



Health Inequalities: Osteoporosis

Introduction

Osteoporosis is a result of reduced bone mass and disruption of the micro-architecture of bone which leads to decreased bone strength and increased risk of fracture¹.

Prevalence and risk factors

Studies from other countries indicate that people with learning disabilities may have an increased prevalence of osteoporosis and lower bone density than the general population^{2 3 4 5 6}.

One UK study found a greater prevalence of some risk factors for osteoporosis among people with learning disability than other people⁷. These included the use of antiepileptics (AEDs) (64%), immobility (23%), history of falls (20%) and fractures (11%).

In Ireland, the prevalence of a doctor's diagnosis of osteoporosis for 753 people with learning disabilities aged 40 years and over was 8.1% but this is likely to be an underestimate in view of the insidious nature of the condition⁸. Indeed, a large-scale population-based study in Greater Glasgow incorporating health assessments found an osteoporosis prevalence of 18.5% among 1,023 people with learning disabilities⁹.

Osteoporosis was more common in women (OR 2.34, 95% CI 1.64, 3.32), in older age groups (for example 65+ OR 2.85, 95% CI 1.30, 6.27) and those with more severe learning disabilities (moderate learning disabilities OR 1.68, 95% CI 1.01, 2.82; severe OR 2.67, 95% CI 1.61, 4.44; profound OR 9.66, 95% CI 6.01, 15.54 (reference category mild learning disabilities)).

Osteoporosis was less common in people with Down syndrome (5.9% of 186 participants) than in people with learning disabilities without Down syndrome (21.3% of 837 participants) (OR 0.22, 95% CI 0.11, 0.43). However, adults with Down syndrome have lower bone mineral density (BMD) compared to the general population and experience a steeper decline with age¹⁰.

Impact on people with learning disabilities

People with learning disabilities are at higher risk of developing osteoporosis⁷. Contributory factors include lack of weight-bearing exercise, delayed puberty, earlier-than-average age at menopause for women, poor nutrition, being underweight and use of AEDs (which has been associated with bone disease¹¹).

Adults with learning disabilities are more sedentary than adults without intellectual disabilities¹² and have extremely low levels of physical activity¹³.

Low levels of vitamin D can lead to osteomalacia and osteoporosis in adults and high levels of vitamin D deficiency have been found among people with learning disabilities in the UK¹⁴. Almost twice as many community-living people with learning disabilities had vitamin D deficiency compared with controls (77.3% v. 39.6%)¹⁵. A study in the United States (US) found that for people with learning disabilities the rate of low-trauma fractures was approximately 3 times greater than in adults without learning disabilities¹⁶. Fractures can lead to devastating consequences for quality of life, independence and physical and psychological wellbeing⁸. Communication challenges among adults with learning disabilities can make it difficult for people to express their discomfort or pain, which can contribute to osteoporotic fracture going undiagnosed⁸.

Healthcare and treatment

There are no known guidelines or research studies relating to the management and treatment of osteoporosis in people with learning disabilities in the UK. One study in a large institution in Northern Ireland aimed to increase awareness among staff of the need for dietary vitamin D, regular exercise and sunshine exposure at safe levels and then apply these factors to patient care on a day to day basis¹⁷ but there is no information on outcomes for patients. Studies from other countries have reported that high rates of low-trauma fractures¹⁶ and femoral fractures¹⁸ begin at an earlier age in people with learning disabilities, and people with Down syndrome have a steeper decline in BMD with age¹⁰. As such, adults with learning disabilities should be considered for BMD testing earlier in life. However, bone health is often omitted in health checks⁷.

Communication and comprehension difficulties can lead to challenges for the person with learning disabilities understanding health screening procedures such as dual-energy X-ray absorptiometry (DXA)⁸. However, recent research in Scotland indicates that people across all levels of learning disabilities can complete DXA screening of their femur and lumbar regions once reasonable adjustments have been identified and implemented¹⁹. People with learning disabilities are at higher risk of developing osteoporosis⁷. Contributory factors include lack of weight-bearing exercise, delayed

Health inequalities: Osteoporosis

puberty, earlier-than-average age at menopause for women, poor nutrition, being underweight and use of AEDs (which has been associated with bone disease¹¹).

Adults with learning disabilities are more sedentary than adults without intellectual disabilities¹² and have extremely low levels of physical activity¹³.

Low levels of vitamin D can lead to osteomalacia and osteoporosis in adults and high levels of vitamin D deficiency have been found among people with learning disabilities in the UK¹⁴. Almost twice as many community-living people with learning disabilities had vitamin D deficiency compared with controls (77.3% v. 39.6%)¹⁵. A study in the United States (US) found that for people with learning disabilities the rate of low-trauma fractures was approximately 3 times greater than in adults without learning disabilities¹⁶. Fractures can lead to devastating consequences for quality of life, independence and physical and psychological wellbeing⁸. Communication challenges among adults with learning disabilities can make it difficult for people to express their discomfort or pain, which can contribute to osteoporotic fracture going undiagnosed⁸.

