USEFULNESS OF CTP SCORE AND MELD SCORE

IN LISTING PATIENTS FOR LIVER TRANSPLANTATION

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CERTIFICATE

This is to certify that the dissertation entitled **"USEFULNESS OF CTP SCORE AND MELD SCORE IN LISTING PATIENTS FOR LIVER TRANSPLANTATION"** is the bonafide original work of **Dr. R. MURALI** in partial fulfillment of the requirements for **D.M (GASTROENTEROLOGY) BRANCH – IV** Examination of the Tamilnadu Dr. M.G.R. Medical University to be held in August 2010. The period of study was between January 2008 and December 2009.

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DECLARATION

I, **Dr.R.MURALI,** solemnly declare that the dissertation titled, **"USEFULNESS OF CTP SCORE AND MELD SCORE IN LISTING PATIENTS FOR LIVER TRANSPLANTATION"** is a bonafide work done by me at Govt.Stanley Medical College & Hospital during 2007-2010 under the guidance and supervision of **Dr.V.JAYANTHI, M.D.,D.M.,** Professor and Head, Department of Medical Gastroenterology, Stanley Medical College, Chennai-600 001.

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INTRODUCTION

Liver transplantation is the only definite treatment modality for patients with end-stage liver cirrhosis. A major function of the predictive model is to accurately assess the probability of mortality within a given time interval, so that a timely liver transplantation can be performed.

The Child score, which was first proposed in the 1960s and then modified as the Child-Turcotte-Pugh (CTP) score. The selection of predictors and construction of the CTP system were empirical, and the system contains parameters that were felt very important to affect the outcome.

Although never formally validated as a prognostic tool, the CTP score is useful to assess the relative risk of mortality in patients with cirrhosis and has been popular for the past 3 decades. However, a major defect of the CTP system is a relatively narrow score range from 5 to 15. While the waiting list of liver transplantation is rapidly growing and patients on the waiting list far out number the cadaveric liver donors, the priority of patients with the same CTP score awaiting transplantation becomes difficult to judge.

A simple first-come, first-served principle was proposed and used in the transplantation society [1]. However, investigators subsequently found that patients with a longer waiting time may actually have a less severe degree of cirrhosis. It was later demonstrated that waiting time is not a factor that

affects survival and was abandoned as a criterion in organ allocation. Another potential inherent flaw of the CTP system is that it contains subjective variables, including the severity of encephalopathy and ascites, which may be greatly influenced by personal judgment from center to center during status interpretation. These drawbacks compromise the fairness of organ allocation in liver transplantation.

The concept of a model for end-stage liver disease (MELD), initiated by the Mayo Clinic group in 2000[2], emerged and was aimed to amend these defects. The MELD was originally created for the prediction of mortality after Transjugular Intrahepatic Porto systemic Shunt [3]. On the basis of simple, readily available, and reproductive variables [serum creatinine, bilirubin, international normalized ratio (INR), and initially etiology], the MELD allows the identification of patients with end-stage liver disease and a median survival as short as 3 months.[3] Because of the objective nature of its components and its ability to identify increasing death risk, this score was adopted by the United Network for Organ Sharing (UNOS) in place of the CTP score for the allocation of livers from deceased donors [4]. If the MELD represents determinant progress in terms of methodology and validation, its accuracy for the prediction of outcome in cirrhotic patients is also not always superior–and may even be inferior–to the one of CTP score[5][6].

Hence, this study is to evaluate the superiority of CTP vs. MELD score in prediction of outcome in patients with End stage Liver disease, who are listed for liver transplantation.

AIM

The main aim of this prospective study was to compare the accuracy of the Child-Pugh score and the MELD score for the prediction of 3 month and 6 month survival in cirrhotic patients waiting for liver transplantation.

REVIEW OF LITERATURE

Thomas Starzl carried out the first human liver transplant in 1963 in Denver. Initially the outcomes were very poor; however the persistence of Starzl and his team was rewarded and in 1968, Calne set up the second transplant program in Cambridge.

Patients were usually very sick at the time of transplant and few survived the post-operative care. Over the next two decades, the numbers of patients grafted gradually increased and survival rates improved. There is no one reason for this improvement, but better selection, improved anaesthetic and surgical techniques, the use of powerful and specific anti-microbial and immunosuppressive agents all made significant contributions. In the 1980s, new programs developed primarily in North America and in Europe. Now liver transplantation has become a routine procedure for patients with end-stage liver disease.

The decision to consider liver transplantation is based on:

1. An assessment of the severity of liver failure.
2. The prognosis for the patient in response to current medical/surgical therapy
3. The quality of the patient's life (as a consequence of the liver disease)
4. The judgment on the potential for liver transplantation to restore the

patient's health.

The determination of suitability is independent of the underlying diagnosis, and for that reason the conditions for which liver transplantation may be an appropriate therapy constitute a list of almost all liver diseases.

The Donor Organ Shortage

The source for donor livers in the western world is almost exclusively from heart beating brain dead donors. Sophisticated schemes are required to identify potential donors, retrieve their organs and transport the organs to the location of the potential recipient. At the same time, the number of potential recipients awaiting liver transplant continues to grow at a furious pace, outstripping the modest increases in donor numbers. This has meant that there are many more recipients for every donor liver. Thus in the United States in 2000, there were over 17000 patients on the waiting list, only 4579 cadaveric transplants done and 371 living related transplants. There were 1347 deaths on the waiting list [7]. The disparity between donor availability and recipient number has led to growing numbers of patients on the waiting list for liver transplant.

Innovative responses to the donor shortage have been introduced but while these approaches may help relieve the situation, they are unlikely to ease the effects of the organ shortage.

1. **Non-heart beating donors**. Non-heart beating donors are uncommon, and the frequency of primary graft non-function and later, biliary strictures are greater in these allografts.

2. **Split livers**—the division of a cadaveric organ between two recipients. However, only some cadaveric donor livers are suitable for splitting.

3. **Living donation**—the harvesting of liver segments from living donors. Many recipients lack a family member or friend who is suitable or willing for living donation. Moreover, living segmental liver transplantation poses real risks of morbidity and even mortality (1% or more) for the donor.

4. **Use of marginal donors and extended use donor organs**

Marginal donors: some donor livers are associated with a higher probability of primary non-function (the so-called marginal donor). Marginal organs include those from older or obese donors, or donors who are unstable prior to organ retrieval. Other marginal grafts include steatotic livers, in which histology demonstrates greater than 25% microvesicular or macrovesicular fat. These grafts are associated with a higher incidence of primary non-function of the allograft.

Extended use organs from patients infected with present or past viral hepatitis B or C and those with extrahepatic malignancy or treated bacterial infection. Organs from virus-infected donors are matched to a recipient

already infected by the same virus, albeit only after the recipient is apprised and has given consent. An example would be putting an anti-hepatitis C positive liver into an antihepatitis C positive recipient, or an anti-HBcore positive liver into an HBsAg positive recipient.

5. **Xenotransplants**: the use of genetically modified animals, such as pigs or primates, is still a very long way from clinical use. While some of the problems of hyperacute rejection may be overcome, problems, such as chronic rejection, freedom from introducing infection (such as the porcine endogenous retrovirus (PERVs) as well as physiological concerns make it unlikely that this approach will provide a solution to the organ shortage in the next decade.

6. Increasing organ donation: There are wide variations in the rates of organ donation—between 8 and 37 donors per million. Attempts to increase organ donation by education have largely failed: the most successful model in Spain is dependent on provision of a well-organized system of donor co-ordinators and acceptance cell transplantation and hepatocyte transplantation. Thus, it is unlikely that these methods will meet the needs of all potential recipients.

Selection for Liver Transplantation

Evaluation of candidates for liver transplantation can be reduced to three core questions:

- What is the severity and prognosis of the patient's liver disease?
- Are there confounding medical, surgical or psychological factors which would reduce the expectation of a liver transplantation?
- What are the wishes of the patient in regards to liver transplantation?

These questions are best addressed in a multidisciplinary process. The evaluation may be carried out in an outpatient setting.

The prospective candidate is assessed by transplant surgeons and physicians, social workers, and selected subspecialists including psychiatrists, cardiologists, pulmonologists and nephrologists. Previous investigations including radiographs and biopsies are retrieved and new investigations are ordered where necessary. When the information gathering segment of the evaluation is complete, the patient is presented to the transplantation evaluation committee and a decision is made regarding placement on the transplant waiting list.

Liver transplant programs must inform and educate prospective recipients and their families of the risks and benefits of liver transplantation. It is important to provide the patient with the opportunity to withdraw from transplant assessment if they do not wish to proceed. Conversely, whenever the transplant program determines that the patient is not a suitable candidate; the program should facilitate the patient in receiving a second opinion regarding their suitability, if they should so wish.

