A Study of Thyroid profile in Cirrhosis of Liver and its Correlation with Child-Pugh Score

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Abstract

Background: The Child-Pugh scoring system was designed to predict mortality in cirrhosis patients. Originally conceptualized by Child and Turcotte in 1964 to guide the selection of patients who would benefit from elective surgery for portal decompression, it broke down patients into three categories: A - good hepatic function, B - moderately impaired hepatic function, and C - advanced hepatic dysfunction. **Methods:** cross-sectional study, **Study setting:** Medicine department of Tertiary care center. **Study population:** The study population included all the cases of cirrhosis of liver admitted in tertiary care center. **Sample size:** 100 **Results:** majority of cases were found in above 60 years group e.g.30 followed by 51-60 years age group 28 cases, 22 cases in 41-50 years age group,17 in 31-40 years age group and 3 cases in 18-30 years age group. majority of study participants were Males contributing 92 (92%) and Females 08 (08%). majority of cases presented with yellowish discoloration of eyes e.g. 84 cases followed by swelling over both lower limbs found in 77 cases, abdomen distention observed in 69 cases and 22 cases found with altered 1083behavior. majority of cases found with normal thyroid function test e.g. 75 followed by 17 cases presented with Hyperthyroidism and 8 cases with hypothyroidism. There is statistically significant correlation between Child – pugh Class with age. **Conclusions:** majority of cases were found in above 60 years group ,There is statistically significant correlation between Child – pugh Class with age.

Keywords: Cirrhosis of Liver,Risk factors, Child – pugh Class, Thyroid profile

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Introduction

The Child-Pugh scoring system was designed to predict mortality in cirrhosis patients. Originally conceptualized by Child and Turcotte in 1964 to guide the selection of patients who would benefit from elective surgery for portal decompression, it broke down patients into three categories: A - good hepatic function, B - moderately impaired hepatic function, and C - advanced hepatic dysfunction.

Their original scoring system used five clinical and laboratory criteria to categorize patients: serum bilirubin, serum albumin, ascites, neurological disorder, and clinical nutrition status.[1] The scoring system was modified later by Pugh et al., substituting Prothrombin time for clinical nutrition status. Additionally, they introduced variable points for each criterion based on increasing severity [2]

Historically the Child-Pugh classification was used for liver transplant allocations. However, there were three primary limitations to its use: 1) grading ascites and encephalopathy require a subjective assessment, 2) the classification system does not account for renal function, and 3) there are only ten different scores (based on points) available.

This last limitation was significant because patients were not able to be adequately differentiated based on the severity of the disease, and therefore wait time had a considerable impact on prioritization.[3] Practically speaking, a patient with an INR of 6 and bilirubin of 14 could potentially have the same Child-Pugh score as a patient with an INR of 2.3 and bilirubin of 4.0.

The MELD score, which has a broader range of more continuous variable values, was created to account for these differences. The original MELD score calculation used the patient's bilirubin level, Creatinine level, INR, and cause of liver disease.4 Since then, it has evolved to exclude causes of disease and takes into account the serum sodium level and whether the patient is on dialysis. In clinical terms, cirrhosis is described as are either "compensated" or "decompensated."

Decompensation means cirrhosis complicated by one or more of the following features: jaundice, ascites, hepatic encephalopathy (HE), or bleeding varices. Ascites is the usual first sign.[5] The thyroid gland produces two related hormones, thyroxine (T4) and triiodothyronine (T3). Acting through thyroid hormone receptors α and β, these hormones play acritical role in cell differentiation during development and help maintain thermogenic and metabolic homeostasis in the adult. T4 is secreted from the thyroid gland in about twenty fold excess over T3.

The liver plays an important role in the metabolism of thyroid hormones, as it is the most important organ in the peripheral conversion of tetraiodothyronine (T4) to T3 by Type 1 deiodinase.[6,7] Type I deiodinase is the major enzyme in the liver and accounts for approximately 30%–40% of extrathyroidal production of T3, it can carry out both 5'and 5 deiodination of T4 to T3. Moreover, the liver is involved in thyroid hormone conjugation and excretion, as well as the synthesis of thyroid binding globulin.[8]

T4 and T3 regulate the basal metabolic rate of all cells, including hepatocytes, and thereby modulate hepatic function. The liver metabolizes the THS and regulates their systemic endocrine effects. Thyroid diseases may perturb liver function; liver disease modulates thyroid hormone metabolism; and a variety of systemic diseases affect both the organs.[9]

Aim and Objectives:
- To find out the correlation between of thyroid hormone level and Child-Pugh score
- To study Clinical profile of liver cirrhosis patients.