Social determinants

Poor bone health may be compounded by social determinants of health including poor dietary habits and lack of opportunity to engage in physical activity. Within community settings, social care staff may lack of awareness regarding how to support good bone health. However, there is no known research studies that have explicitly addressed social determinants of bone health for people with learning disabilities.

Resources

Happy Bones is an educational resource for people with learning disabilities developed to give an understanding of the importance of good bone health

National Osteoporosis Guideline Group (2017) **NOGG 2017: Clinical guideline for the prevention and treatment of osteoporosis**

References

- ¹ Poole KES and Compston JE. Osteoporosis and its management. *BMJ*, 2006. 333(7581): p. 1251-1256
- ² Center J, Beange H and McElduff A. People with mental retardation have an increased prevalence of osteoporosis: A population study. *American Journal on Mental Retardation*, 1998. 103: p. 19-28
- ³ Tyler CVJ, Snyder CW and Zyzanski S. Screening for osteoporosis in community-dwelling adults with mental retardation. *Mental Retardation*, 2000. 38: p. 316-321
- ⁴ Jaffe JS, Timell AM and Gulanski BI. Prevalence of low bone density in women with developmental disabilities. *Journal of Clinical Densitometry*, 2001. 4: p. 25-29
- ⁵ Jaffe JS and others. Risk factors for low bone mineral density in individuals residing in a facility for the people with intellectual disability. *Journal of Intellectual Disability Research*, 2005. 49(6): p. 457-462
- ⁶ Mergler S and others. Epidemiology of low bone mineral density and fractures in children with severe cerebral palsy: a systematic review. *Developmental Medicine & Child Neurology*, 2009. 51: p. 773-8
- ⁷ Srikanth R and others. Osteoporosis in people with intellectual disabilities: A review and a brief study of risk factors for osteoporosis in a community sample of people with intellectual disabilities. *Journal of Intellectual Disability Research*, 2011. 55(1): p. 53-62
- ⁸ Burke EA and others. An exploration of the bone health of older adults with an intellectual disability in Ireland. *Journal of Intellectual Disability Research*, 2017. 61(2): p. 99-114
- ⁹ Kinnear D and others. Prevalence of physical conditions and multimorbidity in a cohort of adults with intellectual disabilities with and without Down syndrome: cross-sectional study. *BMJ Open*, 2018. 8(2)
- ¹⁰ Carfi A and others. Bone mineral density in adults with Down syndrome. *Osteoporosis International*, 2017. 28(10): p. 2929-2934
- ¹¹ Petty SJ, Wilding H and Wark JD. Osteoporosis Associated with Epilepsy and the Use of Anti-Epileptics-a Review. *Current Osteoporosis Reports*, 2016. 14(2): p. 54-65
- ¹² Melville CA and others. Definitions, measurement and prevalence of sedentary behaviour in adults with intellectual disabilities - A systematic review. *Preventive Medicine*, 2017. 97: p. 62-71
- ¹³ Dairo YM and others. Physical activity levels in adults with intellectual disabilities: A systematic review. *Preventive Medicine Reports*, 2016. 4: p. 209-219
- ¹⁴ Chester V and others. Vitamin D deficiency in an inpatient forensic intellectual disability service. *Journal of Intellectual Disabilities*, 2017. 21(2): p. 134-143
- ¹⁵ Frighi V and others. Vitamin D deficiency in patients with intellectual disabilities: prevalence, risk factors and management strategies. *Br J Psychiatry*, 2014. 205(6): p. 458-64

¹⁶ Balogh R and others. Low-trauma fractures and bone mineral density testing in adults with and without intellectual and developmental disabilities: a population study. *Osteoporosis International*, 2017. 28(2): p. 727-732

¹⁷ Tohill C. and Lavery A. Sunshine, diet and mobility for healthy bones: an intervention study designed to implement these standards into the daily routine in an at-risk population of adults with intellectual disability. *Journal of Intellectual & Developmental Disability*, 2001. 26(3): p. 217-231

¹⁸ Büchele G and others. Fracture risk in people with developmental disabilities: results of a large claims data analysis. *Osteoporosis International*, 2017. 28(1): p. 369-375

¹⁹ Finlayson J and others. Reasonable adjustments to provide equitable and inclusive assessment, screening and treatment of osteoporosis for adults with intellectual disabilities: A feasibility study. *Journal of Applied Research in Intellectual Disabilities*, 2018. Online ahead of print