Indications for consideration of liver transplantation in patients with chronic liver disease

Recurrent gastroesophageal variceal hemorrhage

Refractory ascites

Spontaneous bacterial peritonitis

Severe hepatic encephalopathy

Hepatorenal syndrome

Hepatopulmonary syndrome

Hepatocellular carcinoma

Severe coagulopathy due to liver failure

Absolute contraindications

Severe (uncontrolled) infection outside the hepatobiliary system

Metastatic cancer (except some neuroendocrine cancers)

Extra hepatic cancer (other than local skin cancer)

Cholangiocarcinoma

Advanced cardiopulmonary disease

AIDS

Severe pulmonary hypertension

Technical considerations (e.g., widespread intra-abdominal venous thrombosis)

Relative contraindications

Recent drug or alcohol abuse

Age >70 years

HIV infection, without AIDS

Inability to be compliant with immunosuppression protocol and/or participate in routine post-transplant medical follow-up

Advanced chronic renal disease

Moderate pulmonary hypertension.

Allocation and Distribution of Donor Livers

Different countries have adopted different approaches to allocation of cadaveric donors of solid organs for transplantation:

US: In the US, there is no Federal limitation on the number of transplant centers. Patients are centrally listed and available organs allocated to the individual recipient. At present allocation gives priority to the sickest patient. The greatest priority is given to patients with fulminant hepatic failure or primary allograft non-function, and for certain pediatric indications. For all other candidates, priority is determined by the MELD or PELD (the pediatric scoring system) score. An adjustment has been made for patients with hepatocellular cancer.

UK: The number of centers designated for NHS (public funded) treatment is controlled by central government. The six transplant units have areas (according to their contracted activity) and any organ offered in their area can be used for a listed patient. Supra-urgent patients (those with fulminant hepatic failure) will have national priority. The individual unit determine which recipient should receive donor organs offered to that area. The units have agreed indications and contra-indications to ensure equity and justice. (See www.uktransplant.org.uk)

Europe: European countries have adopted a range of approaches to organ retrieval, allocation and distribution.

Timing of Placement on the Waiting List

A useful approach to the often difficult questions regarding timing of placement of a patient with liver disease on the transplant waiting list is to consider compensated (or stable) and decompensated cirrhosis.

Stable Cirrhosis: is defined as cirrhosis in a patient who has never experienced any one of the four cardinal features of decompensation: variceal hemorrhage, accumulation of ascites, jaundice associated with cirrhosis, or encephalopathy.

Decompensated cirrhosis: cirrhosis and the onset of at least one of these clinical phenomena is defined as decompensated cirrhosis. The onset of decompensation is associated with significantly impaired survival and indicates the need to evaluate for liver transplantation. Spontaneous bacterial peritonitis and or hepatorenal failure are indicators of significantly worsened prognosis, and should prompt transplantation evaluation.

Indications for evaluation of liver transplantation are listed above. Paradoxically, some of these indications may, when severe, become contraindications to transplantation.

Assessment of Severity and Prognosis of Chronic Liver Disease

The severity of liver failure in patients with chronic liver disease can be assessed by several models although the two models currently used are the Child-Pugh classification and the MELD score.

Child-Turcotte-Pugh Class

In the Child Pugh classification scoring is done based on the following parameters listed in the table.

Child-Turcotte-Pugh classification

Variable	1	2	3
Encephalopathy	None	Grade I or II	Grade III or IV
Ascites	None	Mild	Moderate
Bilirubin (mg/dl)	<2	2-3	>3
Albumin (g/dl)	>3.5	2.8-3.5	<2.8
Prothrombin time Prolongation in seconds INR	<4 <1.7	4-6 1.7-2.3	>6 >2.3

Scores are summed to determine Child's class: A=5-6, B = 7-9 & C=10-15.

The initial version of Child or Child–Turcotte score [8], included two continuous variables (bilirubin and albumin) and three discrete (quantitative)

variables (ascites, encephalopathy and nutritional status). Again, the selection of these five variables as well as the cut-off values for bilirubin and albumin are empirical. The five variables and their respective cut-off values were arranged so as to define three distinct groups of increasing severity (A, B and C). Patients whose individual values fall into different groups could not be categorized. Therefore, variables have been ascribed 1, 2 and 3 points according to whether their values fell within the limits of groups A, B and C, respectively. The score is the sum of these points, ranging from 5 to 15. It is generally (but not universally) accepted that patients with a score between 5 and 8 belong to group A, patients with a score between 9 and 11 belong to group B and patients with a score between 12 and 15 belong to group C.

A modified version, termed Child–Pugh score, has been proposed almost 10 years later [9] , In this modified version, nutritional status is replaced by Prothrombin time. A difficulty comes from the fact that, across different countries, prothrombin has been expressed either as a time value (prothrombin time in seconds) or as a percentage of the activity of normal plasma (Prothrombin index or ratio). It can be estimated that the original cut-off values of 4 and 6 seconds for prothrombin time correspond to a ratio of approximately 50% and 40% of normal, respectively. The lowest cut-off value for albumin has been changed from 30 to 28 g/l. The score,

corresponding to the sum of individual points, allows to categorize patients in Child– Pugh grades A (5–6 points), B (7–9 points) and C (10–15 points). Importantly, the total range of points (5–15) is not equally distributed across grades A, B and C, probably in an attempt to mirror more efficiently the clinical impact of the each grade in terms of prognosis.

The variables included in Child–Pugh score are often considered as reflecting the synthetic (albumin and prothrombin) and elimination (bilirubin) functions of the liver. However, this concept may be viewed as an oversimplification. Indeed, albumin is influenced not only by hepatic synthetic function but also by transvascular escape or clearance, favoured by sepsis [10] and ascites [11]. Similarly, bilirubin is increased in case of renal insufficiency, hemolysis, and sepsis [12], all of which are not uncommon in patients with cirrhosis. Decreased prothrombin index may be related to the activation of coagulation, the major cause of which is sepsis [13]. Metabolic encephalopathy can be precipitated by sepsis or renal insufficiency [14]. As a result, albumin, bilirubin, prothrombin and encephalopathy represent prognostic markers coming from a broader source than the pure assessment of liver 'functions'. Thus, Child–Pugh score may be viewed as a multiorgan assessment in patients with underlying cirrhosis rather than a simple estimate of liver functions.

Child score and subsequently, Child–Pugh score were initially proposed in the limited setting of the evaluation of surgery for portal hypertension (portacaval shunting and transection of the oesophagus) [9]. However, its prognostic value has been demonstrated in many other situations involving cirrhosis over the last 30 years. In particular, multivariate analyses using Child–Pugh score as an entity have shown that it has an independent prognostic value in the settings of ascites[15],ruptured oesophageal varices [16] subclinicalencephalopathy[17],hepatocellular carcinoma [18],liver surgery [19], alcoholic cirrhosis [20], decompensated HCV-related cirrhosis [21], primary sclerosing cholangitis [22], primary biliary cirrhosis [23] and Budd–Chiari syndrome [24]. Interestingly, the prognostic information provided by the addition of different markers of liver metabolism (such as the elimination of galactose, ICG, aminopyrine, or lidocaine) to the variables of Child–Pugh score is limited [25–28]. Similarly, the addition of usual anthropometric markers of nutritional status does not seem to add much to the predictive value of Child–Pugh score [29]. This finding is in contrast with the initial assumption made in Child– Turcotte score which, in contrast to Child–Pugh, included nutritional status [8].

The main application of Child–Pugh score has been to stratify or to select patients for prognostic analyses, for retrospective assessment of non-

randomly administered therapy, or for randomized clinical trials. Contrasting with its wide validation as a prognostic index, Child–Pugh score is seldom incorporated into algorithms for the management of individual patients, with the exception of patient selection for surgical resection of hepatocellular carcinoma [30] or for extrahepatic surgery [31]. However, at the bedside, Child– Pugh score is widely used as a simple descriptive or prognostic indicator and is frequently associated to other indicators.

A first limitation is related to the fact that the five basic components of Child–Pugh score have been selected empirically. It can be argued that studies reported thereafter, have shown that these variables do have a statistically significant impact on the outcome [32, 33–37]. However, not all variables have an independent influence. It can be anticipated, for instance, that albumin and coagulation factors, both synthesized by the liver, are strongly correlated to each other. Including these two variables in a single score might result in overweighting their influence. Only multivariate analysis allows selecting variables, which do not fully interfere with each other.

A second limitation comes from the arbitrary use of cut-off values for the quantitative variables. Neither there is evidence that these cut-off values are optimal for defining significant changes in mortality risk, nor there is

evidence that mortality risk increases linearly across Child's grades A, B and C. For example, a patient with a bilirubin level of 3 mg/dl will be categorized in the same bilirubin class (class C) that a patient with a bilirubin level of 30 mg/dl. This represents a 'ceiling effect' on quantitative variables which does not exist with continuous scores derived from regression models.

And further limitations are due to the fact that important prognostic factors are not taken into account. In particular, a number of studies have emphasized the determinant influence of renal function in the course of cirrhosis [15, 33, 35, 36]. For instance, the weight of creatinine is more than twice as high as that of bilirubin in MELD score [36].

Other studies have shown that markers of portal hypertension including oesophageal varices [38], portal blood velocity [39] and hepatic venous pressure gradient [26] provide additional prognostic information when added to the variables of Child–Pugh score.

Lastly, Child–Pugh score does not take into account the cause of cirrhosis, the possible coexistence of several causal factors, and the persistence of a damaging process such as persistent alcohol abuse, ongoing HBV or HCV replication, or inflammatory activity of autoimmune hepatitis [34, 40].

