

Do tribal community children show varied antiepileptic response?

With all great interest, we read the recent article by Minz P *et al.* titled “Effects of anticonvulsant drugs on liver enzymes among children in a tribal state of India: A longitudinal study.”^[1] Epilepsy is a prevalent neurological condition whose effects are impacted by societal and cultural factors, particularly in India. Over 50 million people worldwide suffer from epilepsy, with more than 80% living in low- and middle-income nations like India. The World Health Organisation (WHO), the International League against Epilepsy (ILAE), and the International Bureau for Epilepsy (IBE) led the Worldwide Campaign Against Epilepsy to bring the disease out of the gloom, provide more information and raise awareness about epilepsy, and strengthen both private and public efforts to improve care and reduce the disease’s impact.^[2] Anti-epileptic drugs (AEDs) were linked to bone abnormalities in both adults and children. The most serious warnings of such conditions are osteopenia or osteoporosis, osteomalacia, and fractures. Bone disease has been reported in numerous pediatric populations using AEDs.^[3] Vitamin D deficiency should be examined if a child has a mental disability or developmental delay, has been on AEDs, or is taking medications that cause hepatic enzyme induction.^[4] Several studies have revealed that children who are given phenytoin have hypocalcemia and hypophosphatemia, which lead to increased vitamin D catabolism. When compared to matched controls, valproic acid therapy resulted in lower bone mineral density (BMD) in epileptic children, including the femoral neck, radius, and lumbar spine. Children treated with carbamazepine for epilepsy showed reduced blood levels of vitamin D metabolites, hyperparathyroidism, and normal calcium and phosphate levels in most trials.^[5,6] Thus, there is mounting evidence that epilepsy, and its treatment can have an impact on bone mineralization and calcium metabolism [Table 1].

Bone remodeling is a lifetime process in which the skeleton is constantly resorbed and rebuilt in order to preserve skeletal integrity. Serum bone-specific alkaline phosphatase (bALP), amino-terminal propeptide of type III procollagen (PIIINP), carboxy-terminal propeptide of type I procollagen (PICP), osteocalcin (OC), and urinary N-telopeptide of type 1 collagen bone (NTx) are markers of bone formation and bone resorption, respectively.^[5] AEDs have been linked to a variety of bone abnormalities, ranging from problems of bone mineral metabolism to decreases in BMD that increase fracture risk. So, if we conduct studies on children, whose bones are still growing and particularly in tribal community of India who have a low income level, employing any of the above bone indicator factors will be beneficial in determining the detrimental effects of AEDs on bone and calcium metabolism.

Tribal communities often face unique challenges that hinder access to essential healthcare services, particularly affecting the diagnosis and treatment of epilepsy among children. The scarcity of healthcare resources in these regions contributes to delayed interventions and compromises the overall health outcomes for tribal children with epilepsy. The economic challenges prevalent in tribal communities further exacerbate the healthcare disparities.^[7] As a result, children may not receive the consistent and appropriate treatment needed to effectively control their condition, leading to increased risks of related complications. The inability to access regular healthcare check-ups and follow-up appointments is another critical issue faced by tribal communities. Infrequent medical visits hinder healthcare professionals’ ability to monitor the progress of epilepsy treatment and adjust medications as needed. Improper nutrition within tribal communities exacerbates the challenges of managing epilepsy among children, as essential nutrients play a crucial role in seizure control. Inadequate access to balanced diets may complicate the management of epilepsy.

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Table 1: Effects of phenytoin, valproic acid, and carbamazepine on bone and calcium metabolism

Drug	25-hydroxyl vitamin D	Calcium/phosphate	Parathyroid hormone	Bone mineral density
Phenytoin	Decreased	Decreased	Increased	Decreased
Valproic acid	Normal	Normal	Normal	Decreased
Carbamazepine	Decreased	Normal	Increased	Decreased

Conflicts of interest

The author (s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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