

Non-Thyroidal Illness Syndrome and Its Prognostic Significance in Pediatric Septic Shock: A Cross-Sectional Analysis

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Abstract : Background and Aims: Pediatric septic shock, a life-threatening condition, is associated with significant morbidity and mortality. Dysregulation of thyroid function, presenting as Non-Thyroidal Illness Syndrome (NTIS), is a common observation in critically ill patients and may impact clinical outcomes. This study investigates the thyroid hormone profile in pediatric septic shock and its correlation with disease outcomes. Methods: A cross-sectional study was conducted in the Pediatric Department of VMMC and Safdarjung Hospital, New Delhi. Ninety-one children, aged 1 month to 12 years, diagnosed with septic shock were included. Thyroid function tests (Total T3, Total T4, Free T3, Free T4, and TSH) were measured upon admission. Outcomes were categorized as favorable (shock reversal within 24 hours, ICU stay <7 days) or unfavorable (prolonged shock, ICU stay >7 days, multiorgan dysfunction syndrome [MODS], or death). Statistical analysis included logistic regression and receiver operating characteristic (ROC) curve evaluation. Results: Thyroid hormone abnormalities were prevalent, with low Total T3 (84.6%), low Total T4 (70.3%), and low Free T3 (76.9%) being the most common findings. Significant associations were observed between low levels of Total T3, Total T4, Free T3, and Free T4 with unfavorable outcomes ($p < 0.001$ for all). ROC analysis identified Free T3 as the strongest predictor of unfavorable outcomes, with an AUROC of 0.842. Conclusions: Thyroid hormone levels, particularly Free T3, are critical prognostic markers in pediatric septic shock. Timely monitoring of thyroid function could aid in risk stratification and therapeutic decision-making. Future research should focus on the potential benefits of thyroid hormone replacement therapy in this population.

Keywords : pediatric septic shock, thyroid function, non-thyroidal illness syndrome, prognostic markers, free T3

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