In previously reported studies, the variation in survival explained by Child–Pugh score remains low (less than 50%), as it is the case with most survival models [41] emphasizing the fact that other factors play an important role in prognosis.

MELD Score

The complex issues of optimal indications for transplantation and prioritization for the allocation of liver grafts have been the main incentives to the development and widespread diffusion of MELD score. However, it must be noted that MELD score has been originally created with the aim of predicting survival after Transjugular intrahepatic portosystemic shunt (TIPS)[36], a context that may differ from that of candidates for transplantation. On the basis of multivariate analysis using Cox model, the authors found

that, among a list of predetermined variables, four objective variables had a significant and independent impact on survival; namely bilirubin, creatinine, INR and the cause of cirrhosis (alcoholic and cholestatic versus other causes).

Logarithmic transformation of quantitative values has been used in order to lessen the influence of extreme values in statistical analysis. A regression

coefficient has been attributed to each prognostic variable as a reflect of their proper weight on mortality. For a given patient, the final risk score (the ancestor of the current MELD score), derived from a survival function, is as follows: R=0.957 loge (creatinine [mg/dl]) + 0.378 loge (bilirubin [mg/dl]) + 1.120 loge (INR) + 0.643 (cause of cirrhosis). 'Cause of cirrhosis' is quoted 0 if alcoholic or cholestatic and 1 for all other causes. Unfortunately, this score does not allow a direct estimation of the probability of survival at a given time for one patient with given values of creatinine, bilirubin and INR. Estimating the probability of survival needs further computation based on the survival function of the model. A pocket chart that can be used for estimating life expectancy with individual values has been proposed.

Unfortunately, the normogram is not really friendly for use at the bedside. In the same series, Child–Pugh score, although significantly correlated with a poor outcome on univariate analysis, could not accurately predict survival on multivariate analysis. Interestingly, Child–Pugh score was particularly inaccurate in the subgroup of patients of grade B with renal impairment, highlighting the key importance of renal function in cirrhosis.

For years, the allocation of liver grafts had been based on waiting time. However, important studies clearly showed that waiting time is not an appropriate marker of the risk of death on the waiting list, warranting other

criteria for more efficient and fair organ placement [42]. Again, attention skipped from TIPS to transplantation. In a subsequent study [2], a slightly modified score, termed MELD, was tested in different populations of cirrhotic patients. For ease of use, the score was multiplied by 10 and rounded, giving the following formula: MELD score = 9.6 loge (creatinine mg/dl) +3.8 loge (bilirubin mg/dl) + 11.2 loge (INR) + 6.4 (cause of cirrhosis [0 if cholestatic or alcoholic, 1 otherwise]). This study showed that MELD score adequately predicts mortality in hospitalized as well as ambulatory cirrhotic patients, that the model is generalizable to patients with various causes and severity of cirrhosis, that MELD score is a useful scale for assessing On the grounds of these results, MELD score was finally adopted in the United States in 2002 as the reference scoring system to rank patients for liver transplantation. Practically, two additional modifications have been performed so far. Firstly, the variable referring to the cause of cirrhosis (cholestatic or alcoholic versus other causes) has been abandoned and replaced by a constant value. As a result the current score is as follows: 9.6 loge (creatinine mg/dl) + 3.8 loge (bilirubin mg/dl) + 11.2 loge (INR)+ 6.4.

Secondly, candidates with HCC are listed with a MELD score equivalent to a 10% (24 points) or 15% (29 points) risk of death within 3 months

according to which the tumor is classified as stage I or II. Stage I corresponds to a single nodule less than 2 cm. Stage II corresponds to a single nodule between 2 and 5 cm, or 2 or 3 nodules each less than 3 cm. By February 2003, these additional MELD points have been lessened to 20 and 24, respectively, because it was felt that patients with HCC had over-prioritization. Nonetheless, these patients if not transplanted within 3 months, receive additional MELD points equivalent to a 10% increase in pre-transplant mortality every 3 months until they are transplanted or determined to be unsuitable for transplantation, because of excessive tumor progression. This latter change has been done because a significant proportion of patients with HCC have a compensated cirrhosis and low MELD score. Although they are good candidates for transplantation, they would be unlikely to be transplanted, unless receiving 'extra' points

In contrast to Child–Pugh score, the variables of MELD score have been selected in a given population and the score has been validated thereafter in an independent sample [2, 36]. Recently, studies have been reported confirming that MELD is a robust risk score in patients undergoing TIPS, with c statistics for 1 year survival of about 0.70 [33,43]. Lastly, MELD score has been tested in the setting of acute liver failure and emergency

retransplantation for early graft failure. It has been suggested that MELD score is significantly correlated to mortality risk in patients with non-paracetamol-induced acute liver failure while, in contrast, there is no correlation between MELD score and mortality in those with paracetamol overdose or early graft failure [44]. Nonetheless, the use of MELD score in patients with acute liver failure, whether related or not to paracetamol, seems highly questionable since neurological status, a crucial prognostic index in this context, is not taken into account.

The application of MELD score for ranking candidates for transplantation gave the opportunity to assess prospectively its advantages over waiting time and UNOS status for prioritization in the US. By comparing data from two time periods, before and after MELD, a recent evaluation has shown that the application of MELD score for prioritization resulted in a 12% decrease in the total number of new candidates listed for transplantation [45]. Practically, less patients with low risk scores were listed to 'take place' on the list and take advantage of it in terms of waiting time. In addition, there was a 3.5% reduction in mortality on the waiting list (a difference which was not statistically significant as compared to pre-MELD period), a 10% increase in the total number of deceased donor transplantation (which is unlikely to

result solely from MELD score) and no significant change in post transplantation survival [45]. After additional points were ascribed to patients with small HCC, a significant decrease in the interval between listing and transplantation as well as a significant decrease in the rate of dropout from the waiting list due to tumor progression were observed [46]. However, a perverse effect of the system was that, in parallel, there was a threefold increase in the number of patients listed with a diagnosis of HCC. Importantly, there was also a significant increase in the proportion of patients who were found to have a misdiagnosis of HCC and no identifiable tumor on the explanted liver [47]. It is often difficult to ascertain the malignant nature of small nodules (<1 cm) within a cirrhotic liver, even with current imaging techniques [48]. The current allocation system obviously incites to categorize patients as having a small HCC, even when the malignancy is not clearly demonstrated.

In contrast to its ability to evaluate pre-transplant mortality risk in candidates for transplantation, pre-transplantation MELD score seems to be a poor predictor of post transplantation survival, except for extreme values (>35) [49–51]. Indeed, post-transplantation survival depends on many factors other than recipient's condition, most of which (in particular those related to the donor and technical issues) are unknown or elusive at the time of listing.

Limitations

MELD score shares with Child–Pugh score several limitations. First, the use of multivariate analysis to determine which variables will be included in the final score can be viewed as more reliable than empirical selection of variables. However, multivariate analysis is performed on the basis of variables, which initially were also selected empirically because they were felt to have a potential prognostic influence. Therefore, it cannot be excluded that some important variables have not been taken into account for analysis. It is worth noting that some of the most widely accepted prognostic scores, such as TNM (for Tumor Node Metastasis), Glasgow coma scale and APACHE score rely on predictive variables selected empirically and not statistically.

Second, variables included in MELD score, in contrast to encephalopathy and ascites, are theoretically objective and not influenced by subjective appreciation. However, in practice, creatinine and bilirubin can be altered by therapeutic interventions (diuretics in particular), sepsis or hemolysis. The choice of INR rather than other markers of coagulation including prothrombin time and Prothrombin index is a controversial issue. Another group found a very similar correlation [35] suggesting that INR can be reliably estimated from prothrombin ratio for retrospective purposes.

There are also some proper limitations to MELD score. While its principal application has been liver transplantation and allocation of donors, MELD score has been established among a population of candidates for TIPS. Although MELD proved to be a robust and efficient prognostic score in candidates for transplantation [6], it is possible that a score specifically tailored for liver transplantation could have been even more effective in this setting.

Another limitation comes from the absence of clear-cut discriminant values with MELD score. With time, hepatologists have been used to deal with the simple limits of Child–Pugh's class A, B and C. Such discriminant limits with MELD score have not yet been determined in a broad scope of situations. A prospective evaluation of MELD score in different situations (or for different therapeutic interventions) might lead to different cut-off values, rendering the decision process more complex than with the universal use of Child–Pugh classes.

The principal limitation of MELD score is the need for computation, limiting its usefulness at the bedside. MELD, derived from a study focussing on TIPS patients, has not been anticipated to be widely used. Logarithmic transformation of quantitative variables has been chosen to improve significance and fit in the statistical model. However, there is no clear

evidence that statistical refinements translate in an identifiable improvement in accuracy and reproducibility.

As an example, the cause of cirrhosis played a statistically significant and independent role in the original model. However, it seems that the accuracy did not change much when the cause of cirrhosis was eventually removed from the list of variables [2, 36]. Whether a simplified score using the same objective variables, but without the need for computation would give a similar accuracy is worth being tested.

MATERIALS AND METHODS

It was a prospective study between January 2008 and Dec 2009, where consecutive patients with cirrhosis attending the liver clinic of Government Stanley Medical College & Hospital were studied.

