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To study the association of vitamin d level in late onset neonatal sepsis

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Introduction: Systemic infection is one of the leading causes of mortality and morbidity in the neonates and is responsible for about 30 - 50% of the total neonatal deaths in developing countries. Vitamin D is a steroid hormone which plays an important role not only in regulating body levels of calcium and phosphorus, and in mineralization of bone but also plays an important role in modulation of neuromuscular and immune function and reduction of inflammation.

Design: Prospective case- control study.

Aims and objectives: To assess vitamin D level in neonates with late onset sepsis and compare it with the vitamin D levels of healthy controls and also see the correlation of Vitamin D levels with sepsis, to study the correlation of Maternal and Infant vitamin D level.

Methods: This observation study was conducted from September 2015 to February 2016 in neonatal intensive care unit (NICU) of a tertiary care hospital. Out born term and late preterm neonates of >7 days and less than 28 days, with signs and symptoms of severe sepsis with positive sepsis screen were enrolled as Cases and Neonates with the same gestational age and/or weight without sepsis were enrolled as Control. Neonates in whom there was history of previous hospitalization for more than 48 hours and whose calcium profile was abnormal were excluded. At the time of admission Sepsis screen, Blood Culture, Urine C/S, CSF Culture and Chest X-ray was done at admission. Levels of 25-OHD were assessed by chemiluminescent immunoassays method, by using Beckman Access 2 Immunoassay System (Germany). All neonates were further evaluated as Pneumonia, Meningitis, UTI or Blood culture +ve sepsis and followed till discharge or death. Odds ratios were used to measure the association between vitamin D deficiency in neonatal sepsis in comparison to healthy controls.

Results: Total 421 neonates admitted to NICU from September 2015 to February 2016, out of which 120 fulfilled the inclusion criteria. Only 60 consecutive neonates were included in the study as cases and 60 neonates with same gestational age and or weight with septic screen negative were enrolled as controls. Out of 120 infants, 77 (64%) were male and 42 (36%) were female, as shown in figure-4. The mean age of presentation for study and control group was 15.53 ± 6.429 days and 13.48 ± 6.738 days respectively. Mean weight and gestation age in both case and control group were comparable. Mean duration of hospital stay for study group was 10.68 ± 8.11 days and for controls it was 3.30 ± 0.77 days. Mean gestation age at admission for case and control was 37.78 ± 1.66 and 37.68 ± 1.82 weeks respectively. The mean serum 25(OH)D concentrations in neonates with LOS (study group) was lower (15.37 ± 10) than those of the healthy neonates (21.37 ± 9.53) ($p < 0.05$) with a Odd's Ratio of 1.7. Maternal vitamin D level was also statistically significant in both study and control group.

Conclusion: Vitamin D levels < 30 ng/ml has high association with late onset sepsis. Treatment should be aimed for early detection of vitamin D deficiency and timely supplementation in neonates with sepsis.

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