

## RESEARCH ARTICLE

# Effects of Melatonin on Some Bone Mineralization Biomarkers for Overweight or Obese Perimenopause Women; A Possible Role in Osteoporosis Treatment

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## ABSTRACT

**Background:** Melatonin has shown to play an important role in many physiological functions, but its effects on bone metabolism were not well defined in humans.

**Objective:** Evaluation of the effects of oral melatonin used for two months on bone mineralization biomarkers for women in perimenopause.

**Methods:** Interventional double-blind placebo-control study, in which 60 women in perimenopause (age range 46–48) assigned in either control (n = 30) or study (n = 30) group. The last group received 3 mg tablet of melatonin once a day at night for two months. Parameters measured were serum osteocalcin, 25(OH) vitamin D, calcium, and C-terminal telopeptide of type 1 collagen (CTX-1).

**Result:** Melatonin led to significant rise ( $p < 0.05$ ) in osteocalcin, serum vitamin D, serum calcium, and CTX-1 as compared with control values.

**Conclusion:** Melatonin showed positive effects on bone health by a significant increase in some bone mineralization biomarkers.

**Keywords:** C-terminal telopeptide of type 1 collagen (CTX-1), Melatonin, Osteocalcin, Perimenopause women.

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## INTRODUCTION

Osteoporosis and insomnia are the major problems among women in perimenopause, especially due to decrease the level of estrogen and melatonin.<sup>1,2</sup> A decline in the levels of these hormones in perimenopause and postmenopausal women can significantly causing vasomotor symptoms (e.g., hot flashes, vaginal dryness, sexual dysfunction, mood disturbances, anxiety, and restlessness) in addition to fatigue and poor concentration.<sup>3</sup> These symptoms gradually disappear in most women during menopausal transition but, in other women, comorbidities develop associated with greatest reduction in melatonin level and persistent bone loss.<sup>4</sup> These fluctuations of hormones during premenopausal

period leading to change in the level of bone turnover markers (osteocalcin, OC for bone formation, and CTX-1 for bone resorption) in serum.<sup>5</sup> The vasomotor symptoms negatively affect daily functioning and habits leading many women to seek for pharmaceutical options, such as, hormone therapy or non-pharmaceutical options, like vitamins to normalize sleep pattern,<sup>6</sup> many over the counter options, nutritional supplements, like melatonin, etc., are available to improve the physical symptoms and bone health of women in peri and menopause.<sup>7</sup>

Melatonin is an endogenous hormone synthesized from serotonin in the pineal gland in response to darkness, with level beginning to rise reaching peak at about 2:00 am.<sup>8</sup> Light

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