Inclusion criteria: Patients with an initial CTP score of 7 or more (equivalent to class B or C) to fulfill the minimal listing criteria for liver transplantation, were included.

The diagnosis of liver cirrhosis was based on the characteristic findings including physical stigmata of cirrhosis, decreased serum albumin, and increased serum globulin levels, computed tomography or ultrasonography findings of uneven liver surface, coarsened echogenicity of liver parenchyma, enlarged spleen and/or detection of ascites, and detection of esophageal varices by endoscopy. The presence and severity of ascites were detected and evaluated by computed tomography or ultrasonography. The definition of hepatic encephalopathy was according to the West Haven criteria.

The underlying etiology of liver disease was attributed to hepatitis B virus (HBV) infection if patients were seropositive for hepatitis B surface antigen (HBsAg, RIA kits, Abbott Laboratories, North Chicago, IL) and attributed to hepatitis C virus (HCV) infection if patients were seropositive for antibody against HCV by a second-generation enzyme immunoassay (Abbott Laboratories, IL) on at least two occasions.

The CTP scoring system is classified from A to C and calculated on the basis of serum bilirubin and albumin levels, the prothrombin time (PT), and the presence and severity of ascites and encephalopathy.[9] To obtain the MELD score for the patients, the Internet accessed at: www.unos.org or: www.mayo.edu/int-med/gi/model/mayomodl-5-unos.htm.

The study was approved by the institutional review board and all patients who participated in the study gave a written informed consent.

Statistical Analysis

Chi-squared test or Fisher's exact test (two-tailed) was used for categorical data. Spearman's correlation analysis was used to estimate the correlation between MELD and CTP system. To assess the ability of MELD and CTP

score in predicting the risk of death, this study was performed by measuring the concordance (c-statistic) equivalent to the area under the receiver operating characteristic (ROC) curve. Receiving-operating-characteristic (ROC) curve and the derived c statistic provide a global and standardized appreciation of the accuracy of a marker or a composite score for predicting an event. This statistic allows a simple comparison of the accuracy of different prognostic scores within the same population. ROC curve represents the plotting of sensitivity against 1-specificity. A c statistic of 0.5 means that discrimination is due to chance alone. A c statistic of 1 means that the score perfectly predicts outcome (a goal never achieved in clinical practice). Therefore, the accuracy of a score increases when c statistic moves from 0.5 to 1. Comparison of the area under ROC curves was done using the method of Hanley and McNeil. The outcome was assessed as 3-month and 6-month mortality. All statistical analyses were conducted using SPSS for Windows version 12 (SPSS, Inc., Chicago, IL) and MedCalc for Windows version 4.2 (MedCalc Software, Mariakerke, Belgium). For all tests, a *P* value less than 0.05 was considered statistically significant.

RESULTS

A total of two hundred and one patients were enrolled during the study period. Among them, 5 patients who underwent liver transplantation during the follow-up were excluded from analysis. The natural history and outcome were assessed for the remaining 196 cirrhotic patients who formed the basis of this study.

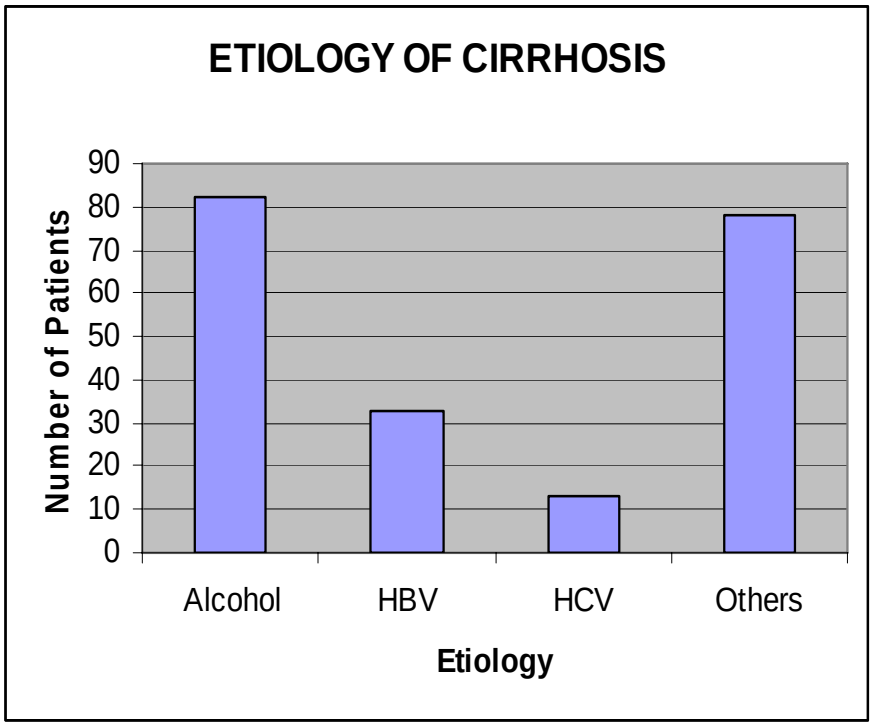
Clinical characteristics and demographic data of patients included in the study are shown in Table 1.The mean age of patients was 45.9 years (range 18 to 65 years).

Of the 196 patients, 150 were male and 46 were female. Patient who underwent transplantation during the observation period were excluded for this analysis. Forty patients died during the study period and 5 patients were successfully transplanted. The mean CTP score was 7.44 (range 7 to 12) and mean MELD score of all patients was 10.35 (range 6 to 41).

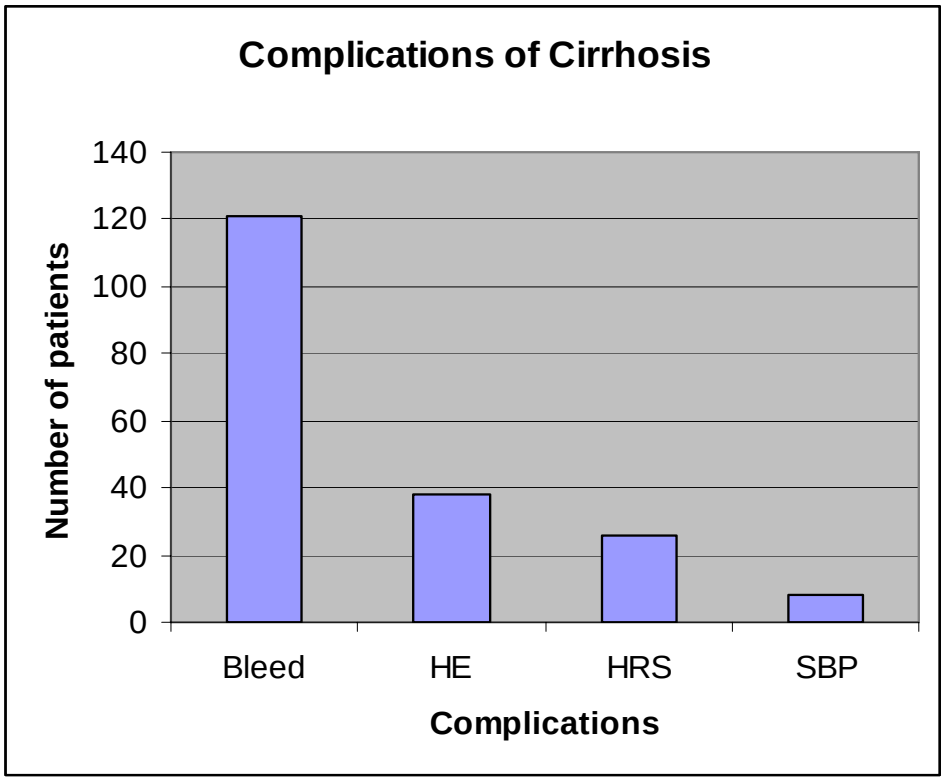
Of the 196 study patients, 16 (8.16%) and 40 (20.4%) patients died at 3- and 6-month respectively.

Table 1. Patient Characteristics and variables at the time of listing among Survivors and Non-survivors on waiting list.

	Total no of pts	**On waiting list**	**Died on waiting list**
Patients	196	156	40
Age (years)	45.9	45.8	46.1
Male /Female	150/46	113/43	37/3
Etiology of liver disease			
Cirrhosis-alcoholic	82	66	16
Cirrhosis- HBV	33	29	4
Cirrhosis- HCV	13	11	2
Others	78	60	18
Complications			
Bleed	121	99	22
HE	38	17	21
HRS	26	10	16
SBP	8	5	3



Of the 196 patients 41.8%of patients suffered from alcoholic liver disease and 23.4% from virus hepatitis-induced cirrhosis. Other etiologies accounted for 39.7%.



The Variceal Bleed represents a major complication constituting 61.7% and Hepatic Encephalopathy was noted in 19.3% of the study population

The presence of Hepatorenal syndrome (HRS) and Spontaneous Bacterial peritonitis (SBP) as complications of Liver cirrhosis were noted in 13.2% and 4% of patients respectively.

