

CORRESPONDENCE

Open Access



# Letter to the Editor concerning the article “Application of red light phototherapy in the treatment of radioactive dermatitis in patients with head and neck cancer”

Jolien Robijns<sup>1\*</sup>, Sandrine Censabella<sup>2</sup>, Stefan Claes<sup>3</sup>, Luc Pannekoek<sup>3</sup>, Lore Bussé<sup>1</sup>, Dora Colson<sup>1</sup>, Iris Kaminski<sup>1</sup>, Victoria Broux<sup>1</sup>, Joy Lodewijckx<sup>1</sup>, Sofie Puts<sup>1</sup>, Paul Bulens<sup>2,3</sup>, Annelies Maes<sup>2,3</sup>, Leen Noé<sup>2,3</sup>, Marc Brosens<sup>2,3</sup>, An Timmermans<sup>4</sup>, Ivo Lambrechts<sup>1</sup>, Veerle Somers<sup>1</sup> and Jeroen Mebis<sup>1,2,3</sup>

## Abstract

The aim of this Letter to the Editor was to report some methodological shortcomings in the recently published article “Application of red light phototherapy in the treatment of radioactive dermatitis in patients with head and neck cancer” by Zhang et al. There are some issues regarding the incomplete photobiomodulation (PBM) parameters, the chosen outcome measures, and some missing reference articles. In conclusion, the results of this study should be interpreted with caution and further research is necessary.

**Keywords:** Photobiomodulation, Acute radiodermatitis, Head and neck cancer, Radiotherapy, Red light

Dear editor,

We read with great interest the article entitled “Application of red light phototherapy in the treatment of radioactive dermatitis in patients with head and neck cancer” authored by Zhang et al. [1]. The article was published in the *World Journal of Surgical Oncology* in November 2018.

The aim of this study was “to investigate the effect of red light phototherapy (RLPT) on radioactive dermatitis (RD) caused by radiotherapy in patients with head and neck cancer (HNC)” [1]. The authors of the study concluded that RLPT could accelerate wound healing and improve patients’ quality of life [1]. Although the results are interesting, some methodological issues should be considered.

Our research group, under supervision of Prof. Dr. Mebis Jeroen, has already built up some extensive scientific evidence that photobiomodulation therapy (PBMT) is an effective preventive and therapeutic method for acute RD in cancer patients [2–5]. In a recent,

randomized, placebo-controlled, clinical trial (RCT; TRANSDERMIS trial), we were able to demonstrate that PBMT can effectively reduce the severity of acute RD in breast cancer patients, both by subjective and objective outcome measures. Moreover, the quality of life of the patients undergoing PBMT was significantly better in comparison with the control group [3, 4]. Currently, we are still performing a RCT investigating the effect of PBMT in HNC patients undergoing radiotherapy (ClinicalTrials.gov Identifier: NCT02738268).

The use of PBMT in the management of acute RD is growing steadily. In order to improve the current manuscript by Zhang et al., we would like to make some suggestions.

1. The preferred name for RLPT is “photobiomodulation therapy (PBMT).” This was determined at the 2014 joint North American Association for Laser Therapy [6] and World Association for Laser Therapy (WALT) conference. PBM is defined as follows: “The therapeutic use of light [e.g., visible, near infrared (NIR), infrared (IR)] absorbed by endogenous chromophores, triggering non-thermal, non-cytotoxic, biological reactions

\* Correspondence: [jolien.robijns@uhasselt.be](mailto:jolien.robijns@uhasselt.be)

<sup>1</sup>Faculty of Medicine and Life Sciences, Hasselt University, Martelarenlaan 42, 3500 Hasselt, Belgium

Full list of author information is available at the end of the article



through photochemical or photophysical events, leading to physiological changes” [6].

- Irradiation and treatment parameters are crucial for a successful PBM treatment. The paper from Zhang et al. did not publish any of these important parameters. As such, it is difficult to know how to interpret the results reported in this manuscript. Therefore, we suggest the authors to include a complete list of PBM parameters as recommended by Jenkins et al. [7].
- In order to overcome the placebo effect, they should have included a sham treatment in the control group.
- Concerning the outcome measures, the authors did not mention on which time point they compared the degree of acute RD between the two study groups and if this evaluation was performed in a blinded manner.
- In their conclusion, they state that RLPT improved the patient’s quality of life. However, they did not evaluate the quality of life of the patients during the trial by using a specific questionnaire. As such, they cannot state that the patient’s quality of life improved due to RLPT, because they have no detailed data [8].
- Moreover, the authors did not refer to other clinical trials that investigated the use of PBMT in the management of acute RD previous to their study. We suggest that the authors should add these references to their paper [2–4, 9–12].

In conclusion, the study by Zhang et al. demonstrated some disadvantages in their study design and outcome assessment, which raised some questions concerning the value of their conclusion. However, as researchers in the field of PBMT and supportive cancer care, we greatly support all the clinical trials concerning the use of PBM.

#### Abbreviations

HNC: Head and neck cancer; IR: Infrared; NAALT: North American Association for Laser Therapy; NIR: Near infrared; PBM: Photobiomodulation therapy; RCT: Randomized, controlled trial; RD: Radioactive dermatitis/radiodermatitis; RLPT: Red light phototherapy; WALT: World Association for Laser Therapy

#### Acknowledgements

Not applicable

#### Funding

JR and JM received funding from the following organisations:

- Limburg Clinical Research Program supported by the foundation Limburg Sterk Merk, province of Limburg, Flemish government, Hasselt University, Ziekenhuis Oost-Limburg, and Jessa Hospital.
- ASA srl.
- Limburgs Kankerfonds
- Kom op Tegen Kanker

#### Availability of data and materials

Not applicable

#### Authors’ contributions

JR wrote the letter, with the input of S Ce, SCI, LP, LB, DC, IK, JL, VB, SP, PB, AM, LN, MB, AT, IV, VS, and JM. All authors read and approved the final manuscript.

