News in Science - Study spells out x-ray risk, not benefit - 30/01/2004

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Study spells out x-ray risk, not benefit

Lucy Andrew
ABC Science Online

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X-rays may be responsible for more than 400 cases of cancer in Australia a year, researchers have estimated.

The researchers calculated the lifetime risk of developing cancer from having a diagnostic x-ray like this *(FDA)*

But critics said these estimates were not balanced against the benefits of x-rays, namely the early detection of treatable disease.

Dr Amy Berrington de González and Professor Sarah Darby from the U.K.'s University of Oxford, estimated the risk of developing cancer from diagnostic medical x-rays over a person's lifetime.

These estimates, which appear in today's issue of the journal *The Lancet*, formed part of the most detailed study of its kind.

The researchers compared data from 15 countries, including Australia, and accounted for differences due to the type of cancer as well as people's age and sex.

They estimated that x-rays were responsible for a 0.6-3.2% risk of developing cancer during a person's lifetime. The risk depended on where that person lived.

For Australians, they estimated that risk was 1.3%, which placed Australia in the top four countries with the highest risk, along with Japan, Germany and Croatia.

That 1.3% risk was equivalent to an extra 431 cancer cases a year in Australia, the researchers said.

To calculate the risks, the U.K. researchers calculated the amount of radiation each organ in the body would be exposed to during an x-ray and computed tomography, or a CT scan. CT scans use a series of x-ray images to create a three-dimensional image of the inside of the body.

The researchers also calculated the risk of developing different types of cancer from radiation, based on the incidence of cancer from survivors of the Japanese atomic bomb.

The researchers combined the radiation and cancer data to work out the lifetime risk and number of cancers a year x-rays cause.

The U.K. and Poland had the lowest lifetime risk (0.6%) of developing cancer due to having an x-ray.

People in Japan had the highest risk (3.2%), which the researchers said was down to x-rays being more commonly used in Japan than in other countries.

But x-rays were not widely used in Australia compared with other countries, yet Australia had one of the highest risks. The researchers did not explain this result.

Computed tomography scans

CT scans were responsible for the most cases of cancer, the researchers estimated. Barium enemas used to view the large intestine, were also attributed to a higher risk.

But German researchers Dr Peter Herzog and Dr Christina Rieger from the Ludwig-Maximillians-University in Munich criticised the way the study was designed in a commentary appearing in the same issue of journal.

They also criticised the researchers for not accounting for the benefits of using x-rays.

"Benefits include the earlier detection of cancers by radiological examinations and the possibility of early treatment, which probably allows more cure of cancers than radiological exposure is able to cause," they said.

use a series of x-ray images *(FDA)*	Using data from survivors of the Japanese atomic bomb may not have been appropriate, they said, as survivors would have been exposed to other types of radiation not used in x-rays.

The U.K. researchers were aware of the limitations of their own study. They assumed even small doses of radiation could cause cancer and these low doses were as harmful as high doses of radiation.

"The possibility that we have overestimated the risks cannot be ruled out," they said.

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