

## Assessment of Severity of Cirrhosis in Hospitalized Patients

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**Background:** To assess the severity of cirrhosis at the time of presentation to hospital and to seek association between sociocultural, demographic and geographic variables and severity of chronic liver disease.

**Materials & Methods:** One hundred consecutive cases of cirrhosis of liver admitted in Nishtar Hospital, Multan were included in this study. After history, physical examination and relevant investigations, patients were segregated into Child grade A, B and C depending upon the severity of liver disease.

**Results:** Among 100 cases studied, 48 were male and 52 female; the mean age was 47 years (range 20 to 80 years). Majority of the patients were from low socio economic group. Out of 100 cases 72% were from rural areas and 28% were from urban areas. It was found that most of the patients (92%) presented to hospital when their liver disease was advanced (46 patients of Child grade B and 46 patients of Child grade C) while only 8 patients had mild liver disease (Child Grade A). Rural population had more severe disease at the time of presentation as compared to urban population. Poor & middle socioeconomic group had more severe and advanced chronic liver disease as compared to rich class ( $p=0.0306$ ). It was found that female had more severe disease at the time of presentation ( $P=0.0346$ ). Frequency of cirrhosis was found to be more above 40 years of age.

**Conclusion:** Results of this study indicated that cases of cirrhosis of liver are referred to tertiary care units when their disease is advanced with serious complications. Moreover there is a significant association between geographic and socioeconomic status of the patients and severity of cirrhosis. It is recommended that health care personnel should be properly trained for health education and early recognition and referral of the patients of chronic liver disease to tertiary care units. This will prevent complications and will help to decrease the morbidity and mortality.

**Key Words:** Cirrhosis, Child Pugh Classification, Hepatitis B Virus and Hepatitis C Virus.

### Introduction

Chronic liver disease is a major health problem in third world countries leading to repeated hospitalization. In Pakistan, hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are endemic probably due to unsatisfactory hygiene, poor socio-economic conditions and low literacy rate. The carrier rate of HB<sub>s</sub>Ag is quoted to be around 10% in general population while the prevalence of HCV in blood donors<sup>1</sup> is 4.8 %. These viruses may lead to persistent hepatic infection which results in chronic hepatitis and cirrhosis. Five to ten percent individuals infected with HBV and approximately half of patients infected with HCV progress to chronic stage.<sup>2,3</sup> Worldwide 5% of individuals are chronic carriers of HBV, out of which up to 20% may develop cirrhosis.<sup>4</sup> Cirrhosis is the most common cause of hepatitis B related chronic liver diseases in Pakistan accounting for 58% cases followed by hepatocellular carcinoma (22%) and chronic hepatitis (20%).<sup>5</sup>

Cirrhosis continues to be an important cause of morbidity and mortality. Chronic liver diseases pass

through a long period of minimum nonspecific symptoms (compensated) until the stage of ascites, jaundice and encephalopathy is reached (decompensated). Patients are admitted to the hospitals with variable severity of the disease and with different complications like hepatic encephalopathy or severe gastrointestinal bleeding. There are various parameters which are used to classify the severity of liver cirrhosis into different grades. This grading is useful for the management of cases and to predict complications and the outcome. The Child-Pugh classification is a simple, convenient prognostic measure in patients with liver cirrhosis and is used to assess the hepato cellular function. One year survival<sup>6</sup> in good risk (Child grade A & B) patients is about 70% and in bad risk (Child grade C) patients is about 30%.<sup>7</sup> In Pakistan sufficient data is not available regarding severity of chronic liver disease in hospitalized patients. The purpose of this study is to know exactly at which stage the patients of cirrhosis are admitted to the hospital by using Child Pugh scoring system and to analyze the associated socioeconomic, clinical and biological factors that may have contributing potential in the

## Patients and Methods

This hospital based, cross sectional study was carried out in 4 medical units of Nishtar Hospital Multan. One hundred consecutive hospitalized cases of cirrhosis of liver were included in this study from August 2002 to June 2003. The catchment area of Nishtar Hospital Multan includes Southern Punjab and adjacent backward areas of Balochistan and Sindh, where literacy rate is very low and incidence of chronic liver disease is on the rise. All female and male patients above the age of 12 were included. A detailed history was taken with emphasis on the evaluation of symptoms of chronic liver diseases. This included history of jaundice, haematemesis, malena, blood transfusion, needle pricks, surgical procedures and drug abuse. Assessment of the socioeconomic status of the patients was made according to criteria of Federal bureau of statistics Multan. A thorough physical examination was done in all patients, particularly for signs of chronic liver disease and degree of encephalopathy. In addition to routine investigations, serum bilirubin, ALT, serum albumin, prothrombin time, ascitic fluid examination, viral serology and abdominal ultrasonography was obtained. A qualified Sonologist conducted ultrasonography in radiology department. During ultrasonography, texture of liver, size of liver and spleen was noted. Presence or absence of ascites was confirmed and size of portal vein was also determined. Diagnosis of cirrhosis was made clinically and by ultrasonography. A consultant physician and gastroenterologist examined all the included cases. The Child Pugh score<sup>7,8,9</sup> for each patient was calculated (A, B or C) to assess the severity of cirrhosis (**Table-1**). This data in each group was compared, analyzed, correlated with socio-cultural, demographic and geographic variables by using Chi-Square test.