Table 2 : Follow up CTP scores are listed below

	Group				
	Waiting list		Died on list		Student independent
	Mean	SD	Mean	SD	t-test
CTP^0	7.40	.49	7.63	.77	t=1.72 p=0.09
CTP^3	7.39	.49	8.90	1.39	t=6.75 p=0.001
CTP^6	7.88	1.19	9.48	1.41	t=5.15 p=0.001

CTP^0 = CTP score done at baseline.

CTP^3 = CTP score done at 3^{rd} month.

CTP^6 = CTP score done at 6^{th} month.

The Mean CTP score at baseline, 3 months and 6 months was 7.4, 7.39 and 7.88 respectively for patients in the waiting list and 7.63, 8.9 and 9.48 respectively for patients who died on waiting.

Table 3: Follow up MELD scores are listed below

	Group				Student independent t-test
	On Waiting list		Died on list		
	Mean	SD	Mean	SD	
$MELD^0$	10.35	1.77	10.80	3.35	t=0.81 p=0.41
$MELD^3$	10.37	1.74	17.25	7.61	t=5.68 p=0.001
$MELD^6$	12.99	5.33	20.57	5.81	t=5.98 p=0.001

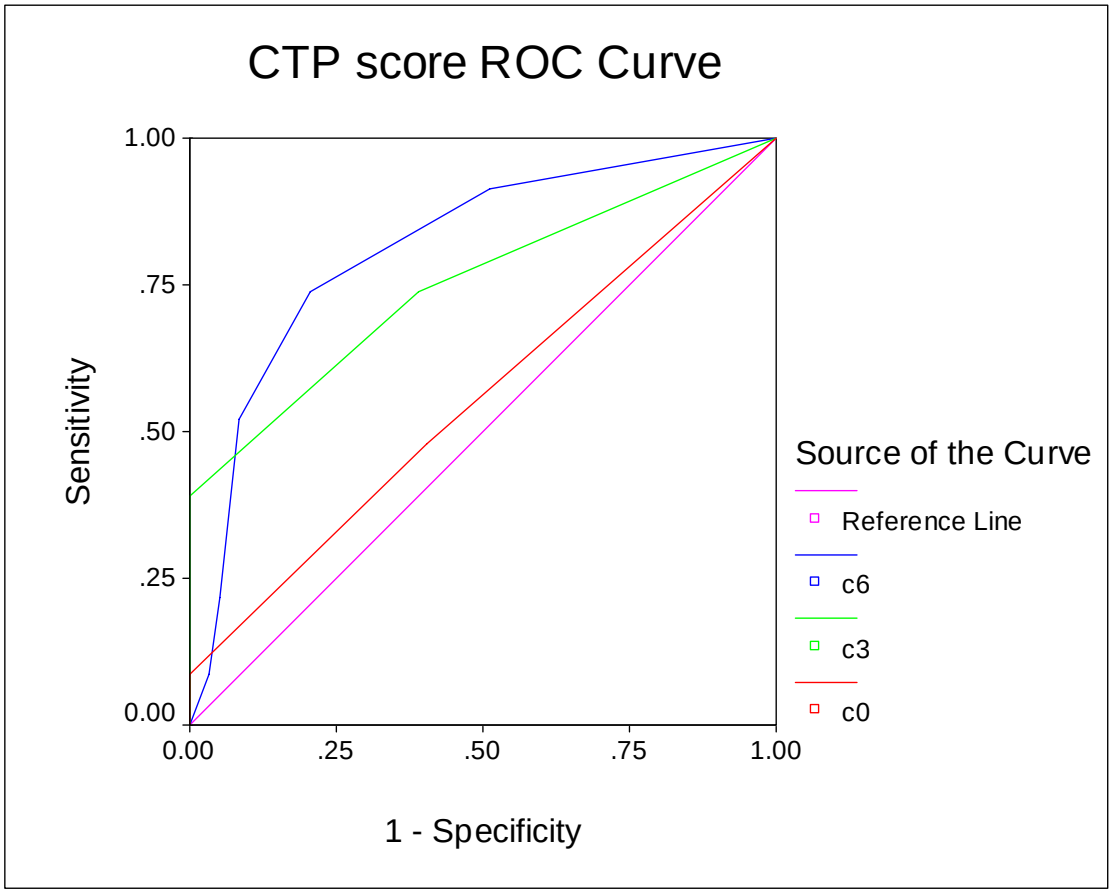
$MELD^0$ = MELD score done at baseline.

$MELD^3$ = MELD score done at 3^{rd} month.

$MELD^6$ = MELD score done at 6^{th} month.

The Mean MELD score at baseline, 3 months and 6 months was 10.35, 10.37 and 12.99 respectively for patients in the waiting list and 10.8, 17.25 and 20.57 respectively for patients who died on waiting.

Graph 1

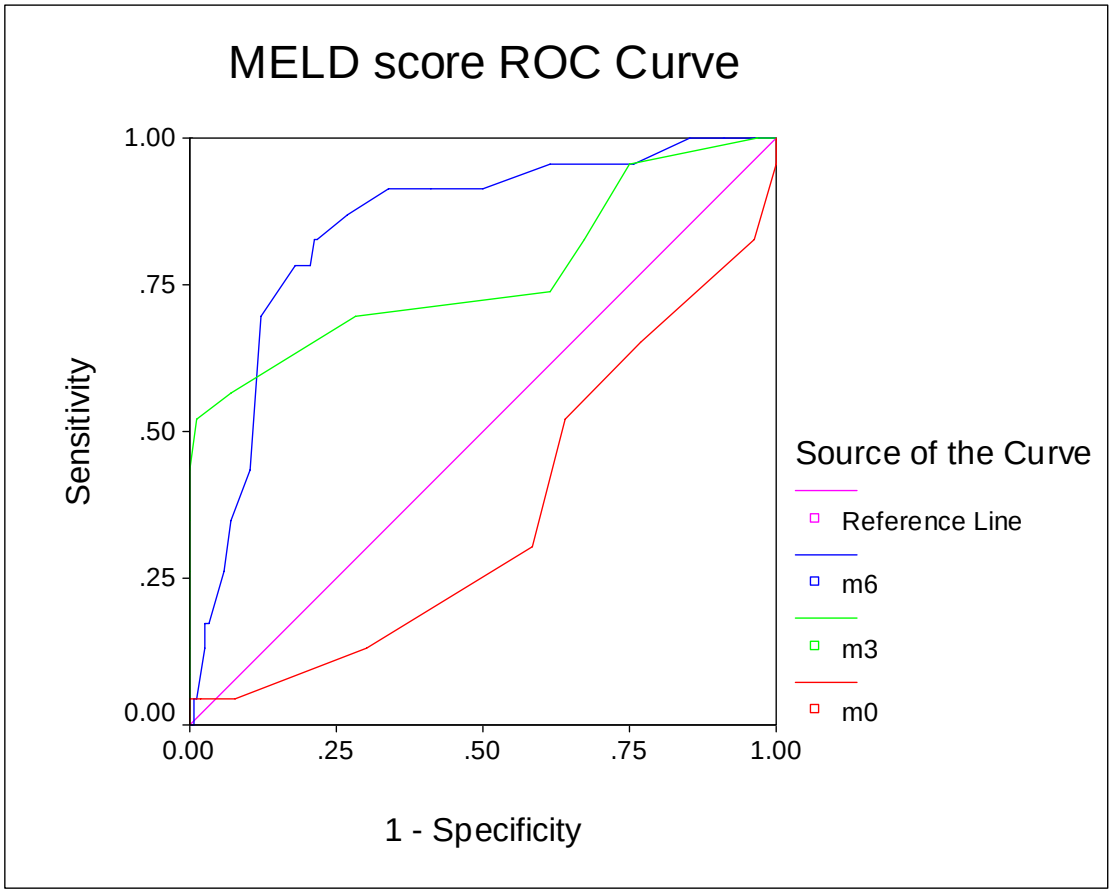


The ROC curve for CTP score at 3 months is 0.73 at CTP score 7.5 and also at 6 months at CTP value of 8.5 the C-STAT is 0.73 .

Table 4: Coordinates of the Curve for CTP score

Test results Variable(s)	Positive if Greater Than or Equal To(a)	Sensitivity	1 - Specificity
c0	6.00	1.000	1.000
	7.50	.478	.404
	8.50	.087	.000
	10.00	.000	.000
c3	6.00	1.000	1.000
	7.50	.739	.391
	8.50	.391	.000
	9.50	.043	.000
	11.00	.000	.000
c6	6.00	1.000	1.000
	7.50	.913	.513
	8.50	.739	.205
	9.50	.522	.083
	10.50	.217	.051
	11.50	.087	.032
	13.00	.000	.000

Graph 2



The ROC curve for MELD score at 3 months is 0.73 at MELD score 10.5 and also at 6 months MELD score value of 15.5 the C-STAT is 0.82 .

