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Impact of Melatonin on Dysmenorrhea: A Systematic Review and Meta-Analysis

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ABSTRACT

Introduction: Dysmenorrhea, commonly known as menstrual pain, affects many women, reducing their quality of life and daily functioning. While often effective, traditional treatment options can suffer from undesirable side effects or limited efficacy. In recent years, melatonin, a hormone primarily known for regulating sleep-wake cycles, has garnered attention for its potential analgesic and anti-inflammatory properties. This systematic review and meta-analysis aimed to explore the effects of melatonin consumption on menstrual pain.

Search Strategy: We conducted a systematic review and meta-analysis based on Cochrane systematic review principles and PRISMA guidelines. Databases searched included PubMed, Scopus, Web of Science, and Google Scholar, covering literature using keywords including “Melatonin”, “Menstrual pain”, and “Dysmenorrhea”. Inclusion criteria were established to include before-and-after studies and randomized controlled trials involving women of reproductive age experiencing menstrual pain, with melatonin as the intervention compared to placebo or other pain management treatments. All review and animal studies, letters to the editor, and conference papers were excluded. Two authors independently screened and extracted the data; a third author resolved any discrepancies. The quality of the included studies was assessed using the ROB 2 scale. The heterogeneity of the studies was checked using the I^2 statistics. Using the random-effects model, we meta-analyzed the data and reported the standardized mean difference (SMD) with 95% confidence intervals (CI). Meta-analysis was carried out using the RevMan software.

Results: A total of 76 articles were initially identified; 34 were removed due to duplication and 38 due to lack of relevance. Finally, four studies with 150 participants were included in the study and analyzed using a random-effects model meta-analysis. All four studies found that melatonin significantly (1) decreased pain intensity, (2) decreased sleep disturbances, (3) increased estrogen and progesterone levels, and 4) improved attack days and headache severity. We observed a positive effect for melatonin in women with menstrual pain (SMD = -3.21; 95% CI: -5.12, -1.30; I^2 93.3%; p = 0.00).

Conclusion and Discussion: Melatonin shows promise as a valuable addition to menstrual pain management strategies, potentially improving the quality of life for many women. Healthcare providers may consider its use, and ongoing research should continue to refine its application.

Keywords: Dysmenorrhea, Melatonin, Meta-analysis, Systematic review

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