

Photobiomodulation therapy in subjective tinnitus: A systematic review

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Abstract

Tinnitus is a phantom perception of sound without an external source. It has high prevalence and in severe cases can impair quality of life. Photobiomodulation therapy (PBMT) uses light to repair cell damage and modulate the function of target tissue. This article systematically reviews studies that have used PBMT in the treatment of tinnitus to determine the level of evidence for its effectiveness. Studies published by May 2020, are reviewed according to PRIZMA guidelines. 8417 articles found in the original search of PubMed, Google scholar, Embase and Cochrane databases. 35 articles met our inclusion criteria. Because the results of the studies are not homogeneous, it is impossible to determine the exact level of evidence for PBMT effectiveness. However, 7 out of 13 RCTs and the animal study of PBMT in tinnitus, as well as animal studies of brain disorders that share a pathway with tinnitus, have confirmed its effectiveness. Based on this evidence, PBMT is likely to be effective in treating tinnitus. The mechanism of tinnitus and the mechanism of PBMT modulatory effects as well as the gaps and potential limitations of the studies are also discussed. Factors that may improve outcomes in future studies include: transcranial PBMT to modulate central compensatory changes, the use of objective assessment methods, and the selection of laser parameters based on evidence from animal studies of brain disorders associated with tinnitus.

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