of certain health problems, including miscarriages, learning disabilities, and cancer.

No clear cause-and-effect relationship has been established between EMFs and illnesses, but the mounting evidence makes EMFs appear to be extremely suspicious.  And because EMFs are generated by many sources -- including microwave ovens, televisions and radios, military radar systems, and, ironically, some treatments for cancerous tumors -- many of us could be at risk.

Studies over the last 15 years have hinted at a connection between EMFs and health problems.  EMFs have been implicated in behavioral changes, birth defects, memory loss, and Alzheimer's disease.  In 1976, two doctors at the Veteran's Administration Hospital in Syracuse, N.Y. showed that the offspring of mice exposed to extremely low-frequency EMFs from power lines were born stunted.

In their attempts to establish a cause-and-effect connection between EMF exposure and health problems, scientists have been trying to uncover just what effect EMFs have on the body.  One theory is that EMFs of certain frequencies disrupt the normal role of calcium in the brain.  Another theory says that EMFs affect how cells grow and reproduce.  A third belief holds that EMFs make cells manufacture proteins they normally would not reproduce.

Researchers who believe in the EMF-illnesses connection have their critics.  These skeptics emphasize that there is no proven cause-and-effect link between EMF exposure and cancer.  At a Florida state government hearing on power line emission standards, Philip Cole, MD, an epidemiologist (a researcher who studies the occurrence and control of a disease) at the University of Alabama, Birmingham, emphasized this absence of proof.  Without a proven connection, Cole asserted, "There is no relationship between EMFs and cancer in human beings, or if there is an effect it must be of very low magnitude, even among people who are moderately to heavily exposed."

Other studies have focused specifically on the suspected connection between EMF exposure and cancer.  In 1979, two University of Colorado researchers, physician Nancy Wertheimer and physicist Ed Leeper, pored through childhood mortality records in the Denver area and correlated long-term exposure to weak EMFs with a higher incidence of cancer.  Seven years later, Dr. Lennart Tomenius, a Swedish researcher, found the same relationship between EMF exposure and cancer rates among children in Stockholm.  And in 1982, Samuel Milham, an occupational health physician in the Washington State Department of Social and Health Services, noted in the *New England Journal of Medicine* that he found more leukemia-related deaths in men whose work brought them in contact with electrical and magnetic fields, such as employees of utility companies.

Furthermore, EMFs have been implicated in pregnancy problems.  In 1986, Wertheimer and Leeper reported that women who used heated waterbeds or electric blankets, both of which emit EMFs had longer pregnancies and a higher miscarriage rate.  And in 1987, Kurt Salzinger, a psychology professor at the Brooklyn-based Polytechnic Institute of New York, found that rats exposed to EMFs for 30 days had more problems than unexposed rats in learning to press a bar on command.  Their offspring, exposed in the womb and for nine days after birth, developed permanent learning disabilities.

Indeed, studies on diseases occasionally have the difficulty of trying to prove a causal link when researchers must rely on past records and events instead of controlled experiments.  However, this lack of proof has not stopped lawyers from introducing available studies as evidence in EMF-related lawsuits.  The judgments in several such suits were based on research showing a possible connection and not a definite link.  In late 1985, a Texas jury ordered the Houston Lighting and Power Company to pay a local school district $25 million in punitive damages after the utility built a transmission line through school property without the district's permission.  In Florida, juries have awarded more than $1 million to owners of land next to high-voltage lines.

Another suit illustrates the potential effects of transmission lines and the EMFs they create on home owners trying to sell their homes.  About 60 landowners in New York state filed a $60 million suit against the New York Power Authority, alleging that a half completed power line from Canada into the state could produce a "cancer-phobia corridor" where property values would tumble.

This fear of diminished property values brings up the question of what the general public can do to protect itself from this potential threat.  EMFs are not like other harmful agents.  They have not been proven dangerous, as has the outlawed, cancer-causing food coloring Red Dye #2, for example.  In addition, unlike Red Dye #2 and other proven carcinogens, EMFs are almost unavoidable.  The magnetic fields easily, penetrate walls and bodies, and as of now, no protective shield is available.

With such a pervasive yet mysterious force around us, there's not much we can do to totally eliminate EMF exposure.  There are ways, though, of minimizing our potential risks:

* Unplug and do not use electric blankets.
* Don't sit less than five feet from televisions.
* Don't allow people to peer through the doors of microwave ovens when they're on.
* If you're pregnant, minimize the use video-display terminals (VDTs).
* Avoid taking jobs or living in areas where EMF exposure could be high.  The people at greatest risk are utility workers and those near transmission lines.  (No study has established a "safe minimum distance" from power lines.)

Though EMFs have not been proven dangerous, the evidence clearly points to an association between them and health problems, and individuals have reason to be concerned.