Material and Methods
Study design: cross-sectional study,
Study setting: Medicine Department of Tertiary care center.
Study population: The study population included all the cases with cirrhosis of liver admitted in tertiary care center.
Sample size: 100
Inclusion Criteria
1. All patients with cirrhosis liver admitted in tertiary care center during study period such cases included in the study.
Exclusion Criteria
1. Known cases of thyroid disorder without liver cirrhosis
2. Patient with history of organ failure, cancer (on radio or chemotherapy) and individual with active infection, cardiac, pancreatic (diabetes), chronic kidney disease
3. Not willing to participate in the study

4. Loss to follow up

Approval for the study:
Written approval from Institutional Ethics committee was obtained beforehand. Written approval of Medicine and Related department was obtained. After obtaining informed verbal consent from all patients with the definitive diagnosis of cirrhosis liver cases admitted to Medicine ward of tertiary care centre such cases were included in the study.

Sampling technique:
Convenient sampling technique used for data collection. All patients admitted in the Medicine department of tertiary care center with cirrhosis of liver such cases were included in the study.

Methods of Data Collection and Questionnaire:
Predesigned and pretested questionnaire was used to record the necessary information. Questionnaires included general information, such as age, sex, religion, occupation, residential address, and marital status, alcohol history, risk factors and date of admission. Medical history- chief complain, past history, general examination, systemic examination.

After taking written and informed consent about enrolment in the study and maintaining adequate privacy and confidentiality, all patients were subjected to a standardized interview. Detailed medical history was taken, and complete general and systemic examinations were done to establish the diagnosis of cirrhosis of liver and rule out association of various risk factors with mortality and morbidity.

Data entry and analysis:
The data were entered in Microsoft Excel and data analysis was done by using SPSS demo version no 21 for windows. The analysis was performed by using percentages in frequency tables and correlation of cirrhosis of liver cases with various risk factors and correlation with morbidity and mortality and correlation of thyroid hormone level with Child-Pugh Score. $P<0.05$ was considered as level of significance using the Chi-square test.

Results And Observations
The present Cross-sectional study was done among100 cirrhosis of liver cases admitted to tertiary care centre during study period.

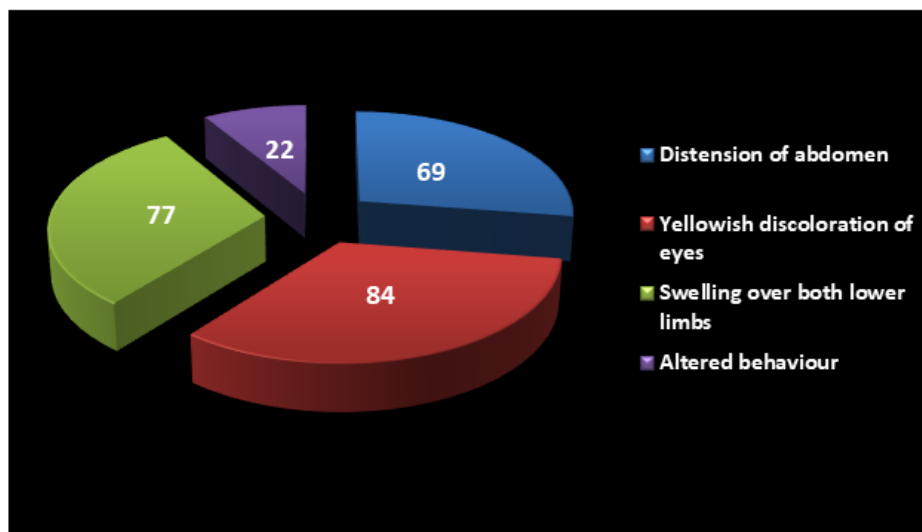**Table 1: Distribution of cases according to age (N=100)**

Age in years	Frequency	Percentage
18-30	3	3%
31-40	17	17%
41-50	22	22%
51-60	28	28%
Above 60	30	30%
Total	**100**	**100 (100%)**

Above table shows that majority of cases were found in above 60 years group e.g.30 followed by 51-60 years age group 28 cases, 22 cases in 41-50 years age group,17 in 31-40 years age group and 3 cases in 18-30 years age group

Table 2: Distribution of cases as per sex (N=100)

Gender	Frequency	Percentage
Male	92	92%
Female	08	08%
Total	**100**	**100 (100%)**

Above table shows that majority of study participants were Males contributing 92 (92%) and Females 08 (08%).

