25- HYDROXY VITAMIN D STATUS AMONG CHILDREN WITH ALL

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Introduction

- Vitamin D status is deficient or insufficient in a significant percentage of children with cancer at diagnosis and at end of therapy with prevalence ranging from **14% to 49%.**
- Our aim was to assess vitamin D status and bone mineral density (BMD) in children newly diagnosed with acute lymphoblastic leukemia (ALL) and to determine whether vitamin D status impact the BMD and the onset of osteonecrosis.

Materials and Methods

- Data was collected prospectively from **50** children under the age of 18 years, diagnosed with acute lymphoblastic leukemia between February 2013 and December 2014.
- Therapy was according to a modified St. Jude total XV protocol.
- 25(OH)- Vitamin D level was assessed based on AAP criteria.
- Children with insufficient or deficient levels were treated with 25(OH)-Vitamin D3 at a dose of 50,000 units/week for 8 weeks followed by a daily maintenance dose of 1000 unit if the level normalizes, and the initial dose was repeated for another 8 weeks if the level didn't normalize.
- Bone mineral density (BMD) was assessed at diagnosis by measuring the Z-score of lumbar spine (L1 to L4)
- DEXA scan was repeated after 6 months in those children with initial abnormal scan and after one year in those with normal scans.

Results

Patients characteristics, Initial 25-OH Vitamin D levels and DEXA scan

Characteristics	N = 50
Age at cancer diagnosis (years)	
Median	5
Range	1-18
Gender, n (%)	
Male	32 (64%)
Female	18 (36%)
Initial 25-Hydroxy Vitamin D level, n (%)	
Deficient (<10 ng/dl)	5 (10%)
Insufficient (10-20 ng/dl)	22 (44%)
Sufficient (>20 ng/dl)	23 (46%)
Initial DEXA scan (Z-score), n (%)	
Low bone density (≤ -2.0)	16 (40%)
Normal bone density (> - 2.0)	24 (60%)

- **6 months follow up:**
- **49 (98%)** had adequate 25(OH) vitamin D level.
- **6** patients with abnormal DEXA scan normalized, and **6** labeled as normal at diagnosis became abnormal.

Correlation of Initial 25-OH Vitamin D level with Initial DEXA scan

25-Hydroxy Vitamin D level	N	Initial DEXA scan	
		Normal	Abnormal
≥ 20 mg/dl	17	9 (52.9%)	8 (47.1%)
< 20 mg/dl	23	15 (65.2%)	8 (34.8%)
P-value			0.433

- **Avascular Necrosis:**
- **Two** children developed AVN
- Both had low 25(OH)-vitamin D level at diagnosis, and one had abnormal DEXA scan.

Conclusions

- Significant number of children newly diagnosed with ALL has deficient/insufficient levels of 25(OH)-vitamin D and abnormal DEXA scans at diagnosis.
- There was no correlation between 25(OH) vitamin D levels and bone density.
- Treatment of vitamin D deficient children with ALL did not improve bone density or reduced complication related to ALL therapy.
- Changes in bone density along the course of therapy was probably related to the direct effect of chemotherapy, steroids, or both on bone mass formation.