About air pollution and hip fracture

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Raised levels of air pollution have recently been linked to the induction of inflammatory phenomena at both systemic and tissue levels. Chronic inflammatory diseases, such as rheumatoid arthritis or chronic obstructive pulmonary disease, reduce bone mineral density (BMD), which leads to an increase in the release of immune cells from the bone marrow. Particulate matter is associated with oxidative damage and inflammation, which can accelerate bone loss and increase the risk of fractures in older adults. However, the association between air pollution and osteoporosis is not yet well defined in the literature.

It seems that there are other indirect routes, such as vitamin D and PTH, which may also be altered by contamination and are involved in bone remodeling1-8. In the first place, air pollution (microparticles and ozone) presents a physical barrier to ultraviolet B solar radiation, thus contributing to a lower cutaneous production of vitamin D2,4,5. Similarly, a study conducted in the United States9 indicated the relationship between low levels of PTH in blood and elevated levels of microparticles and carbon in the air, causing indirect harmful effects on bone mass.

To appreciate the importance of these findings, we should take into account the complex etiology of osteoporosis and its consequence of fragility fractures in the general population. Osteoporosis is a systemic disease. Approximately one third of women and one tenth of men over 50 have osteoporosis or osteopenia. The statistics allow us to calculate that approximately one in two women and one in three men over 50 will suffer a fragility fracture during their lifetime.

These patients are more apt to suffer a second fracture, in addition to developing chronic pain, greater dependence on basic activities of daily living and a reduction in their quality of life.

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Bibliography


