Vitamin D and Metabolic Bone Parameters in Preterm Neonates

We measured serum levels of 25-hydroxy vitamin D (25(OH) D) in 79 preterm neonates (≤32 wk), and correlated it with serum ionized calcium (Ca^{++}) levels at 48-72 h and serum phosphorus and alkaline phosphatase levels at 2-3 weeks of age. The mean (SD) 25 (OH)D level was 14.8 (7.0) ng/mL. 25(OH)D levels had a weak positive correlation with Ca^{++} (r=0.299) and phosphorus (r=0.186), and a negative correlation with alkaline phosphatase (r=-0.523).

Keywords: *Hypocalcemia, Neonate, Prematurity.*

Osteopenia or metabolic bone disease of prematurity has been reported in 55% of extremely low birth weight (ELBW) and 23% of very low birth weight (VLBW) infants [1]. Low phosphorus and high alkaline phosphatase (ALP) are highly sensitive and specific for diagnosing osteopenia of prematurity [1].

Although studies from around the world have reported that preterm infants are deficient in vitamin D at birth [2-6], exact role of active form of vitamin-D in fetal bone mineralization is unclear. Chronic maternal vitamin D deficiency has been shown to adversely affect fetal skeletal development [7]. Preterm infants may have reduced Vit D stores as early delivery may curtail the transplacental transfer that happens between 25 weeks of gestation and term. Maternal deficiency may further restrict the transplacental transfer [7].

We conducted a cross-sectional study at a tertiary-level neonatal unit in Bangalore, Southern India, to determine the 25(OH)D levels of preterm infants ≤32 weeks at 48-72 hours and correlate them with serum ionized calcium (Ca^{++}) levels at 48-72 hours of life and serum phosphorus and ALP levels at 2-3 weeks postnatal age. The 25(OH)D levels were determined using chemiluminescent microparticle immunoassay (ARCHITECT i1000SR, Abott Diagnostics, Lake Forest, IL, USA). Ca^{++} levels were measured using potentiometry (Gem Premier 3000, Instrumentation Laboratory, Bedford, MA, USA). Phosphorus levels were measured using spectrophotometry (BioSystems BTS 350, Quezon City, Philippines). ALP levels were determined using absorbance photometry (Cobas C 111, Roche Diagnostics Limited, Rotkreuz, Switzerland).

Seventy-nine preterm neonates were included in the study. The mean (SD) gestational age (GA) and birth weight were 29.8 (2.5) weeks and 1438.1 (464.8) g, respectively. The mean (SD) 25(OH)D level was 14.8 (7) ng/mL (***Table* I**). Forty-eight (60.8%) neonates had Ca^{++} levels <1 mmol/L, 32 (40.6%) had phosphorus levels <4 mg/dL, and 31 (39.2%) had ALP levels >500 U/L. All the infants had Ca^{++} ≥1 mmol/L at 2-3 weeks. Weak positive correlation was found between 25 (OH) D and Ca^{++} (r= 0.299, P<0.05), and also 25 (OH) D and phosphorus (r=0.186, P=0.101). Moderate negative correlation was found between vitamin D and ALP (r=-0.523, P<0.05). Weak correlation was also found between GA and 25(OH)D (r=0.422, P<0.05), GA and phosphorus (r=0.495, P<0.05), and GA and ALP (r=-0.523, P<0.05).

Potential limitations of the study include lack of the maternal 25(OH)D levels and neonatal parathyroid hormone levels; the neonatal 25(OH)D levels at 2-3 weeks; and bone mineral density readings.

Preterm neonates born at ≤32 weeks, especially <28 weeks tend to have low Vitamin D levels and hypocalcemia at 48-72 hours of life, and may develop hypophosphatemia and elevated ALP levels at 2-3 weeks, but a strong correlation could not be elicited between these parameters.

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TABLE I SERUM 25-HYDROXY VITAMIN D, CALCIUM AND PHOSPHORUS IN PRETERM NEONATES

Characteristics	*All infants (n=79)*	*Infants born <28 weeks (n=17)*	*Infants 28-32 weeks (n=62)*
Males	44 (55.7)	7 (41.2)	37 (59.7)
Gestational age (weeks)*	29.8 (2.5)	25.6 (1.3)	31 (1.2)
Birth weight (g)*	1438.1(464.8)	842.9(168.9)	1601.3 (378.1)
25(OH)D at 48-72 (ng/mL)*	14.8 (7)	10.1 (5.6)	16.1 (6.9)
Infants with 25(OH)D <30 ng/mL	78 (99.9)	17 (100)	61 (98.4)
Infants with 25(OH)D <20 ng/mL	59 (74.7)	16 (94.1)	43 (69.3)
Infants with 25OHD <10 ng/mL	31 (39.2)	10 (58.8)	21 (33.9)
Ca^{++} at 48-72 hours (mmol/L)*	0.95 (0.13)	0.91 (0.13)	0.96 (0.13)
Phosphorus at 2-3 weeks (mg/dL)*	4.1 (1.1)	3.1 (1)	4.4 (0.9)
ALP at 2-3 weeks (U/L)*	460.7 (160.5)	597 (188.7)	423.3 (138.2)

*Values in No. (%) or * mean (SD).*

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Immune Thrombocytopenic Purpura in Children of Eastern Henan Province, China

In this retrospective cohort study conducted in 63 children with idiopathic thrombocytopenic purpura (ITP) in China; petechiae, bruises and bleeding were the major presentations. Most cases required therapy with one/more treatment options.

Keywords: *Clinical profile, Thrombocytopenia, Treatment*

Immune thrombocytopenic purpura (ITP) is an acquired autoimmune hematologic condition characterized by destruction of platelets leading to isolated thrombocytopenia [1,2]. It is customarily a self-limiting ailment in otherwise healthy children presenting with bruising, purpura, petechiae, mucosal bleeding, and thromvocytopenia, plasma anti-platelet antibodies, and rise in megakaryocytes [3-5].

This retrospective study was performed in the pediatric ward and outpatient clinic of a tertiary hospital in eastern Henan province, China over a period of five years (August 2009 to September 2014) to describe clinical features in children with ITP. The study target population included children below 18 years' age diagnosed with ITP [as per International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) 2010 D69.3] and treated at the hospital. A questionnaire was used for collection of clinical and demographic data of the children based on medical (hospital/clinic) records. Information on prescription drugs to patients and treatment outcome were collected. The diagnosis was based on clinical history as well as physical examination~ along with tests revealing isolated thrombocytopenia (platelet count $<100\times10^9$/L), normal peripheral blood smear, white blood cells, and no underlying malignancies and conditions. Details on bone marrow examination if carried out were also collected. Chronic ITP was defined as persistent thrombocytopenia, lasting greater than six months after the initial diagnosis. The study got the approval from the institutional Ethics Committee.

Of the 63 children studied, 73% were diagnosed with acute ITP and 27% with chronic ITP. Acute ITP and chronic ITP were more prevalent in boys (52.2% and 58.8%, respectively) compared to girls (47.8% and 41.2%, respectively), though insignificant. Nearly 20.6% of children had family history of ITP (***Table* I**). Bone marrow aspiration was performed in 36 (57.1%) cases to exclude other pathology; all of which confirmed the diagnosis. No significant seasonal difference was noted. History of preceeding viral infection was frequent in relation to both acute and chronic ITP (73.9% and 64.7%). The most widely used treatment for children was intravenous immunoglobulin (IVIG) (61.9%) followed by