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The randomized controlled BENEFIT trial investigating the effects of aerobic or resistance exercise concomitant to neoadjuvant chemotherapy on clinical outcomes in women with breast cancer

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Rationale: Preclinical and observational evidence suggests that exercise may enhance primary tumor treatment, but evidence from clinical trials is scarce. We therefore conducted a randomized controlled trial to examine the effects of adding exercise to neoadjuvant chemotherapy (NACT) on clinical outcomes.

Methods: In the BENEFIT trial, breast cancer patients scheduled for NACT were randomized 1:1:1 to supervised resistance training (RT, n=60), supervised aerobic training (AT, n=60), each performed twice weekly during NACT, or a waitlist control group (WCG, n=60). Clinical records were used to obtain data on change in tumor size (primary endpoint, categorized) as well as pathologic complete response (pCR), need for axillary lymph node dissection (ALND), premature chemotherapy discontinuation, and relative chemotherapy dose intensity (RDI). Analyses were conducted using multiple (ordinal) logistic regression models.

Result: While there was no overall significant difference in post-intervention tumor size between RT or AT and WCG, there was a significant effect modification by hormone receptor (HR) status (p-interaction=0.030). Among patients with HR-positive tumors, results suggest a beneficial effect of AT on tumor shrinkage (odds ratio (OR) = 2.37; 95%CI: 0.97–5.78), on pCR (OR=3.21; 0.97–10.61); and on ALND (OR=3.76; 0.78–18.06) compared to WCG. Effects of RT were slightly less pronounced. For HR-negative tumors, beneficial effects on RDI were found for AT (OR=3.71; 1.20–11.50) and similarly for RT (OR=2.58; 0.88–7.59). Both AT and RT reduced premature discontinuation of chemotherapy (OR (no vs. yes) = 2.34; 1.10–5.06), irrespective of tumor receptor status.

Discussion: The findings suggest that incorporating aerobic and resistance exercise during NACT may beneficially influence tumor shrinkage and pCR rates, lower the need for ALND in patients with HR-positive breast cancer, and help prevent low RDI in those with HR-negative disease. Together, these results highlight the importance of offering supervised exercise already during NACT to support treatment effectiveness and tolerance.

Keywords

supervised exercise; neoadjuvant chemotherapy; tumor response; clinical cancer outcomes

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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