

# Calcium, 25(OH) vitamin D, and bone Alkaline phosphatase in children with epilepsy receiving antiepileptic drugs in University of Port Harcourt Teaching Hospital

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## Objectives:

The objective of this study was to analyse bone mineral status in children with epilepsy, on antiepileptic drugs (AEDs) regimen, using serum calcium, 25 (OH) vitamin D and Bone alkaline phosphatase (BALP) and compare these with age and sex matched controls.

**Patients and Methods:** This was a case - control study, conducted at University of Port Harcourt Teaching Hospital, from September 1 2018 to May 31 2019, with 200 (100 cases and 100 controls) participants, aged 1 - 18 years. Serum calcium, 25 (OH) vitamin D and BALP were analysed in children consecutively recruited using o-Cresolphthalein colorimetry for calcium, ELISA for BALP and 25 (OH) vitamin D. Student's t test was used to compare mean among cases and controls and correlation analysis to test relationships between variables.

## Results:

- Serum calcium and vitamin D were significantly lower in cases, but BALP was higher ( $P > 0.001$ ).
- Twenty two percent of cases were below normal vitamin D levels, as against 11% of controls ( $p = 0.05$ ), while sixty two percent of cases had hypocalcaemia as against 27% of controls ( $p > 0.001$ ).
- Cases receiving carbamazepine had lower vitamin D and calcium levels than those receiving phenobarbitone and sodium valproate, but those on sodium valproate had higher BALP.
- Children on polytherapy had lower vitamin D and calcium but higher BALP levels.
- Though not significant, there were negative correlations between BALP and vitamin D, but positive correlations between calcium and vitamin D and calcium and BALP

Variables	Study group		t test	p-value
	Cases Mean ± SD	Controls Mean ± SD		
Serum vitamin D (ng/mL)	46.53±24.46	56.55±30.43	-2.569	0.011*
Serum calcium (mmol/L)	2.09±0.16	2.27±0.15	-7.570	0.0001*
Serum BALP (µg/L)	84.85±52.54	56.83±26.94	4.741	0.0001*

Table 1: Mean serum levels of 25(OH) vitamin D, Calcium, And bALP of subjects showing significantly lower levels in cases than controls

Variables	Duration of anti-epileptic drug therapy in years	
	Pearson Correlation co-efficient (r)	p-value
Serum vitamin D (ng/mL)	-0.145	0.150
Serum calcium (mmol/L)	-0.236	0.018*
Serum BALP (µg/L)	-0.069	0.499

Table 2: Relationship between mean serum levels of 25 (OH)D, Calcium and BALP and the duration of antiepileptic therapy in study cases showing a negative correlation that was significant for Calcium

## Conclusion:

- Mean serum calcium and 25 (OH)D levels in children on AEDs in UPTH are lower than AED apparently healthy controls
- Mean serum bALP level children on AEDS is significantly higher than apparently healthy controls in UPTH
- The prevalence of hypocalcaemia in children on AEDS in UPTH is high.
- The longer the duration of therapy, the lower the serum 25 (OH)D levels in children on AED
- Cases on AED polytherapy had significantly lower serum 25 (OH)D levels than those on monotherapy

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