

**Hypothyroidism Is Associated With Lower Mortality in Hospitalized Patients with Cirrhosis**

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The liver is involved in the synthesis of thyroid binding proteins, the peripheral conversion of T4 to T3, and thyroid hormone conjugation and excretion. Consequently, liver dysfunction is associated with a decrease in thyroid hormone levels. Previous studies have supported thyroid hormone levels to have a predictive role for survival in critically ill patients. Here, we seek to evaluate if hypothyroidism influences survival in hospitalized patients with cirrhosis.

The National Inpatient Sample (NIS) is an inpatient database comprising approximately 20% of all inpatient admissions to hospitals in the United States. From the database, we collected data from hospitalized patients with cirrhosis listed as primary or secondary diagnosis and divided them into two subgroups: those with a diagnosis of hypothyroidism and those without. We reviewed and compared the two groups for mean hospital length of stay in days, Charlson comorbidity index as well as rates in mortality. IBM Statistical Package for the Social Sciences (SPSS) was used for statistical analysis.

A total of 338,990 cases of patients from the 2012-2014 NIS database had cirrhosis as primary or secondary diagnosis. 35,135 of these patients (10.36%) had hypothyroidism. The mean length of hospital stay in patients with cirrhosis and hypothyroidism was 5.1 days and 4.9 days for those without hypothyroidism. Charlson comorbidity index was significantly higher ( $p < 0.05$ ) in cirrhotic patients with hypothyroidism. In the patients with cirrhosis, the mortality was 4%. In the subgroup with hypothyroidism, the mortality was 3.2% while the other subgroup without hypothyroidism was 4.1%. After adjusted for age, sex, race, and the Charlson comorbidity index, the group of patients with hypothyroidism had lower mortality (OR: 0.74, 95% CI (0.7-0.8)).

Our results show that cirrhotic patients with hypothyroidism had a higher comorbidity but a lower rate of mortality in the hospital than those without hypothyroidism. A review of the literature showed no consensus of suppressed total thyroid hormone level and its association with mortality. Some studies demonstrate that lower fT3 levels are directly associated with severity of liver disease and that lower fT3 was associated with higher mortality risk in the ICU setting. Further studies should be done to explore this association.