Table 5: Coordinates of the Curve for MELD score

Test Result Variable(s)	Positive if Greater Than or Equal To(a)	Sensitivity	1 - Specificity
m0	5.00	1.000	1.000
	6.50	.957	1.000
	7.50	.826	.962
	8.50	.652	.769
	9.50	.522	.641
	10.50	.304	.583
	11.50	.130	.301
	12.50	.043	.077
	13.50	.043	.019
	15.00	.043	.000
	17.00	.000	.000
m3	6.00	1.000	1.000
	7.50	1.000	.968
	8.50	.957	.750
	9.50	.826	.673
	10.50	.739	.615
	11.50	.696	.282
	12.50	.565	.071
	13.50	.522	.013
	14.50	.435	.000
	15.50	.348	.000
	16.50	.261	.000
	17.50	.130	.000
	18.50	.087	.000
	20.00	.000	.000
m6	5.00	1.000	1.000
	6.50	1.000	.962
	7.50	1.000	.910
	8.50	1.000	.853
	9.50	.957	.756
	10.50	.957	.615
	11.50	.913	.500
	12.50	.913	.410
	13.50	.913	.340
	14.50	.870	.269
	15.50	**.826**	**.218**
	16.50	**.826**	**.212**
	17.50	**.783**	**.205**
	18.50	**.783**	**.179**
	19.50	.696	.122
	20.50	.435	.103
	21.50	.348	.071
	22.50	.261	.058
	23.50	.174	.032
	24.50	.174	.026
	26.00	.130	.026
	28.00	.043	.013
	33.50	.043	.006
	39.50	.000	.006
	42.00	.000	.000

Comparison of the Area under Curve (AUC) at 3- and 6-Month between MELD and CTP Score.

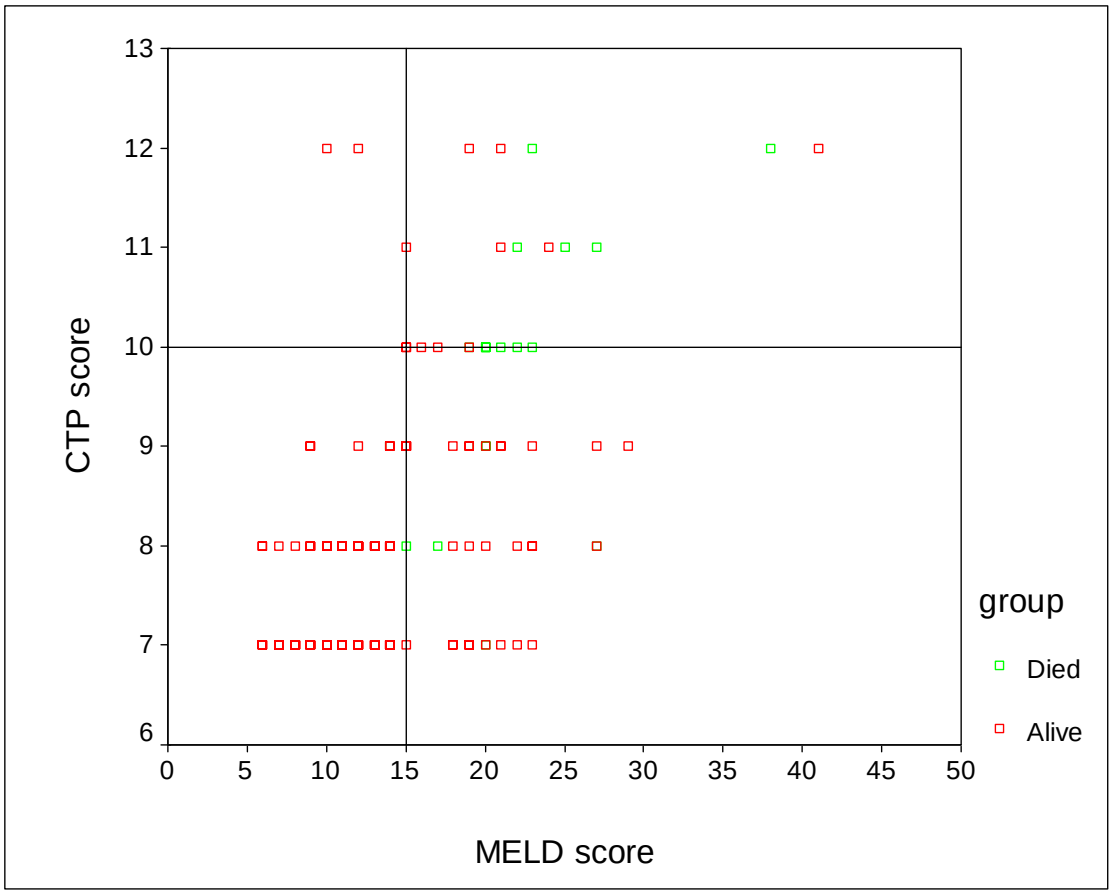
The area under ROC of the CTP and MELD score at 3 months (0.73 vs. 0.73) and at 6 months (0.73 vs. 0.82).

A cut off point of 8.5 CTP score has been found optimal to predict sensitivity of 73.9% and specificity of 79.5%.

A cut off point of 15.5 for the MELD score has been found optimal to predict Sensitivity of 82.6% and specificity of 78%.

However, when the performance of the two scores was compared at 3 and 6 months, no statistical significant difference could be found between them.

Comparative Analysis of CTP and MELD scores between the Survivors and Non survivors.



When CTP score more than 10 and MELD score more than 15 increase the risk of survival for patients on waiting list. These patients have benefit from Liver transplantation.

DISCUSSION

Child Pugh score is the commonly used prognostic model to predict the survival in cirrhotic patients and for organ allocation. The disadvantage of using child score is due to inclusion of subjective parameters and variation in the lab values. Whereas in MELD score, the parameters used are of the objective type and better in identifying increasing death risk. The results of various studies and present study which compares the CTP and MELD score in predicting survival are described below. (Table 6).

Table 6. Predictive value of CTP and MELD Score for Survival in Patients with Chronic Liver Disease.

Reference	Year	Study population	Patients	End point	C stat CTP	C stat MELD
Angermayr et al	2002	Chronic liver disease	475	3 month	0.70	0.72
Botta F et al	2003	Cirrhosis	1291	1 year mortality	0.69	0.67
Wiesner RH et al.	2003	Cirrhosis	3437	3 month mortality	0.76	0.83
Giannini et al	2004	Chronic liver disease	145	3 months	0.75	0.95
Daniel Gotthardt et al	2009	Cirrhosis	268	2 years	0.73	0.68
Present study	2009	Cirrhosis	196	6 month mortality	0.73	0.82

Angermayr *et al.*,[33] analysed retrospectively the largest series (n = 475) of cirrhotics who had elective TIPS placement. In multivariate analysis, MELD was the single independent predictor for both overall and 3-month survival. However, the predictive accuracy of MELD score for 1-month, 3-month and

1-year survival was not significantly different, compared with the CTP (c-statistics for 3-month survival: 0.72 vs. 0.70).

Botta *et al* [6]. evaluated the short- and medium-term prognosis in a European series of 129 cirrhotics followed for at least 1 year, comparing the MELD and CTP scores. All patients had monoethylglycinexylidide (MEGX) test. They recorded 12 deaths within 6 months and 31 within 1 year of follow-up. MELD score showed significant correlation with both MEGX ($r = 0.542$, $P < 0.0001$) and CTP ($r = 0.817$, $P < 0.0001$). The c-statistics for CTP, MELD and MEGX were similar for 6-month (0.82, 0.79 and 0.82, respectively) and 12-month survival (0.69, 0.67 and 0.68, respectively).

Wiesner RH et al [52] ,in their prospective study, MELD score was applied to estimate 3-month mortality to 3437 adult liver transplant candidates with chronic liver disease between November 1999 and December 2001. In this study cohort with chronic liver disease, 412 (12%) died during the 3-month follow-up period. Waiting list mortality increased directly in proportion to the listing MELD score. Patients having a MELD score <9 experienced a 1.9% mortality, whereas patients having a MELD score ≥40 had a mortality rate of 71.3%. Using the c-statistic with 3-month mortality as the end point, the area under the receiver operating characteristic (ROC) curve for the

MELD score was 0.83 compared with 0.76 for the Child-Turcotte-Pugh (CTP) score ($P < 0.001$).

Giannini *et al* [53] evaluated the predictive values of MELD and CTP scores for 3-month mortality in 145 European cirrhotic patients. Comparison of the c-statistics for CTP and MELD scores, showed that the MELD score was significantly better than the CTP score (0.95 vs. 0.75) .

Daniel Gotthardt et al [54] in 2009 studied 268 consecutive patients listed for single-organ liver transplantation for non fulminant liver disease between 2003 and 2005. Comparing the predictive abilities of CTP and MELD scores, the best discrimination between patients still alive on the waiting list and patients who died on or were removed from the waiting list was achieved at a CTP score of ≥9 and a MELD score of ≥14.4. The sensitivity and specificity to identify mortality or severe deterioration for CTP was 69.0% and 70.5%, respectively and for MELD, it was 62.1% and 72.7% respectively. This result was supported by the AUC analysis showing a strong trend for superiority of CTP over MELD scores (AUROC 0.73 and 0.68, resp.; p = 0.091).

Botta F et al., and Daniel Gotthardt et al compared CTP and MELD shows CTP is good in predicting survival over MELD score in contrast to the

study by Angermayr et al, Wiesner RH et al, and Giannini et shows MELD score is good in predicting survival over CTP score .