Figure 1: Distribution of cases according to Clinical features (N=100)
The above figure shows majority of cases presented with yellowish discoloration of eyes e.g. 84 cases followed by swelling over both lower limbs found in 77 cases, abdomen distention observed in 69 cases and 22 cases found with altered 1086 behavior.

Table 3: Distribution of cases according to Thyroid disorders (N=100)

Thyroid disorders	frequency	percentage
Hyperthyroidism	17	17%
Hypothyroidism	08	08%
Normal	75	75%
Total	**100**	**100 (100%)**

The above table shows majority of cases found with normal thyroid function test e.g. 75 followed by 17 cases presented with Hyperthyroidism and 8 cases with hypothyroidism.

Table 4: Correlation of Child – pugh Class with age

Age (in Years)	Child – pugh Class C			
	Present (%)	**Absent (%)**	**Total**	**Percentage**
18-30	01 (33.33%)	2 (66.67%)	03	6.67%
31-40	10 (58.82%)	07 (41.18%)	17	53.33%
41-50	12 (54.55%)	10 (45.45%)	22	30%
51-60	17 (60.71%)	11 (39.28%)	28	10%
Above 60	27 (90%)	03 (10%)	30	30%
Total	**67 (67%)**	**33 (33%)**	**100**	**100 (100%)**

The result is significant at $p < .05$.
Inference: There is statistically significant correlation between Child – pugh Class with age.

Discussion
The present Cross sectional study was done among100 cirrhosis of liver cases admitted to tertiary care centre during study period
In current study Table No. 1: Distribution of cases according to age (N=100) majority of cases were found in above 60 years group e.g.30 followed by 51-60 years age group 28 cases, 22 cases in 41-50 years age group,17 in 31-40 years age group and 3 cases in 18-30 years age

group. Similar result found in the study conducted by Shaikh S et al [10] he reported that the most of the cases found in above 60 years age group 47% and 32% cases in 40-60 years age group.

In current study Table No.2: Distribution of cases as per sex (N=100) majority of study participants were Males contributing 92 (92%) and Females 08 (08%).Similar result found in Study done by Waqas Mu [11] he reported that the 131(61.2%) male and 83(38.8%) female patients in the study group with a male to female ratio of 1.6:1.

In present study Figure No. 1: Distribution of cases according to Clinical features (N=100) majority of cases presented with yellowish discoloration of eyes e.g. 84 cases followed by swelling over both lower limbs found in 77 cases, abdomen distention observed in 69 cases and 22 cases found with altered 1087ehavior. Similar result observed in Study done by Manju Sharma et al [12] he reported that the most common complaint was abdomen distention in 82% cases followed by swelling over lower limbs in 76% cases, yellow discoloration of eyes found in 80% cases.

In current study Table No. 3: Distribution of cases according to Thyroid disorders (N=100) majority of cases found with normal thyroid function test e.g. 75 followed by 17 cases presented with Hyperthyroidism and 8 cases with hypothyroidism. Similar result found study conducted by K.V.S.Harikumar et al [13] he reported that the subclinical hypothyroidism (n = 3), primary hypothyroidism (n = 1), Sick Euthyroid syndrome (n = 3), central hypothyroidism (n = 2) and secondary hypogonadism (n = 3).

In current study Table no.4: Correlation of Child – pugh Class with age. There is statistically significant correlation between Child – pugh Class with age. Similar result found in Study done by Mousa et al [14] revealed significant correlation between Child – pugh Class with age.

Conclusions

Majority of cases were found in above 60 years. Most common in Males as compared with female. Hyperthyroidism was most common thyroid disorder among cirrhosis of liver patients. There is statistically significant correlation between Child – pugh Class with age.

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