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The influence of exercise on the relationship between neuropathic pain and its interference with daily activities among cancer patients receiving chemotherapy

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Introduction. Chemotherapy-related neuropathic pain (i.e., hot/burning or sharp/shooting sensations) substantially interferes with cancer patients' ability to perform daily activities. Exercise is a promising therapy that may reduce neuropathic pain and its interference with daily activities during chemotherapy.

Methods. We conducted a nationwide phase II randomized controlled trial through the University of Rochester Cancer Center NCI Community Oncology Research Program Research Base. Patients receiving neurotoxic chemotherapy were randomized to Exercise for Cancer Patients (EXCAP[®]) or usual care (UC). EXCAP[®] is a 6-week individually tailored exercise prescription including daily walking and resistance band exercises. Participants rated neuropathic pain severity and its interference with daily activities on 0-10 numerical rating scales daily for six weeks. Linear mixed models adjusted for baseline values assessed changes in neuropathic pain, interference with daily activities, and their association across six weeks.

Results. We recruited 114 participants from 37 community oncology practices across the US (mean age 59±10; 75% female; 36% breast cancer; 37% gastrointestinal cancer). During the intervention, EXCAP[®] participants significantly increased daily steps by 1664±242 ($p<0.01$) and performed 99±9 minutes/week of resistance band exercises at low intensity (perceived exertion 4.5/10). UC participants showed no significant change in daily steps (399±210, $p=0.07$) and performed minimal resistance exercise (8±3 minutes/week). From baseline to post-intervention, EXCAP[®] participants reported significant reductions in neuropathic pain (-0.6 ± 0.01 , $p<0.01$) and interference with daily activities (-0.9 ± 0.02 , $p<0.01$), while UC participants reported no changes (both $p>0.05$). Neuropathic pain was positively associated with interference with daily activities (0.3 ± 0.02 , $p<0.01$). However, EXCAP[®] participants reported less interference with daily activities than UC participants at comparable neuropathic pain severity levels (difference in slope: -0.2 ± 0.04 , $p<0.01$).

Conclusions. Exercise reduces neuropathic pain and its interference with daily activities among patients receiving chemotherapy. Moreover, exercisers experience less interference with daily activities than non-exercisers, even when experiencing the same severity of neuropathic pain.

Keywords

Cancer, exercise, chemotherapy-related neuropathic pain, interference with daily activities

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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