In the Present study, CTP and MELD scores had almost identical discriminative ability for 3 month (0.73 vs. 0.73) survival, but MELD score was better in predicting 6 month(0.82 vs. 0.73) survival compared with CTP score. In this Present study MELD score is good in predicting survival over CTP score which is supported by the above studies.

Analyzing the data, it is evident that MELD is superior to the CTP scoring system in predicting the survival in patients waiting for Liver transplantation.

Possibly, the most important study limitations were the relatively small sample size and the major drawbacks of the MELD score related to wide variability of laboratory parameters such as serum creatinine and bilirubin.

The clinical scenario of patients with early to late stage cirrhosis may vary widely, appropriate modifications and fine tuning of MELD are necessary in determining the ranking status of patients on the waiting list, in order to avoid futile transplantations.

SUMMARY

The study was done in 201 patients with end stage liver disease who were waiting for liver transplantation. Five patients underwent Liver transplantation during observational period and were excluded from the study. The remaining 196 patients were taken in to the study. This was undertaken to assess the predictor of survival at 3 month and 6 month period on waiting list.

A detailed history elicited as per proforma enclosed and through examination done. The baseline investigation which includes Hemogram, blood sugar, Serum Creatinine, Liver function test and Prothrombin Time (INR) were done .The Baseline, 3 month and 6 month CTP and MELD scores were calculated. The mean age of the study population was 45.9 years (18-65). Of the 196 patients, 150 were male and 46 were female. 41.8%of patients suffered from alcoholic liver disease and 23.4% from virus hepatitis-induced cirrhosis.

Other etiologies accounted for 39.7%. The Mean CTP score at baseline, 3 months and 6 months was 7.4, 7.39 and 7.88 respectively for patients in the waiting list and 7.63, 8.9 and 9.48 respectively for patients who died on waiting.

The Mean MELD score at baseline, 3 months and 6 months was 10.35, 10.37 and 12.99 respectively for patients in the waiting list and 10.8, 17.25 and 20.57 respectively for patients who died on waiting.

This study shows CTP and MELD scores had almost identical discriminative ability for 3 month (0.73 vs. 0.73) survival, but MELD score was better in predicting 6 month(0.82 vs. 0.73) survival compared with CTP score.

Thus, there is good evidence to support the fact that MELD is superior to the CTP scoring system in predicting the survival in patients waiting for Liver transplantation.

Child-Pugh classification has been a reference for more than 30 years for assessing the prognosis of cirrhosis. MELD score comes as the most serious challenger for replacing Child-Pugh score and overcoming its limitations.

The principal advantages of MELD score are that

1. Variables selected based on statistical analysis rather than clinical judgment.
2. Variables are objective and unlikely to be influenced by external factors.
3. Each variable is weighted according its proper influence on prognosis.

In listed patients for liver transplantation, the CTP score more than 10 and MELD score more than 15 increases the risk of mortality. These patients are

prioritized in the list for Liver transplantation to achieve maximum benefit of transplantation. However to overcome the pitfalls of MELD scoring system, modification can be done to include other clinical and biochemical parameters for predicting better survival.

CONCLUSION

The present study highlights the following,

- The prognostication based on Child Pugh and MELD scores had almost identical discriminative ability for predicting 3Month (0.73 vs. 0.73) survival in patients on Transplant Waiting list.
- The MELD score was better in predicting 6 month (0.82 vs. 0.73) survival when compared with CTP score.
- A cut off point of 8.5 CTP score has been found optimal to predict sensitivity of 73.9% and specificity of 79.5%.
- A cut off point of 15.5 for the MELD score has been found optimal to predict Sensitivity of 82.6% and specificity of 78%.

In the setting of Liver transplant, the MELD may score better over the CTP score in determination of priorities for organ allocation.

BIBLIOGRAPHY

1. Calabresi G, Bobbit P: Tragic choices the conflicts society confronts in the allocation of tragically scarce resources. New York, WW Norton, 1978.
2. Kamath PS, Wiesner RH, MalinchocM, et al. A model to predict survival in patients with end-stage liver disease. Hepatology. 2001; 33:464–470
3. Malinchoc M, Kamath PS, Gordon FD, et al. A model to predict poor survival in patients undergoing transjugular intrahepatic portosystemic shunts. Hepatology. 2000; 31:864–871.
4. Freeman RB, Wiesner RH, Edwards E, et al. Results of the first year of the new liver allocation plan. Liver Transplant. 2004;10:7–15.
5. Degre D, Bourgeois N, Boon N, et al. Aminopyrine breath test compared to the MELD and Child-Pugh scores for predicting mortality among cirrhotic patients awaiting liver transplantation. Transplant Int. 2004;17:31–38.
6. Botta F, Giannini E, Romagnoli P, et al. MELD scoring system is useful for predicting prognosis in patients with liver cirrhosis and is

correlated with residual liver function: a European study. Gut. 2003;52:134–139.

7. The U.S. Scientific Registry of Transplant Recipients and The Organ Procurement and Transplantation Network. Transplant Data 1988-1996.
8. Child CG, Turcotte JG. Surgery and portal hypertension. In: Child CG, editor. The liver and portal hypertension. Philadelphia: W. B. Saunders Co., 1964; 50.
9. Pugh RN, Murray-Lyon IM, Dawson JL, Pietroni MC, Williams R. Transection of the oesophagus for bleeding oesophageal varices. Br J Surg 1973;60:646–649.
10. Fleck A, Raines G, Hawker F, Trotter J, Wallace PI, Ledingham IM, et al. Increased vascular permeability: a major cause of hypoalbuminaemia in disease and injury. Lancet 1985;1:781–784.
11. Henriksen JH, Parving HH, Christiansen L, Winkler K, Lassen NA. Increased transvascular escape rate of albumin during experimental portal and hepatic venous hypertension in the pig. Relation to findings in patients with cirrhosis of the liver. Scand J Clin Lab Invest 1981;41: 289–299.
12. Moseley RH. Sepsis and cholestasis. Clin Liver Dis 2004;8:83–94.

13. Plessier A, Denninger MH, Consigny Y, Pessione F, Francoz C, Durand F, et al. Coagulation disorders in patients with cirrhosis and severe sepsis. Liver Int 2003;23:440–448.
14. Kunze K. Metabolic encephalopathies. J Neurol 2002;249: 1150–1159.
15. Fernandez-Esparrach G, Sanchez-Fueyo A, Gines P, Uriz J, Quinto L, Ventura PJ, et al. A prognostic model for predicting survival in cirrhosis with ascites. J Hepatol 2001;34:46–52.
16. Merkel C, Bolognesi M, Sacerdoti D, Bombonato G, Bellini B, Bighin R, et al. The hemodynamic response to medical treatment of portal hypertension as a predictor of clinical effectiveness in the primary prophylaxis of variceal bleeding in cirrhosis. Hepatology 2000;32:930–934.
17. Hartmann IJ, Groeneweg M, Quero JC, Beijeman SJ, de Man RA, Hop WC, et al. The prognostic significance of subclinical hepatic encephalopathy. Am J Gastroenterol 2000;95:2029–2034.
18. Barbara L, Benzi G, Gaiani S, Fusconi F, Zironi G, Siringo S, et al. Natural history of small untreated hepatocellular carcinoma in cirrhosis: a multivariate analysis of prognostic factors of tumor growth rate and patient survival. Hepatology 1992;16:132–137.

19. Mansour A, Watson W, Shayani V, Pickleman J. Abdominal operations in patients with cirrhosis: still a major surgical challenge. Surgery 1997;122:730–735 [discussion 735–736].

20. Gluud C, Henriksen JH, Nielsen G. Prognostic indicators in alcoholic cirrhotic men. Hepatology 1988;8:222–227.

21. Planas R, Balleste B, Alvarez MA, Rivera M, Montoliu S, Galeras JA,et al.Natural history of decompensated hepatitis C virus-related cirrhosis. A study of 200 patients. J Hepatol 2004;40:823–830.

22. Shetty K, Rybicki L, Carey WD. The Child–Pugh classification as a prognostic indicator for survival in primary sclerosing cholangitis. Hepatology 1997;25:1049–1053.

23. van Dam GM, Gips CH, Reisman Y, Maas KW, Purmer IM, Huizenga JR, et al. Major clinical events, signs and severity assessment scores related to actual survival in patients who died from primary biliary cirrhosis. A long-term historical cohort study. Hepatogastroenterology 1999;46:108–115.

24. Zeitoun G, Escolano S, Hadengue A, Azar N, El Younsi M, Mallet A, et al. Outcome of Budd–Chiari syndrome: a multivariate analysis of factors related to survival including surgical portosystemic shunting. Hepatology 1999;30:84–89.

25. Testa R, Valente U, Risso D, Caglieris S, Giannini E, Fasoli A, et al. Can the MEGX test and serum bile acids improve the prognostic ability of Child–Pugh's score in liver cirrhosis? Eur J Gastroenterol Hepatol 1999;11:559–563.

26. Merkel C, Bolognesi M, Bellon S, Bianco S, Honisch B, Lampe H, et al. Aminopyrine breath test in the prognostic evaluation of patients with cirrhosis. Gut 1992;33:836–842.

