

Red Meat Linked to Hormone Receptor-Positive Breast Cancer

BOSTON, Nov. 14 -- A diet heavy on red meat may increase the risk of hormone receptor-positive breast cancer in premenopausal women, researchers said.

Action Points

Caution patients that the analysis found increased risk associated with red meat intake only for hormone receptor-positive cancer and only looked at premenopausal women.

However, beef, pork and lamb intake had no effect on hormone receptor-negative or overall breast cancer risk (both $P=0.28$ for trend), said Eunyoung Cho, Sc.D., of Brigham and Women's Hospital and Harvard, and colleagues, in the Nov. 13 *Archives of Internal Medicine*.

They conducted an analysis of the Nurses' Health Study II, including 90,659 women (baseline age 26 to 46, average 36) followed prospectively for 12 years with periodic food questionnaires. Postmenopausal women were excluded or dropped from the analysis.

Estrogen and progesterone receptor positive breast cancer risk showed a significant trend for increasing red meat intake ($P=0.001$). Compared with three or fewer servings a week, the researchers reported multivariate-adjusted relative risks:

1.14 for between three and five servings per week (95% confidence interval 0.90 to 1.45),

1.42 for between five servings per week and one per day (95% CI 1.06 to 1.90),

1.20 for between one and 1.5 servings per day (95% CI 0.89 to 1.63), and

1.97 for more than 1.5 servings per day (95% CI 1.35 to 2.88).

The link between red meat and breast cancer has long been tenuous, with inconsistent findings in previous studies.

However, "given that most of the risk factors for breast cancer are not easily modifiable, these findings have potential public health implications in preventing breast cancer and should be evaluated further," Dr. Cho and colleagues wrote.

Among the 1,021 cases of invasive premenopausal breast cancer that occurred during the trial, relatively few were hormone-receptor negative (167 versus 512 ER+/PR+). In these cases, though, the relationship to red meat intake was significantly different than that for hormone receptor- positive disease ($P=0.01$).

Compared with three or fewer servings of red meat per week, the relative risk of hormone receptor negative breast cancer was::

1.34 for between three and five servings per week (95% CI 0.89 to 2.00),

1.21 for between five servings per week and one per day (95% CI 0.73 to 2.00),

0.69 for between one and 1.5 servings per day (95% CI 0.39 to 1.23), and

0.89 for more than 1.5 servings per day (95% CI 0.43 to 1.84).

Overall breast cancer risk relative to intake was 1.03 (95% CI 0.87 to 1.21), 1.10 (95% CI 0.90 to 1.35), 0.96 (95% CI 0.78 to 1.19), and 1.27 (95% CI 0.96 to 1.67), respectively.

The relationships remained consistent when grams of intake were analyzed rather than servings, when quintiles of intake were examined, and when adjusted for other food groups like vegetable intake.

All relative risks reported were adjusted for tobacco use, body mass index, height, age at menarche, oral contraceptive use, family history of breast cancer, history of benign breast disease, parity and age at first birth, and intakes of calories and alcohol.

The participants who ate more red meat were also more likely to be current smokers, to have three or more children, and to have a higher body mass index and caloric intake but less likely to have a history of benign breast disease.

The researchers postulated that red meat may increase hormone receptor positive breast cancer through components such as carcinogenic heterocyclic amines, tumor-inducing heme iron, and exogenous hormone residues.

"Because hormonal risk factors are more strongly related to hormone receptor positive cancers, meat intake may operate through hormonal pathways," the researchers wrote.

The study was supported by the National Institutes of Health.

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Cho E, et al "[Red Meat Intake and Risk of Breast Cancer Among Premenopausal Women](#)" *Arch Intern Med.* 2006; 166:2253-2259.