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Specific exercise is more effective than medication – prevention and treatment of Chemotherapy-induced peripheral neuropathy –State of the art

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Chemotherapy-induced peripheral neuropathy (CIPN) is a highly prevalent and clinically relevant side-effect that not only diminishes patients'quality of life but can also impact their medical treatment and survival. The side effects are burdensome, difficult to treat, and often become chronic. Currently, there are no effective pharmacological treatment options available. A meta-analysis has shown that specific exercise is promising in reducing symptoms (Streckmann et al. 2021). In a prospective, multicenter, randomized clinical study (STOP) (Streckmann et al. 2024), we were now also able to show, that sensorimotor training can prevent CIPN by as much as 70%.

We recruited N=158 patients undergoing treatment with either oxaliplatin or vinca-alkaloids from four center (Cologne, Germany) over 5 years. Patients were randomly assigned in a 1:1:1 ratio to one of three groups: SMT (N=55), WBV (N=53), or treatment as usual (TAU) (N=50). Primary endpoint was the incidence of CIPN. Secondary endpoints included subjective neuropathy symptoms, balance control, physical activity levels, quality of life, and clinical outcomes.

In the intention to treat analysis, CIPN incidence was significantly lower in both intervention groups compared to the control group [SMT=30% (95% CI=17.9-42.1%) and WBV=41.2% (27.9-54.5%) vs. TAU=70.6% (58.0-83.2%); pMH=0.0016]. Patients receiving vinca-alkaloids and engaging in SMT benefited most (pFisher=0.008). In the per-protocol analysis (> 75% adherence to the intervention), the differences were even more pronounced [SMT=28.6% (11.9-45.3%) and WBV=37·5% (18.1-56.9%)vs. TAU=73.3% (59.6-87.0%)]. Furthermore, SMT showed significant benefits over TAU in several secondary endpoints, including balance control [bipedal eyes open (pMH=0.04); bipedal eyes closed (pMH=0.049); monopedal (pMH=0.031)], vibration sensitivity (pMH=0.018), sense of touch (pMH=0.042), lower leg strength (pMH=0.043), pain reduction (pMH=0.048), burning sensation (pMH=0.048), chemotherapy dose-reductions (pMH=0.039) and mortality rates (pMH=0.044).

This study provides initial evidence that neuromuscular training can prevent symptoms of CIPN. Specific exercise is consequently a promising option for the treatment and prevention of CIPN.

Keywords

Neuropathy, Exercise, Neuromuscular, Oncology

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

Author: STRECKMANN, Fiona (Department of Sport, Exercise and Health, University of Basel, Basel, Switzerland; Department of Oncology, University Hospital Basel, Basel, Switzerland)

Presenter: STRECKMANN, Fiona (Department of Sport, Exercise and Health, University of Basel, Basel, Switzerland; Department of Oncology, University Hospital Basel, Basel, Switzerland)

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