

Anti-epileptic drugs increase the risk of bone fractures in children

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Credit: Murdoch Children's Research Institute

New research has shown evidence that anti-epileptic drugs (AEDs) reduce bone density in children and therefore lead to an increase in the number of fractures, if used for more than a year.

The study by the Murdoch Children's Research Institute (MCRI), in conjunction with the Royal Melbourne Hospital (RMH), has prompted experts to highlight the importance of considering side effects when prescribing these drugs.

One in 150 children are diagnosed with epilepsy in the first decade of

life in Australia however there is currently very little paediatric data relating to the impact of AEDs on the health of the bones.

Researchers, including Professor John Wark from The RMH who has led many adult studies in this area, undertook a case controlled study using 23 pairs of twins, non-twin siblings and first cousins – one with epilepsy and one without.

Those who were taking AEDs had an increased prevalence of [bone fractures](#), with 15 fractures in eight subjects. This was compared to four fractures in those who didn't take the medication.

The study also analysed each subject's bone density and found one important measure of [bone density](#) was 14% lower in the group taking AEDs.

AED therapy remains the mainstay of treatment for most people with epilepsy. There is increasing awareness of the adverse effects of AED use, including the potentially negative effects on bone health.

"This study will hopefully raise awareness that bone health is an important consideration when managing [young people](#) with anti-epileptic drugs. We need further research to confirm our findings, but our preliminary study suggests that all young people on these agents should remain active wherever possible, and keep up their calcium intake and vitamin D levels", said MCRI researcher Dr. Peter Simm.

There are greater long term implications for growing children on AEDs, as age 12 to early 20s is a critical period for the accrual of bone to adult levels. Children currently on AEDs are being encouraged to take proactive steps towards countering its effects, such as nutrition, exercise and physiotherapy in severe cases, to avoid long-term ongoing problems later in life.

Researchers are still working to discover if it is the muscle or bones which are directly affected which causes these detrimental effects to bone health. Longitudinal studies are required to confirm these changes in the muscle–[bone](#) unit, to determine the effect of individual AEDs on [bone health](#) and to further explore the clinical outcomes.

Grace's Story

Grace, now 18, was diagnosed with adolescent onset epilepsy at age 10. She had her first seizure at her 10th birthday party, when she fell into a pool and had to be rescued by her 14-year-old brother. Her three brothers had all had febrile convulsions and her brother recognised her condition immediately. The condition not only caused seizures, but learning difficulties and social phobia, and at 11 she was put on anti-epilepsy medication.

At 14 it was discovered Grace had a GABA receptor mutation that was causing her epilepsy. Her mother Lisa said this was a relief as all her children had had seizures and, a common associated side effect, problems with learning, so knowing it was a genetic problem helped to better understand the issues. Grace is now on new anti-epileptic medication, and her social confidence has really improved. She's planning a career working front-of-house in hospitality.

Provided by Murdoch Children's Research Institute

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