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Miracle coordination between sleep patterns and osteoporosis

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ABSTRACT

Core tip: One of negative effects of sleep deprivation is osteoporosis, an abnormality characterized by a reduction in bone mineral density. Hence regular circadian rhythm can be considered as a major preventive factors of osteoporosis.

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A disorder described by reduced bone mass and raised fragility is osteoporosis, which increases the risk for fractures. Also it is one of the most common diseases among adults and old people, being associated with some risk factors such as age and menopause, a family history of alcohol consumption, fracture and estrogen deficiency (1). Accumulated evidences suggest that sleep pattern disruption may lead to alterations in physiology, potentially triggering the development of osteoporosis (2).

With increasing stress during life, because of work, financial and other issues a large number of people experienced troubles in sleeping. There is little certain information available about chronic sleep loss that affect our health while it may impact bone formation or loss. Scientists in Wisconsin College have investigated malfunctions in bone marrow in rats due to chronic sleep deprivation. They found abnormalities in serum markers of bone metabolism in these rats, which led to conduct direct measurements of bone parameters (3). Sleep deprivation has been found to be harmful in metabolic and endocrine system, definitely increasing the risk for disorders such as metabolic syndrome, obesity, and diabetes. In a survey conducted by society for experimental biology and medicine indicated that sleep deprivation prevents bone creation, reduces fat within the red marrow and also raise platelet quantity in rats (3).

In one hand person who works on the night shift three days in one month approximately, has insomnia or stay up for more than 24 hours at a time, sleep 7 hours each day even less is at high risk for developing osteoporosis (4) and on the other hand some studies have showed that older people who sleep more are more and do not have any static or dynamic mechanical stresses experience more falls and fractures and have low total hip and femur neck bone mineral density. Another study found that in-

dividuals who slept 6 or less hours or more than 9 hours were more likely to have osteoporosis (4).

One study found that woman with lacking sleep had obviously lower total and local bone mineral density than those who slept eight hours. A cross-sectional analysis proposed that sleep deprivation is associated with lower cortical volumetric bone mineral density in women. Further research is necessary to explain the coordination between self-reported sleep duration and osteoporosis in older adults (5). Long sleep duration (≥ 9 hours) and early sleep timing were independently and interactively associated with an increased risk of osteoporosis in this older Chinese population (2).

Sleep as a physiologic behavior can have direct positive and negative effect on osteoporosis development as a silent disease categorized by low bone mineral density. These days scientist found that sleep pattern and duration can affect osteoporosis development so abnormal circadian rhythms are associated with lots of chronic disease such as osteoporosis.

Author's contribution

SK solely contributed to this paper.

Conflicts of interest

The author declared no competing interests.

Ethical considerations

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