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ORIGINAL ARTICLE

Photobiomodulation for the management of radiation dermatitis: the DERMIS trial, a pilot study of MLS®laser therapy in breast cancer patients

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Abstract
Purpose The aim of this study was to assess the effectiveness and acceptability of photobiomodulation using MLS® laser therapy (LT) in the management of acute radiation dermatitis (RD).
Methods We compared two successive groups of breast cancer patients undergoing identical radiotherapy regimens post-lumpectomy. Both groups received our standard skin care but the second group received six additional LT sessions (beam area 19.635 cm^2, 0.168 W/cm^2, 4 J/cm^2), starting at fraction 20 of radiotherapy (control and LT group, $N=41$ and 38, respectively). The clinical outcomes were the severity of RD (using the Radiation Therapy Oncology Group [RTOG] criteria and the Radiotherapy-Induced Skin Reaction Assessment Scale [RISRAS]) and dermatology-specific quality of life (Skindex-16) before the start of LT and at the end of radiotherapy. Secondary outcomes were patients'ratings of skin care or LT (pleasantness, soothing effect, and global satisfaction).
Results Skin toxicity was equivalent between the groups before the start of LT but significantly differed at the end of radiotherapy, with an aggravation in the control but not in the LT group (e.g., 29 versus 3 % of RTOG grade 2 RD, respectively, $P<0.005$). We found no significant group differences with respect to quality of life. However, the RISRAS subjective score decreased in the LT group only, implying a decreased impact of RD on patients' quality of life. Finally, patients' ratings were significantly higher for LT than for standard care.
Conclusions These findings suggest that LT might be effective to manage acute RD and warrant further research.
Trial registration Clinical trial number: NCT01932073. https://clinicaltrials.gov/ct2/show/NCT01932073

Keywords Breast neoplasms· Low level laser·therapy Photobiomodulation · Radiation· Radiation oncology Radiotherapy-induced skin reactions

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