OPEN ACCESS Freely available online

Journal of Osteoporosis and Physical Activity

Opinion Article

Long-Term Effects of Endocrine Chemicals on Male Teen Bone Health

Eibrink Atteveld*

Department of Paediatrics, Amsterdam University Medical Center, Amsterdam, The Netherlands

DESCRIPTION

Endocrine Disrupting chemicals (EDCs) are substances that interfere with the body's hormonal system, often mimicking or blocking natural hormones. Found in everyday products such as plastics, pesticides, personal care items, and even food packaging, EDCs pose various health risks. One emerging concern is their impact on bone health, particularly in male teens. During adolescence, rapid bone growth and density development occur, making this stage essential for lifelong skeletal health. This article explores how EDCs affect bone health in male teens and strategies to minimize exposure. Adolescence is a period of significant growth and hormonal changes, driven largely by sex hormones like testosterone. For boys, this phase involves, rapid bone growth with lengthen and thicken during puberty. Most bone density is achieved by the late teenage years, which sets the foundation for adult skeletal health. Optimal bone development depends on factors like genetics, nutrition, physical activity, and a balanced hormonal environment. Any disruption in these processes, such as through exposure to EDCs, can have lasting consequences. EDCs can disrupt the hormonal balance essential for bone growth by mimicking or inhibiting the activity of testosterone and other hormones important for skeletal development. This interference may result in reduced bone mineral density, delayed growth, and weaker bones, increasing the risk of fractures and osteoporosis later in life.

Effect of endocrine disrupting chemicals for bone health

Testosterone plays a pivotal role in bone formation for males. EDCs, such as Bisphenol A (BPA) and phthalates, mimic or block testosterone, leading to impaired bone growth. This can result in lower bone density and strength. Certain EDCs interfere with calcium absorption and utilization, which are essential for bone mineralization. Without adequate calcium incorporation, bones become weaker and more prone to fractures. Growth hormone and Insulin-like Growth Factor 1 (IGF-1) are essential for adolescent development. EDCs can suppress the production or action of these hormones, further disrupting bone growth during important years. Exposure to EDCs increases oxidative stress and inflammation in the body. Both processes can damage bone-forming cells (osteoblasts) and exacerbate bone loss. EDCs are pervasive in modern environments. Common sources include, BPA and phthalates are used in the production of plastic containers, bottles, and toys. Chemicals like DDT and atrazine persist in soil and food chains. Parabens and synthetic fragrances in shampoos, lotions, and deodorants. Additives and packaging materials leach chemicals into food. Flame retardants in furniture and electronics. Male teens are particularly vulnerable due to their frequent contact with these products and their developing bodies' heightened sensitivity to hormonal disruptions. To mitigate the impact of EDCs on bone health, male teens should adopt strategies to reduce exposure. Opting for BPA-free and phthalate-free products, avoiding microwaving food in plastic containers, and choosing fresh, organic produce over processed foods can help minimize ingestion of these chemicals. Using natural or fragrance-free personal care products and ventilating living spaces to reduce exposure to flame retardants are also effective measures.

Long term consequences of EDC exposure

For male teens, compromised bone development can have far-reaching effects, such as, lower bone density increases the risk of osteoporosis later in life. Weaker bones are more susceptible to fractures during adolescence and adulthood. Impaired bone health may contribute to musculoskeletal disorders and reduced mobility. Compromised bone development in male teens can also impact peak bone mass, which is typically achieved by early adulthood and serves as an important determinant of lifelong bone health. Suboptimal bone strength during adolescence can hinder physical performance, limiting participation in sports and other activities. This may also negatively affect posture and overall skeletal alignment, potentially leading to chronic pain or deformities. Furthermore, poor bone health during this important growth phase can impair overall growth potential, reducing height and stature. Nutritional deficiencies, particularly

Correspondence to: Eibrink Atteveld, Department of Paediatrics, Amsterdam University Medical Center, Amsterdam, The Netherlands, Email: atteveibri90@yahoo.com

Received: 25-Nov-2024, Manuscript No. JOPA-24-35722; **Editor assigned:** 27-Nov-2024, PreQC No. JOPA-24-35722 (PQ); **Reviewed:** 11-Dec-2024, QC No. JOPA-24-35722; **Revised:** 18-Dec-2024, Manuscript No. JOPA-24-35722 (R); **Published:** 24-Dec-2024, DOI: 10.35248/2329-9509.24.12.430

Citation: Atteveld E (2024). Long-Term Effects of Endocrine Chemicals on Male Teen Bone Health. J Osteopor Phys Act. 12:430.

in calcium and vitamin D, and lack of weight-bearing exercises can exacerbate these risks, creating a cascade of health issues. Prolonged bone weaknesses can increase healthcare costs and reduce quality of life. Addressing these concerns early is essential to promote long-term musculoskeletal resilience and overall well-being.

CONCLUSION

Endocrine-disrupting chemicals present a significant but often overlooked threat to bone health in male teens. By interfering with hormonal balance, calcium metabolism, and bone growth, these chemicals can compromise the foundation of a strong skeleton, leading to long-term health issues. However, proactive steps-such as reducing exposure to EDCs, prioritizing bone-friendly nutrition, and engaging in regular exercise can mitigate these risks.