Modifying the Microbiome as a Potential Mechanism of Photobiomodulation: A Case Report

Abstract

Objective:

The objective of this case study was to elucidate the effect of photobiomodulation (PBM) on the microbiome.

Background:

The gut microbiome has been identified as a key component of health, with gut dysbiosis, characterized by decreased microbial diversity and an altered microbial composition, being recognized as instrumental in many diseases and disorders. Previous research has suggested that the gut microbiome can be favorably altered in animal models using PBM.

Materials and methods:

The participant had their microbiome tested on nine occasions, three times before any treatment, three times after radiotherapy and commencement of immunotherapy for breast cancer, and three times after PBM treatment. The PBM treatment consisted of infrared laser treatment (904 nm; 700 Hz pulse frequency, 861.3 total joules) to the abdomen three times per week for 11 weeks.

Results:

The microbiome of the participant showed significant changes in diversity after PBM treatment, but not after cancer therapy, with an increase in the number of known beneficial bacteria (*Akkermansia*, *Faecalibacterium*, and *Roseburia*) and decrease in the number of potentially pathogenic genera.

Conclusions:

The results suggested the possibility that PBM may alter the microbiome and thus it represents a therapeutic avenue for chronic diseases with otherwise limited treatment options.