25TH NATIONAL & 11TH INTERNATIONAL ANNUAL CONGRESS
ON RESEARCH AND TECHNOLOGY OF IRANIAN MEDICAL SCIENCES STUDENTS
URMIA UNIVERSITY OF MEDICAL SCIENCES, URMIA, IRAN

Melatonin Potential in Alleviating Radiation-Induced Dermatitis in Breast Cancer Patients

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Citation:
Ghanbari M, Mirshahi A, Kamel Moghaddam N, Ghahari S A, Nabavi S E, Daneshvar A, Zavvar M. Melatonin Potential in Alleviating Radiation-Induced Dermatitis in Breast Cancer Patients. *Iranian biomedical journal*. Supplementary (12-2024): 206.

ABSTRACT

Introduction: Breast cancer (BC) treatment often involves radiation therapy, which can lead to radiation dermatitis, a common and troublesome side effect characterized by skin inflammation and discomfort. Despite various approaches to managing radiation dermatitis, including topical treatments and supportive care, effective interventions remain limited. Melatonin, a natural hormone with antioxidant and anti-inflammatory properties, has shown promise in preclinical studies for treating radiation-induced skin toxicity. However, the clinical efficacy of melatonin in BC patients with radiation dermatitis needs to be well-established. This systematic review evaluates clinical trial evidence to determine the impact of melatonin on the severity and duration of radiation dermatitis in BC patients undergoing radiation therapy.

Search Strategy: This study adhered to Cochrane systematic review principles and followed PRISMA guidelines. A thorough search was conducted using the keywords "melatonin", "breast cancer", "dermatitis", and "radiotherapy" in scholarly databases, including PubMed, Scopus, and Web of Science, without time limitation. In addition, grey literature was explored using the Google Scholar search engine. Inclusion criteria encompassed randomized controlled trials (RCTs) focusing on radiation therapy for patients with BC and the use of melatonin in these patients. Exclusion criteria included duplicate publications, reviews, observational and quasi-experimental studies, book chapters, opinion pieces, letters to the editor, preclinical studies, and articles lacking primary data or clear method descriptions. Screening and data extraction were independently performed by two authors, with discrepancies resolved through consensus involving a third author. The RoB 2 critical appraisal tool was employed to assess the quality of studies, and data from selected studies were meticulously organized into an extraction table.

Results: In total, 17 articles containing five duplicates and eight irrelevant titles and abstracts were identified. After a full-text assessment of four articles, three RCTs were included in the study. While two RCTs showed no significant difference between the melatonin intervention and control groups, one trial revealed a notable reduction in dermatitis symptoms among patients who received melatonin supplementation.

Conclusion and Discussion: Studies examining the impact of melatonin on dermatitis in BC patients present mixed findings. Further research with larger sample sizes and rigorous methodology is necessary for conclusive results. Given affordability and minimal adverse effects of melatonin, its potential efficacy in reducing radiation-induced dermatitis would be highly beneficial.

Keywords: Breast neoplasms, Melatonin, Dermatitis, Radiotherapy

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[DOI: 10.61186/ibj.25th-11th-IACRTIMSS]