#### Ethics approval and consent to participate

Not applicable

#### Consent for publication

Not applicable

#### Competing interests

The authors declare that they have no competing interests.

#### Publisher’s Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

#### Author details

<sup>1</sup>Faculty of Medicine and Life Sciences, Hasselt University, Martelarenlaan 42, 3500 Hasselt, Belgium. <sup>2</sup>Department of Medical Oncology, Jessa Hospital, Stadsomvaart 11, Hasselt, Belgium. <sup>3</sup>Limburg Oncology Centre, Jessa Hospital, Stadsomvaart 11, Hasselt, Belgium. <sup>4</sup>Department of Dermatology, Jessa Hospital, Stadsomvaart 11, Hasselt, Belgium.

Received: 29 November 2018 Accepted: 18 March 2019

Published online: 23 March 2019

#### References

- Zhang X, Li H, Li Q, Li Y, Li C, Zhu M, Zhao B, Li G. Application of red light phototherapy in the treatment of radioactive dermatitis in patients with head and neck cancer. *World J Surg Oncol*. 2018;**16**(1):222. <https://doi.org/10.1186/s12957-018-1522-3>.
- Censabella S, Claes S, Robijns J, Bulens P, Mebis J. Photobiomodulation for the management of radiation dermatitis: the DERMIS trial, a pilot study of MLS® laser therapy in breast cancer patients. *Support Care Cancer*. 2016;1–9. <https://doi.org/10.1007/s00520-016-3232-0>.
- Robijns J, Censabella S, Claes S, Pannekoek L, Busse L, Colson D, Kaminski I, Lodewijckx J, Bulens P, Maes A, Noe L, Brosens M, Timmermans A, Lambrichts I, Somers V, Mebis J. Biophysical skin measurements to evaluate the effectiveness of photobiomodulation therapy in the prevention of acute radiation dermatitis in breast cancer patients. *Support Care Cancer*. 2018. <https://doi.org/10.1007/s00520-018-4487-4>.
- Robijns J, Censabella S, Claes S, Pannekoek L, Busse L, Colson D, Kaminski I, Bulens P, Maes A, Noe L, Brosens M, Timmermans A, Lambrichts I, Somers V, Mebis J. Prevention of acute radiodermatitis by photobiomodulation: a randomized, placebo-controlled trial in breast cancer patients (TRANSDERMIS trial). *Lasers Surg Med*. 2018. <https://doi.org/10.1002/lsm.22804>.
- Robijns J, Censabella S, Bulens P, Maes A, Mebis J. The use of low-level light therapy in supportive care for patients with breast cancer: review of the literature. *Lasers Med Sci*. 2017;**32**(1):229–42. <https://doi.org/10.1007/s10103-016-2056-y>.
- WALT/NAALT, Photobiomodulation: mainstream medicine and beyond. WALT Biennial Congress and NAALT Annual Conference, Arlington Virginia USA (September 2014). 2014.
- Jenkins PA, Carroll JD. How to report low-level laser therapy (LLLT)/ photomedicine dose and beam parameters in clinical and laboratory studies. *Photomed Laser Surg*. 2011;**29**(12):785–7. <https://doi.org/10.1089/pho.2011.9895>.
- Chren MM. The Skindex instruments to measure the effects of skin disease on quality of life. *Dermatol Clin*. 2012;**30**(2):231–6, xiii. <https://doi.org/10.1016/j.det.2011.11.003>.
- Schindl M, Kerschank K, Schindl A, Schon H, Heinzl H, Schindl L. Induction of complete wound healing in recalcitrant ulcers by low-intensity laser irradiation depends on ulcer cause and size. *Photodermatol Photoimmunol Photomed*. 1999;**15**(1):18–21.
- Fife D, Rayhan DJ, Behnam S, Ortiz A, Elkeeb L, Aquino L, Eduardo Roa D, Ramsinghani N, Kuo J, Newcomb R, Zachary CB, Kelly KM. A randomized, controlled, double-blind study of light emitting diode photomodulation for the prevention of radiation dermatitis in patients with breast cancer.

Dermatol Surg. 2010;**36**(12):1921–7. <https://doi.org/10.1111/j.1524-4725.2010.01801.x>.

11. DeLand MM, Weiss RA, McDaniel DH, Geronemus RG. Treatment of radiation-induced dermatitis with light-emitting diode (LED) photomodulation. *Lasers Surg Med.* 2007;**39**(2):164–8. <https://doi.org/10.1002/lsm.20455>.
12. Strouthos I, Chatzikonstantinou G, Tselis N, Bon D, Karagiannis E, Zoga E, Ferentinos K, Maximenko J, Nikolettou-Fischer V, Zamboglou N. Photobiomodulation therapy for the management of radiation-induced dermatitis : A single-institution experience of adjuvant radiotherapy in breast cancer patients after breast conserving surgery. *Strahlenther Onkol.* 2017;**193**(6):491–8. <https://doi.org/10.1007/s00066-017-1117-x>.

**Ready to submit your research? Choose BMC and benefit from:**

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

**At BMC, research is always in progress.**

Learn more [biomedcentral.com/submissions](https://biomedcentral.com/submissions)

