ORIGINAL RESEARCH PAPER

General Medicine

A STUDY ON EVALUATION OF THYROID FUNCTION TEST IN PATIENTS WITH CHRONIC LIVER DISEASE

KEY WORDS: Diabetes, clinical features , Risk factors.

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ABSTRACT

INTRODUCTION: Liver plays an important role in metabolism and modification of several hormones, including thyroid hormones. Therefore, the circulating thyroid hormone concentrations are affected by hepatic disorders. The most consistent thyroid hormone profile in patients with CLD are low total and free T3 and an elevated rT3, changes similar to sick euthyroid syndrome. **AIMS :** To find out relation of thyroid hormone level with severity of chronic liver disease. **METHOD :** A cross sectional study was conducted to evaluate thyroid function in 100 patients of chronic liver disease. **RESULT :** Serum fT3 & fT4 level fall significantly along with progression of liver disease, values were inversely related with disease severity. However, TSH value was not significantly changed with severity of liver disease. **CONCLUSION:** Since, there is significant inverse correlation between serum level of T3, FT3, and FT4 with severity of cirrhosis, these parameters can be used as markers to indicate the severity of cirrhosis.

INTRODUCTION:

The liver has an important role in thyroid hormone metabolism because it manufacture proteins that bind thyroid hormone such as thyroxine binding globulin (TBG), pre-albumin and albumin. It is also the major site of thyroid hormone peripheral metabolism and is involved in its conjugation & biliary excretion, oxidation, deamination and extrathyroidal-deiodination of thyroxine (T4) to triiodothyronine (T3) and reverse T3. Although almost all patients with liver disease are clinically euthyroid, some abnormalities in circulating hormone concentrations have been shown in various studies conducted in past. The data collected so far are still controversial as they depend on the different analytical methods used as well as the different groups of patients investigated. So, we have conducted this study to find out a better result.

AIMS AND OBJECTIVES:

1. To study thyroid hormone abnormality in chronic liver disease patients.
2. To find out whether these abnormalities co-relate with severity of chronic liver disease.

METHODS AND MATERIALS:

Chronic liver disease has been diagnosed on the basic of liver disease more than 6 months duration and/or evidence of portal hypertension on USG or upper GI endoscopic finding typical of CLD. These subjects are classified as per child Pugh criteria

A. Child Pugh Stage – A (Chronic liver disease 1 or CLD 1)
B. Child Pugh Stage – B or C (CLD 2)

The score employs five clinical measures of liver disease. Each measure is scored 1-3, with 3 indicating most severe derangement.

Measure	1 point	2 points	3 points
Total bilirubin ìmol/l(mg/dl)	<34(<2)	34-50(2-3)	>50(>3)
Serum albumin g/dl	>3.5	2.8-3.5	<2.8
Prothrombin time prolongation(secs)	<4.0	4.0-6.0	>6.0
Ascites	None	Mild to moderate (diuretic responsive)	Severe (refractory to diuretics)
Hepatic encephalopathy	None	Grade I-II	Grade III-IV

INTERPRETATION:

Points	Class
5-6	A
7-9	B
10-15	C

Class A is considered as CLD1, Class B & C are considered as CLD2.

fT3, fT4 and TSH has been measured by chemiluminescence method.

1. Study Area: Dept. of General medicine, PMCH, Patna.
2. Sample Size: 100 Patients.

3. Study Population: Patients being treated in general medicine dept. of PATNA MEDICAL COLLEGE AND HOSPITAL.

4. Study Period: Two years.

5. Selection Criteria:
Inclusion Criteria-
i. All patients above 14 years old.
ii. Patients with clinical, biochemical, and radiological evidence of cirrhosis of liver.

Exclusion Criteria-
i. Patients who have received thyroid hormone before for thyroid dysfunction.
ii. Alcoholic liver disease patients.

6. Study Design- Cross Sectional Study.

7. Statistical Methods
Categorical variables are expressed as Number of patients and percentage of patients and compared across the groups using Pearson's Chi Square test for Independence of Attributes/ Fisher's Exact Test as appropriate.

Association between continuous variables captured using Spearman's Rank Correlation Coefficient.

The statistical software SPSS version 20 has been used for the analysis.

An alpha level of 5% has been taken, i.e. if any p value is less than 0.05 it has been considered as significant.

RESULT:

A total of 100 patients were taken for analysis. Among these 100 patients, a total of 28 patients were in child class A (28%). Out of these 28 patients, 14 (50%) were male and 14 (50%) were female. In child pugh B, there were 49(49%) patients. Among them, 31 were male (63.27%) and 18 (36.73%) were female. In child class C, among 23 (23%) patients, 18 (78.26%) were male and 5 (21.74%) were female. In respect of CLD stage, CLD-1 included 28 patients with 14(50%) male and 14(50%) female among them. CLD stage-2 included 72 patients among which 49 (68.06) were male and 23 (31.94%) were female.

Regarding etiology of CLD, 42 patient was isolated Hepatitis B related, 15 patients isolated hepatitis C related, 4 patients both hep B and hep C positive CLD, 8 was autoimmune CLD, 3 has Wilson disease induced CLD and rest 28 cause was cryptogenic. However, our study is not etiology based study. We have considered only severity of liver disease (Child pugh A, B and C or CLD-1 and CLD-2) irrespective of etiology.

In child pugh class A, mean value of FT3 was 3.06 ± 0.78, in child class B, it was 1.98 ±0.86, in child class C, mean FT3 was 1.37 ± 0.82. Here p value was < 0.001 which is statistically significant. In respect of CLD, for CLD-1 group of patients, mean free FT3 was 3.06 ± 0.78 and in CLD-2, mean FT3 was 1.79 ±0.89, and p value was <0.001 which is statistically highly significant. So, from the above result, it is clear that serum FT3 level fall significantly along with progression of liver disease, value is inversely related with disease severity.

In respect of FT4, in child pugh class A, its mean value is 1.47±0.31, in child class B, mean free T4 value is 1.42 ±0.21 and in child class C, mean is 1.08 ± 0.29. Overall p value is 0.29 and p value A vs B, B vs C and A vs C is 0.556, <0.001 and < 0.001 respectively. So, statistically significant p value is there between child B and C. In respect of CLD class, CLD-1 has average FT4 1.47±0.31 and in CLD-2, mean FT4 was 1.31 ± 0.32, and p value is 0.020 which is statistically significant.

Considering TSH level, mean value of it in child A class was 2.54 ±1.06, in child class B, mean value was 2.72± 2.14 and in child C, mean value was 3.41±1.72. Overall p value was 0.351 which is statistically not significant. In CLD stage, CLD-1 has mean TSH 2.54 ±1.06 and CLD-2 had mean TSH 2.94±2.03 and p value here 0.920 which is statistically insignificant. So, FT4 level also decrease along with disease severity but this is less significant compared to Ft3.

So, TSH value is not significantly change with severity of liver disease.

CONCLUSION:

From our study, we concluded that there is a significant inverse relationship between severity of chronic liver disease and FT3 and FT4. This inverse relation is more marked in case of FT3 compared to FT4. However relationship between TSH and severity of liver disease is statistically not significant. We have recommended the baseline assessment of thyroid function test in all patient with chronic liver disease. An etiology wise study may help better to understand thyroid dysfunction in chronic liver disease. However, from our current study, we can conclude that FT3 measurement can be used as a marker to assess the severity of chronic liver disease.

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