

# Is there any correlation between thyroid function test on first day of admission in critically ill children and disease severity or outcome?

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**Background:** Sick euthyroid syndrome (SES) is the most common endocrine disorder in critically ill patients. It has been shown that the decrease in T4 levels correlates with disease severity and prognosis. Whether SES is a compensatory response to the disease course or needs to be treated is not known yet.(1,2,3)

**Objectives:** To our knowledge, there are only a few studies on critically ill infants and children investigating the correlation between thyroid function and disease severity as well as its outcome. Therefore, this study aimed to investigate thyroid hormone levels in critically ill patients.

**Methods:** In this study, thyroid function tests including thyroid stimulating hormone (TSH), total T3 (TT3), free T3 (FT3), total T4(TT4), free T4 (FT4), and reverse T3 (rT3) were measured in 35 critically ill children admitted to intensive care unit (ICU) on first day of admission. Disease severity was evaluated using pediatric logistic organ dysfunction score (PELOD). Then the patients were divided into groups of survivors and non-survivors and the results were compared between these two groups accordingly.

**Results:** Thirty-five patients, including 19 (54.3%) female and 16 (45.7%) male, with the mean age of 2 years (SD:3.8 years, range: 4 months-15 years) had entered the study based on the inclusion criteria. 25 (71.6%) patients were transferred from PICU to other wards and 10 (28.4%) patients died. Age and sex were not statistically different in survivors and non-survivors ( $P > 0.05$ ). It was revealed that there was a significant reduction in mean TT3 levels in non-survivors compared to survivors on the first day of admission ( $P = 0.007$ ).

**Conclusions:** Thyroid function assessment, especially TT3 on the first day of admission, along with PELOD score, might be helpful in predicting disease outcome and patient's survival.

#### References:

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- 2.Vasa FR, Molitch ME. Endocrine problems in the chronically critically ill patient. Clin Chest Med. 2001;22(1):193-208. [PubMed:11315456]
- 3.Kaptein EM, Weiner JM, Robinson WJ, Wheeler WS, Nicoloff JT. Relationship of altered thyroid hormone indices to survival in nonthyroidal illnesses. Clin Endocrinol (Oxf). 1982;16(6):565-74. [PubMed:7105428].

Table: PELOD Parameters and Thyroid Function Tests in Survivors and Non-Survivors on the First Day of Admission

Figure: Comparison of TT3 level on the first day of admission in two groups

	Survivors(n=25) (Mean±SD)	NonSurvivors(n=10) (Mean±SD)	P value
PELOD	10.08±8.39	25.50±14.44	0.008
TT3	100.46±27.60	76.70±18.85	0.007
TT4	6.40±1.57	5.1±2.32	0.132
FT3	3.36±0.88	3.07±1.36	0.46
FT4	1.10±0.29	0.90±0.29	0.078
TSH	3.16±6.10	5.73±6.97	0.67
rT3	0.33±0.24	0.43±0.24	0.276

