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Tumor blood flow at rest and during exercise in breast cancer patients

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INTRODUCTION
It has been suggested that exercise during chemotherapy drug infusions might be beneficial for cancer patients. The rationale is that pre-clinical studies have shown increased tumor blood flow during exercise, which could enhance drug delivery into the tumor. However, this phenomenon remains sparsely investigated in the clinical setting in cancer patients and was therefore the topic of the present investigation.

METHODS
Tumor blood flow (BF) was quantified in twenty breast cancer patients with [15O]-H2O positron emission tomography imaging at rest and during supine cycling in the scanner (individually chosen intensity by Borg scale, RPE 11-16). BF was also measured in non-cancerous, contralateral breast tissue.

RESULTS
Tumor BF was at rest 12.7±8.5 ml/(dl/min) and during exercise 8.7±8.1 ml/(dl/min), p=0.004. Thus, tumor BF was significantly reduced from rest to during exercise condition. BF in the contralateral healthy breast tissue was much lower and was not significantly changed from rest to exercise (2.0±1.9 ml/(dl/min at rest and 1.6±1.7 ml/(dl/min) during exercise, p=ns).

CONCLUSION
Tumor blood flow is reduced during exercise from the resting baseline in breast cancer patients. These results do not support the reasoning that at least breast cancer patients should exercise during their chemotherapy infusions. Whether the responses differ between different cancer patient groups/tumors remains to be investigated.

Keywords

exercise oncology, tumor, blood flow, breast cancer

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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