

Preventing Childhood Bone Fractures by Avoiding Alcohol during Pregnancy

Juha Serlo*

Department of Pediatric Surgery and Orthopaedics, University of Oulu, Oulu, Finland

DESCRIPTION

Maternal health and lifestyle choices during pregnancy have profound outcome on the developing fetus, influencing a range of health outcomes in early childhood and beyond. Among these lifestyle choices, alcohol consumption during pregnancy remains a significant public health concern [1]. Recent research indicates that maternal alcohol consumption is associated with an increased risk of bone fractures in early childhood, shedding light on another important aspect of fetal development affected by prenatal exposure to alcohol [2]. Alcohol consumption during pregnancy can lead to a spectrum of adverse outcomes collectively known as Fetal Alcohol Spectrum Disorders (FASD). These include a range of physical, behavioural, and cognitive abnormalities. Alcohol readily crosses the placental barrier, directly affecting the developing fetus, which lacks the enzymatic machinery to metabolize alcohol efficiently [3]. This exposure can disrupt normal cellular processes, leading to developmental defects.

Alcohol and bone development in the fetus

Alcohol consumption during pregnancy can interfere with fetal bone development in several ways. It can affect the supply of essential nutrients, such as calcium and vitamin D, which are important for bone formation [4]. Moreover, alcohol can disrupt hormonal balances, particularly those involving growth factors and hormones that regulate bone growth and metabolism. These disruptions can lead to weaker bones that are more susceptible to fractures in early childhood [5]. Fetal bone development is a complex process that begins early in pregnancy and continues into childhood. This process, known as ossification, involves the transformation of cartilage into bone, which is important for the structural integrity and strength of the skeleton [6]. Several factors, including genetic, nutritional, and environmental influences, play vital roles in this development.

Evidence linking maternal alcohol consumption to childhood bone fractures

Several studies have investigated the relationship between maternal alcohol consumption and the risk of bone fractures in

children. Research findings consistently demonstrate that children exposed to alcohol in utero have a higher incidence of bone fractures compared to those who were not exposed [7]. These studies highlight the long-term effects of prenatal alcohol exposure on skeletal health. One significant study published in a leading medical journal analysed data from thousands of mother-child pairs. The researchers found that children whose mothers consumed alcohol during pregnancy had a significantly higher risk of bone fractures before the age of six [8]. The study controlled for various confounding factors, including maternal smoking, socioeconomic status, and overall health, strengthening the link between prenatal alcohol exposure and early childhood fractures.

The exact mechanisms through which maternal alcohol consumption leads to an increased risk of bone fractures in children are still being elucidated [9]. However, several hypotheses have been proposed. Alcohol can impair the placental transfer of essential nutrients required for bone development, such as calcium and vitamin D. Alcohol can alter the levels of hormones like Insulin-Growth Factor (IGF) and Parathyroid Hormone (PTH), which are important for bone growth and metabolism. Alcohol and its metabolites may exert direct toxic effects on the developing bone cells, impairing their proliferation and differentiation. Prenatal alcohol exposure can induce epigenetic modifications that alter gene expression patterns involved in bone development and maintenance [10]. The association between maternal alcohol consumption during pregnancy and an increased risk of bone fractures in early childhood underscores the importance of public health interventions. Pregnant women should be educated about the risks associated with alcohol consumption and encouraged to abstain from alcohol to ensure optimal fetal development. Healthcare providers play an important role in counseling and supporting pregnant women to make healthy lifestyle choices.

CONCLUSION

Maternal alcohol consumption during pregnancy is associated with an increased risk of bone fractures in early childhood, highlighting another significant consequence of prenatal alcohol

Correspondence to: Juha Serlo, Department of Pediatric Surgery and Orthopaedics, University of Oulu, Oulu, Finland, E-mail: juhse18@gmail.com

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exposure. Ensuring that pregnant women receive appropriate education and support to avoid alcohol can help protect the skeletal health of their children and prevent potential fractures and related complications. Further research is needed to fully understand the underlying mechanisms and to develop targeted interventions to mitigate these risks.

REFERENCES

1. Parviainen R, Auvinen J, Serlo W, Järvelin MR, Sinikumpu JJ. Maternal alcohol consumption during pregnancy associates with bone fractures in early childhood. A birth-cohort study of 6718 participants. *Bone*. 2020;137:115462.
2. Baker R, Orton E, Tata LJ, Kendrick D. Risk factors for long-bone fractures in children up to 5 years of age: A nested case-control study. *Arch Dis Child*. 2015;100(5):432-437.
3. Cooper C, Eriksson JG, Forsen T, Osmond C, Tuomilehto J, Barker DJ. Maternal height, childhood growth and risk of hip fracture in later life: A longitudinal study. *Osteoporos Int*. 2001;12:623-629.
4. Micklesfield LK, Levitt NS, Carstens MT, Dhansay MA, Norris SA, Lambert EV. Early life and current determinants of bone in South African children of mixed ancestral origin. *Ann Hum Biol*. 2007;34(6):647-655.
5. Young SL, Gallo LA, Brookes DS, Hayes N, Maloney M, Liddle K, et al. Altered bone and body composition in children and adolescents with confirmed prenatal alcohol exposure. *Bone*. 2022;164:116510.
6. Karlsson MK, Ahlborg HG, Karlsson C. Maternity and bone mineral density. *Acta Orthop*. 2005;76(1):02-13.
7. Cooper C, Harvey N, Javaid K, Hanson M, Dennison E. Growth and bone development. The window of opportunity: Pre-pregnancy to 24 months of age. 2008;61:53-68.
8. Breton-Larrivée M, Elder E, Legault LM, Langford-Avelar A, MacFarlane AJ, McGraw S. Mitigating the detrimental developmental impact of early fetal alcohol exposure using a maternal methyl donor-enriched diet. *FASEB J*. 2023;37(4):22829.
9. Popova S, Lange S, Probst C, Gmel G, Rehm J. Estimation of national, regional, and global prevalence of alcohol use during pregnancy and fetal alcohol syndrome: A systematic review and meta-analysis. *Lancet Glob Health*. 2017;5(3):290-299.
10. Huopio J, Kröger H, Honkanen R, Saarikoski S, Alhava E. Risk factors for perimenopausal fractures: A prospective study. *Osteoporosis International*. 2000;11:219-227.