

Is it time to investigate radiation hormesis as a method of reducing cancer mortality?

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The health effects of low dose radiation are still being debated. The prevailing view in the scientific community is the linear no-threshold (LNT) model according to which even the smallest amount of radiation may damage DNA causing mutations and increasing the risk of cancer. The contrary view is that of radiation hormesis whereby dose radiation low stimulates the defensive mechanisms in the body resulting in a reduced risk of cancer. Whereas many human epidemiological studies have shown evidence for radiation hormesis, the atomic bomb survivor data, which is considered to be the most important data for estimating cancer risk of radiation, has thus far appeared to be consistent with the LNT model, and the scientific community has generally dismissed the idea of radiation hormesis. The recent updated report on the atomic bomb survivors has shown a significant reduction in cancer mortality rate at colon dose of 0.5 Gy in comparison to a linear fit to the data. The radiation hormesis model is able to explain this shape of dose response whereas the LNT model cannot. Though there has been a tremendous amount of reported progress in understanding, diagnosing and treating cancer in the past several decades, the clinical results have been quite disappointing, as age adjusted cancer mortality rates have declined by only ~8% in the past fifty years. Hence, it may be prudent to investigate the phenomenon of radiation hormesis as an alternative approach to reduce cancer mortality, as our present approaches have apparently failed.

Biography

Mohan Doss has a PhD in Physics from Carnegie-Mellon University, and has certification as a Member of Canadian College of Physicists in Medicine, in Nuclear Medicine Physics. He has provided physics support for nuclear medicine in Regina Health District in Canada from 1990 to 2001. Since 2001, he has been at Fox Chase Cancer Center providing physics support for diagnostic imaging and radiation safety. His research interests include PET/CT imaging with novel radiotracers, and health effects of low dose radiation.

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