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Photobiomodulation therapy for the prevention of acute radiation dermatitis in breast cancer patients undergoing hypofractioned whole-breast irradiation (LABRA trial)

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Abstract

Objectives: To evaluate the efficacy of photobiomodulation therapy in breast cancer patients post-lumpectomy undergoing hypofractionated whole-breast irradiation (HF-WBI) for the prevention and management of acute radiodermatitis (ARD).

Materials and methods: A randomized, multicentric clinical trial (LABRA trial, NCT03924011) was set up at the Limburg Oncology Center, including the Jessa Hospital (Hasselt, BE) and Ziekenhuis Oost-Limburg (Genk, BE). A total of 71 breast cancer patients planned to undergo HF-WBI were randomized to one of the two study arms: the control group (n = 32) or the PBM group (n = 39). The PBM group received the standard institutional skincare combined with PBM (2×/week) during the complete radiotherapy (RT) course. Patients in the control group received the standard skincare combined with placebo treatment (2x/week). Patients' skin reactions were evaluated weekly during the RT treatment by using the modified version of the Radiation Therapy Oncology Group (RTOG) criteria.

Results: At week 3 of RT, one patient presented a grade 2 and one patient a grade 3 skin reaction in the control group, while in the PBM group, all patients still presented grade 1 ARD. At the final RT session 28% of the patients presenting grade 2-3 ARD, while in the PBM group 10% presented grade 2 and no grade 3 ARD. PBM reduced the incidence of severe ARD by 18%. However, the difference was not significant (p = 0.053).

Conclusion: Based on the LABRA trial results, PBM seems not able to reduce the incidence of severe ARD in breast cancer patients undergoing HF-WBI. Research in a larger patient population is recommended.

Keywords: acute radiodermatitis; breast cancer; dermatology; photobiomodulation therapy; radiotherapy; skin.

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