Radiation-Induced Breast Cancer Risk from Screening Mammograms

Women should not worry that regular screening mammograms would increase their risk of radiation-induced breast cancer.

The risk of radiation-induced breast cancer and breast cancer death due to mammographic screening is minimal, according to a study published in the journal *Acta Radiologica*.

Researchers from Norway sought to estimate the potential number of radiation-induced breast cancers, radiation-induced breast cancer deaths, and lives saved due to implementation of organized mammographic screening.

Data for the study were collected from the Norwegian Breast Cancer Screening Program (NBCSP), a population-based screening program that provides two-view mammograms every two years to women aged 50 to 69.

Estimates were calculated for 100,000 women, aged 50 to 69, with a screening interval of two years, and with an assumed follow-up until the age of 85 or 105. Radiation doses of 0.7, 2.5, and 5.7 mGy per screening examination, a latency time of five or 10 years, and a dose and dose-rate effectiveness factor (DDREF) of 1 or 2 were applied.

“In 1995, before the NBCSP started, 1,548 breast cancers were detected among the 703,122 women aged 50 to 85 years residing in Norway, i.e. a breast cancer rate of 220 per 100,000,” the authors wrote. “If we assume an incidence rate of 220/100,000 during a time-span of 36 years (age 50 to 85 years), we will have 7,920 breast cancer cases (220 x 36) among 100,000 women.”

The results of the study showed that a total lifetime risk of radiation-induced breast cancers per 100,000 women was 10 among those women who were followed from the ages of 50 to 85, for a dose of 2.5 mGy, a latency time of 10 years, and a DDREF of 1. For the same parameter values the number of radiation-induced breast cancer death was one. The assumed number of lives saved was estimated at 350.

The researchers concluded that the linear no-threshold (LNT) model resulted in 30 or fewer radiation-induced breast cancers for 100,000 women aged 50 to 69 who were screened 10 times, once every two years, and if they were followed for breast cancer until the age of 105. “It should thus be safe to conclude that the risk of radiation-induced breast cancer and breast cancer death as a result of organized screening is considered minimal when applying a screening program according to the European guidelines.”

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