Reviewer's report

Title: Physical activity and the risk of postmenopausal breast cancer - the Norwegian Women and Cancer Study

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Borch et al. performed a prospective cohort study to assess the effect of physical activity (PA) on risk of postmenopausal breast cancer, using the data from the Norwegian Women and Cancer Study. Results from this study adjusted most of the known risk factors for breast cancer, like age at menarche, age at first birth, parity, age at menopause, history of breast cancer in the participant’s mother, exogenous hormone use, BMI, height, alcohol consumption and cigarette smoking. A 20% significantly reduced risk of breast cancer overall associated with consistently low PA level at age 14, age 30 and at enrollment (34-70 years) was found.

The results are contrary to the belief that PA could significantly reduce the risk of breast cancer. To date, another 2 prospective studies on PA and risk of breast cancer conducted in Norway were also published. While the results from the women’s lifestyle and health study (Cancer Epidemiol Biomarkers Prev 2005;14:27–32) also found an increased risk of premenopausal breast cancer [1.24 (0.85-1.82)] for vigorous PA, the follow-up of 13.7 years from the national health screening service (N Engl J Med 1997;336:1269–1275) found an significantly reduced risk of breast cancer for regular exercise [0.63 (0.42-0.95)] and heavy manual labor [0.48 (0.25-0.92)]. Furthermore, consistently active vs. consistently sedentary conferred an relative risk of breast cancer of 0.67 (0.40-1.10), and the risk of breast cancer for consistently active vs. consistently sedentary was 0.23 (0.09-0.60) for BMI <22.8 kg/m2, 0.83 (0.33-2.09) for BMI, 22.8-25.7, and 1.38 (0.60-3.17) for BMI >25.7 (N Engl J Med 1997;336:1269–1275). However, no significant interaction of BMI with PA levels and risk of breast cancer was found in this study.

The recent meta-analysis suggested that high level of PA performed among subjects aged >50 years conferred an stronger protection than subjects <25 years (Breast Cancer Res Treat 2013;137:869-882). Although the mechanism for this effect difference was not fully understand, findings from this study revealed that changes in PA levels might partially contribute to this discrepancy. The changes in PA levels (%) from active to inactive/inactive to active was found increasing with increased duration of periods of life. And the trend of association shown in table 3 was also consistent with that from the meta-analysis (Breast Cancer Res Treat 2013;137:869-882). However, the stratified results by ER/PR shown in table 4 were too discrepant to drawn a conclusion.

This study was well-designed itself and this paper was well-written.
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.