## Statistical Analysis

**Table 1:** Child Pugh classification.<sup>9</sup>

| Clinical and laboratory measurements                    | Patients scored for increasing abnormality |         |          |
|---|--|---------|----------|
|   | 1  | 2       | 3        |
| Encephalopathy (grade)                                  | none                                       | 1 or 2  | 3 or 4   |
| Ascites   | none                                       | mild    | moderate |
| Bilirubin (mg/dl)                                       | 1-2  | 2.1-3   | 3.1      |
| Albumin (g/dl)  | 3.5  | 2.8-3.5 | 2.7      |
| Prothrombin time<br>(Increase in sec above the control) | 1-4  | 4.1-6   | 6.1      |
| Grade (A) 5-6, Grade (B) 7-9 and Grade (C) 10-15        |  |         |          |

Data collected was analyzed by utilizing Statistical Program for Social Sciences (SPSS) version 10.0. Different variables like age, age group, sex were entered and analyzed in the SPSS. Descriptive statistics were generated with percentages for discrete variables and mean and standard deviations for continuous variables. Computation of p-values was done by Chi-square analysis. A p-value of <0.05 was considered significant.

## Results

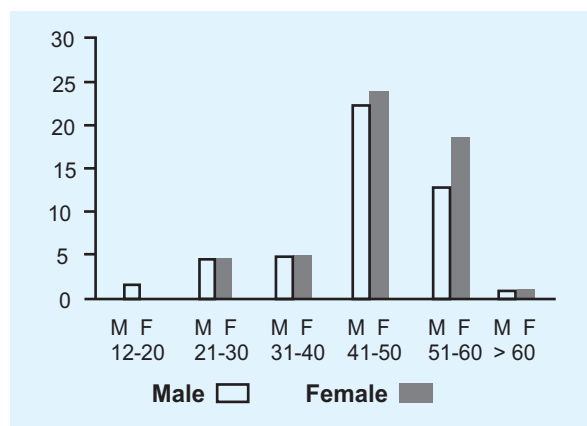
Among 100 cases studied, 8 cases were classified in Child grade A, 46 in Child grade B and 46 in Child grade C. The study population comprised of 48 male and 52 female with male to female ratio of 0.92. The mean age was 47 years with the age range of 20 to 80 years (**Fig-1**). Among 48 male, 4 (9%) were in Child grade A, 28 (58%) and 16 (33%) in Child grade B and C respectively. Of the 52 female, 4 (8%) were in Child grade A, 18 (34%) and 30 (58%) in Child grade B and C respectively (**Table-4**). Only 10% of patients were below 30 years and 90% were more than 30 years. 42% patients belonged to poor socioeconomic class while a considerable number of patients (54%) belonged to middle socioeconomic group. Only 4% of patients came from rich socioeconomic class. Of the 100 recruited cases majority 72% were from rural areas and 28% were from urban areas. Yellowness of eyes was the most common presenting feature being present in 40% of the patients followed by abdominal distension (36%) and black stools (34%). Disturbed consciousness ranging from disorientation to coma was present in 33% of patients. Other presenting complaints with their frequency are depicted in (**Table-2**). Common physical findings included splenomegaly, which was present in 80% of patients and ascites in 74% of patients. Other physical findings serological marker results and liver function tests are listed in (**Table-4**).

Following important aspects of the results were observed:

1. It was found that most of the patients (92%) presented to hospital when their liver disease was far advanced (46 patients belonged to Child grade B and 46 patients belonged to Child grade C).
2. Only 8 patients presented while their liver disease was mild (Child Grade A).
3. It was found that frequency of cirrhosis was almost equal in both sexes but female had more severe disease at the time of presentation (P=0.0346).
4. Rural Population had more severe disease at the time of presentation as compared to urban population.
5. Poor & middle socioeconomic group had more severe and advanced chronic liver disease as compared to rich class (p=0.036).
6. As the age increases, the frequency of cirrhosis increases.

### Discussion

Chronic liver disease due to HBV and HCV infection is a major health problem in Pakistan and other Third World countries. Patients of cirrhosis are admitted to the hospital with variable severity of disease. It is important to assess the severity of the disease and to predict the outcome for patients with cirrhosis. The Child-Pugh classification is a simple, convenient prognostic measure in patients with liver cirrhosis and we investigated its role in the assessment of the severity of disease.



**Fig. 1:** Age and sex distribution of patients with cirrhosis (n=100).

Majority of patients (78%) in this study were in age group 41-60 years. A study conducted by Umar et al<sup>10</sup> also showed that majority of patients (54%) were in age group 30-50 years. This indicates increasing incidence of cirrhosis with increasing age, probably due to greater exposure to risk factors.

Cirrhosis equally affects both sexes; this factor is highlighted by nearly equal frequency of cirrhosis in the current study (48% males, 52% females). This data is comparable with results of another study conducted by Durrani<sup>11</sup> in which frequency of cirrhosis was noted to be 52% in males and 48% in females. This indicates that males and females are exposed to nearly same risk factors. This is in contrast to other study by Siddiqui,<sup>12</sup> in which male predominance (67%) was reported.

**Table 2:** Clinical features of patients of cirrhosis at presentation (n=100)

| Symptoms              | No of patients | Symptoms        | No of patients |
|-----------------------|----------------|-----------------|----------------|
| Yellowness of eyes    | 40             | Fits            | 05             |
| Abdominal distension  | 36             | Loose motions   | 02             |
| Black stools          | 34             | Shrunken Liver  | 88             |
| Disorientation        | 33             | Enlarged liver  | 12             |
| Blood in vomitus      | 32             | Spleen          | 80             |
| Fatigue or malaise    | 28             | Anaemia         | 80             |
| Epigastric pain       | 18             | Ascites         | 74             |
| Constipation          | 15             | Jaundice        | 45             |
| Fever                 | 12             | Encephalopathy  | 37             |
| Aches & pains         | 10             | Palmar erythema | 25             |
| Spider telangiectasia | 20             |                 |                |

**Table 3:** Epidemiological characteristics of the patients presented in different Child Grades (n=100)

| Variable                     | Child grade A<br>(n=8) | Child grade B<br>(n=46) | Child grade C<br>(n=46) |
|------------------------------|------------------------|-------------------------|-------------------------|
| <b>Sex</b>                   |                        |                         |                         |
| Male                         | 04                     | 28                      | 16                      |
| Female                       | 04                     | 18                      | 30                      |
| <b>Age</b>                   |                        |                         |                         |
| <30                          | 02                     | 06                      | 02                      |
| 31-50                        | 04                     | 18                      | 22                      |
| >50                          | 02                     | 22                      | 22                      |
| <b>Socioeconomic status*</b> |                        |                         |                         |
| <3000                        | 02                     | 26                      | 14                      |
| 3001-7000                    | 06                     | 18                      | 30                      |
| >7000                        | 00                     | 02                      | 02                      |
| <b>Geographic status</b>     |                        |                         |                         |
| Rural                        | 08                     | 34                      | 30                      |
| Urban                        | 00                     | 12                      | 16                      |

\*Federal bureau of statistics Multan (based on monthly income).

**Table 4:** Biochemical & clinical features of the patients presented in different Child Grades.

| Variables                        |         | Child grade A<br>(n=8) | Child grade B<br>(n=46) | Child grade C<br>(n=46) |
|----------------------------------|---------|------------------------|-------------------------|-------------------------|
| <b>Encephalopathy</b>            |         | 1 (12%)                | 06 (13%)                | 30 (65%)                |
| <b>Ascites</b>                   |         | 4 (50%)                | 28 (60%)                | 42 (91%)                |
| <b>Serology</b>                  |         |                        |                         |                         |
| HbsAg +                          |         | 2 (25%)                | 22 (48%)                | 16 (35%)                |
| Anti HCV +                       |         | 0                      | 16 (35%)                | 22 (48%)                |
| Positive for Both                |         | 2 (25%)                | 4 (9%)                  | 2 (4%)                  |
| Negative for Both                |         | 4 (50%)                | 4 (9%)                  | 6 (13%)                 |
| <b>S. Bilirubin</b>              | 1-2     | 6 (75%)                | 30 (66%)                | 16 (35%)                |
| (mg/100ml)                       | 2.1-3   | 0                      | 8 (17%)                 | 10 (22%)                |
| > 3                              | 2 (25%) | 8 (17%)                | 20 (43%)                |                         |
| <b>S. Albumin</b>                | > 3.5   | 6 (75%)                | 6 (13%)                 | 2 (4%)                  |
| (gm/100ml)                       | 2.8 3.5 | 2 (25%)                | 36 (78%)                | 18 (39%)                |
| < 2.8                            |         | 0                      | 4 (9%)                  | 26 (57%)                |
| <b>Prothrombin time</b>          | 1-4     | 8 (100%)               | 26 (57%)                | 8 (17%)                 |
| sec. prolonged                   | 4.1-6   | 0                      | 14 (30%)                | 6 (13%)                 |
| > 6                              |         | 0                      | 6 (13%)                 | 32 (70%)                |
| <b>Portal Vein Diameter (cm)</b> | <1.5    | 0                      | 28 (61%)                | 22 (48%)                |
| >1.5                             |         | 8 (100)                | 18 (39%)                | 24 (52%)                |

Socioeconomic status has a major impact on the prevalence and severity of cirrhosis. It was observed in the present study that cirrhosis was more common in low-middle socio economic group as compared to rich class ( $p=0.036$ ). 96% of cirrhotic patients belonged to low-middle socio economic group while only 4% of cirrhotics were placed in high socio economic class. Moreover, it was also observed in the study, that disease is more severe and advanced in the people belonging to poor & middle socioeconomic class. This might reflect the fact that people of low socio economic group are admitted to tertiary care units when disease is far advanced and prognosis is poor. In a study of social epidemiology of chronic liver disease and cirrhosis by Singh and Hoyent<sup>13</sup>, it was shown that there were significant mortality differentials which depended upon socioeconomic status, age, race and ethnicity.

In this study majority (72%) of patients were from rural areas. This is in contrast to a study by Umer et al, carried in Rawalpindi in 600 patients of chronic liver disease in which 79% of patients belonged to urban areas. This contrast is probably due to more rural population in the catchment area of Nishtar Hospital Multan.

Our results show that most of cirrhotic patients presented to hospital while their liver disease was well advanced. In our series 92% patients presented in Child grade B and C, while only 8% were admitted with grade A. Other studies conducted in this region also showed that cirrhotic patients usually presented to hospital in late stages.<sup>14,15</sup> However two other studies had shown different results. In a series of patients studied by Sherlock,<sup>6</sup> it was shown that 35% of patients presented in Child grade A, 36% in Child grade B and 29% in Child grade C. Similar results have been reflected in another study conducted by Siddiqui<sup>12</sup> in Karachi in which he found that 45% patients presented in Child grade A, 40% in Child grade B and only 15% in Child grade C. This high frequency of Child grade A in these studies is probably due to more literacy rate, availability of better health facilities and better community awareness about the disease and risk factors.

In this study hepatitis B surface antigen was the most common serological marker comprising 40% cases alone and in addition 8% along with HCV. This incidence is slightly higher than the other studies.<sup>16-18</sup> Seroprevalence in the study confirmed that dual infection with HBV and HCV is not uncommon in Asia<sup>19</sup> and Western countries.<sup>20</sup>

Among different probable modes of transmission the use of contaminated syringes was

present in 80% of patients, history of shaving with used blades in 100% male cases while ear/nose piercing in 90% of female patients. One study conducted in Taiwan<sup>21</sup> revealed the use of syringes in 43.5% cases. The high frequency in our population is probably due to low literacy rate and ignorance of people about the grave consequences of hepatitis and cirrhosis. So early and effective measures for prevention of viral transmission may be very valuable in minimizing the gravity of this public health problem.<sup>22,23</sup>

Child's grading is useful guide for prediction of prognosis<sup>6</sup> of cirrhotic patients. One year survival in Child grade A and B is about 70% while in Child grade C it is 30%. Child grade is also used to decide a suitable time for patient's referral for liver transplantation. Patients in Child grade A are too early to refer and they should be carefully followed as prolonged survival is expected. Patients in Child grade B are suitable candidates for referral as good results are expected. In Child grade C patients transplantation is high risk procedure and likelihood of survival is reduced. In this study 46% patients could have been referred for liver transplantation and 46% patients of Child grade C were at high risk for transplantation. But in this study population most of the patients belonged to low socioeconomic group so liver transplantation was out of question.

## Conclusion

Results of this study indicated that cases of cirrhosis of liver are admitted to tertiary care units in this part of the world when their disease is far advanced with grave consequences. Moreover there is a significant association between geographic and socioeconomic status of the patients and severity of cirrhosis.

Frequency of cirrhosis is almost equal in both sexes, while there is an increasing frequency of cirrhosis with increasing age of the patients. As the use of infected disposable syringes, razors, and ear/nose piercing is the most common cause of spread of hepatitis virus, measures should be taken for limiting the spread of hepatitis virus by starting educational programme at mass media. Health care workers may be given the task of educating people about the mode of spread of hepatitis, explaining deadly consequences of chronic hepatitis and motivating them for vaccination. Moreover health personnel in the rural areas should be properly trained for early recognition and referral of the patients of chronic liver disease to tertiary care units, where medical and surgical measures can be instituted. This will prevent complications



and will help to decrease the morbidity and mortality. This will also help to decrease a big financial cost that

cirrhosis inflicts on our poor population.

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