27. Albers I, Hartmann H, Bircher J, Creutzfeldt W. Superiority of the Child–Pugh classification to quantitative liver function tests for assessing prognosis of liver cirrhosis. Scand J Gastroenterol 1989;24: 269–276.

28. Merkel C, Bolognesi M, Finucci GF, Angeli P, Caregaro L, Rondana M, et al. Indocyanine green intrinsic hepatic clearance as a prognostic index of survival in patients with cirrhosis. J Hepatol 1989;9:16–22.

29. Merli M, Riggio O, Dally L. Does malnutrition affect survival in cirrhosis? PINC (Policentrica Italiana Nutrizione Cirrosi) Hepatology 1996;23:1041–1046.

30. Johnson P, Bruix J. Hepatocellular carcinoma and the art of prognostication. J Hepatol 2000;33:1006–1008.

31. Friedman LS. The risk of surgery in patients with liver disease. Hepatology 1999;29:1617–1623.

32. Gines P, Quintero E, Arroyo V, Teres J, Bruguera M, Rimola A, et al. Compensated cirrhosis: natural history and prognostic factors. Hepatology 1987;7:122–128.

33. Angermayr B, Cejna M, Karnel F, Gschwantler M, Koenig F, Pidlich J, et al. Child–Pugh versus MELD score in predicting survival in patients undergoing transjugular intrahepatic portosystemic shunt. Gut 2003;52:879–885.

34. Said A, Williams J, Holden J, Remington P, Gangnon R, Musat A,et al. Model for end stage liver disease score predicts mortality across a broad spectrum of liver disease. J Hepatol 2004;40:897–903.

35. Longheval G, Vereerstraeten P, Thiry P, Delhaye M, le Moine O, Deviere J, et al. Predictive models of short- and long-term survival in patients with nonbiliary cirrhosis. Liver Transpl 2003;9:260–267.

36. Malinchoc M, Kamath PS, Gordon FD, Peine CJ, Rank J, ter Borg PC.A model to predict poor survival in patients undergoing transjugular intrahepatic portosystemic shunts. Hepatology 2000;31:864–871.

37. Christensen E. Prognostic models in chronic liver disease: validity, usefulness and future role. J Hepatol 1997;26:1414–1424.

38. Salerno F, Borroni G, Moser P, Sangiovanni A, Almasio P,Budillon G, et al. Prognostic value of the galactose test in predicting survival of patients with cirrhosis evaluated for liver transplantation. A prospective multicenter Italian study. AISF Group for the Study of Liver Transplantation. Associazione Italiana per lo Studio del Fegato. J Hepatol 1996;25:474–480.

39. Zoli M, Iervese T, Merkel C, Bianchi G, Magalotti D, Marchesini G,et al. Prognostic significance of portal hemodynamics in patients with compensated cirrhosis. J Hepatol 1993;17:56–61.

40. Pessione F, Ramond MJ, Peters L, Pham BN, Batel P, Rueff B, et al.Five-year survival predictive factors in patients with excessive alcohol intake and cirrhosis. Effect of alcoholic hepatitis, smoking and abstinence. Liver Int 2003;23:45–53.

41. Christensen E. Prognostic models including the Child–Pugh, MELD and Mayo risk scores-where are we and where should we go? J Hepatol 2004;41:344–350.

42. Freeman Jr RB, Edwards EB. Liver transplant waiting time does not correlate with waiting list mortality: implications for liver allocation policy. Liver Transpl 2000;6:543–552.

43. Schepke M, Roth F, Fimmers R, Brensing KA, Sudhop T, Schild HH, et al. Comparison of MELD, Child–Pugh, and Emory model for the prediction of survival in patients undergoing transjugular intrahepatic portosystemic shunting. Am J Gastroenterol 2003;98:1167–1174.

44. Kremers WK, van IM, Kim WR, Freeman RB, Harper AM, Kamath PS, et al. MELD score as a predictor of pretransplant and posttransplant survival in OPTN/UNOS status 1 patients. Hepatology 2004;39:764–769.

45. Freeman RB, Wiesner RH, Edwards E, Harper A, Merion R, Wolfe R.Results of the first year of the new liver allocation plan. Liver Transpl 2004;10:7–15.

46. Sharma P, Balan V, Hernandez JL, Harper AM, Edwards EB, Rodriguez-Luna H, et al. Liver transplantation for hepatocellular carcinoma: the MELD impact. Liver Transpl 2004;10:36–41.

47. Hayashi PH, Trotter JF, Forman L, Kugelmas M, Steinberg T, Russ P,et.al Impact of pretransplant diagnosis of hepatocellular carcinoma

on cadveric liver allocation in the era of MELD. Liver Transpl 2004;10:2–48.

48. Durand F, Regimbeau JM, Belghiti J, Sauvanet A, Vilgrain V, Terris B, et al. Assessment of the benefits and risks of percutaneous biopsy before surgical resection of hepatocellular carcinoma. J Hepatol 2001;35:254–258.

49. Onaca NN, Levy MF, Sanchez EQ, Chinnakotla S, Fasola CG,Thomas MJ, et al. A correlation between the pretransplantation MELD score and mortality in the first two years after liver transplantation. Liver Transpl 2003;9:117–123.

50. Desai NM, Mange KC, Crawford MD, Abt PL, Frank AM, Markmann JW, et al. Predicting outcome after liver transplantation: utility of the model for end-stage liver disease and a newly derived discrimination function. Transplantation 2004;77:99–106.

51. Jacob M, Copley LP, Lewsey JD, Gimson A, Toogood GJ, Rela M, et al. MELD Pretransplant score and post liver transplantation survival in the UK and Ireland. Liver Transpl 2004;10:903–907.

52. Wiesner R, Edwards E, Freeman R, Harper A, Kim R, Kamath P, et al. Model for end-stage liver disease (MELD) and allocation of donor livers. Gastroenterology 2003;124:91–96.

53. Giannini E, Botta F, Fumagalli A, *et al*. Can inclusion of serum creatinine values improve the Child-Turcotte-Pugh score and challenge the prognostic yield of the model for end-stage liver disease score in the short-term prognostic assessment of cirrhotic patients? *Liver Int* 2004; 24: 465-70.

54. Daniel Gotthardt etal, Limitations of the MELD score in predicting mortality or need for removal from waiting list in patients awaiting liver transplantation *BMC Gastroenterology* 2009, 9:72

SNO	Name	Age	Sex	MGE No	Alcohol	HBV	HCV	
1	paneerselvam	52	1	3638/09	1	2	2	
2	sekar	50	1	4752/09	1	2	2	
3	deivannai	60	2	486/08	1	2	1	
4	papammal	57	2	912/09	1	2	2	
5	samydurai	45	1	5883/07	2	1	2	
6	shankari	35	2	47285	2	2	2	
7	raja	39	1	4712/09	1	2	2	
8	kannagi	29	2	1034/05	1	1	2	
9	selvi	40	2	5335/09	2	1	1	
10	ponmarimuthu	40	1	2267/09	1	2	2	
11	ALAMELU	50	2	5103/09	1	2	2	
12	sathyanathan	55	1	6379/09	1	2	2	
13	ranganathan	58	1	4302/09	2	2	2	
14	Gandhi	55	1	1752/09	1	2	2	
15	armugam	39	1	1927/08	2	2	2	
16	durairaj	53	1	5394/03	1	2	2	
17	sukumar	51	1	3118/09	1	2	2	
18	dominic savio	49	1	4202/02	1	2	2	
19	Rajasekar	48	1	6210/09	1	2	1	
20	kamali	30	2	1532/06	2	2	2	
21	shantakumar	52	1	4955/07	2	2	2	
22	Balaji	18	1	4441/04	2	2	2	
23	shankari	27	2	1136/07	2	2	2	
24	duraiappan	36	1	1584	1	2	2	
25	Uma	24	2	1514/04	2	2	2	
26	subramani	38	1	2192/06	1	2	2	
27	chengalvarayan	50	1	6185/08	2	2	2	
28	baskar	46	1	3155/09	2	2	2	
29	Dhanasekaran	47	1	3063/09	2	2	2	
30	selvaraj	42	1	4506/02	2	2	2	
31	Kesavan	40	1	1385/09	1	2	2	
32	srinivasan	35	1	6280/07	2	2	2	
33	mohammed ali	43	1	6464/09	2	2	2	
34	vasudevan	45	1	796/08	1	2	2	
35	sivaprasad	46	1	4215/08	2	2	2	
36	almas	48	2	1166/01	2	2	2	
37	sahasranamam	44	2	4817/09	1	2	2	
38	kotti	55	1	4784/09	1	2	2	
39	Rani	50	2	6048/09	1	2	2	
40	raman	47	1	7065/07	2	1	2	
41	vijayaraghavan	50	1	4839/08	2	2	2	
42	vasu	40	1	2507/09	1	2	2	
43	Parthasarathy	47	1	6355/09	2	2	2	
44	lakshmi	40	2	1618/08	2	2	2	
45	sekar	30	1	6557/07	2	2	2	
46	kuppamal	40	2	1726/05	2	2	2	
47	Krishnan	58	1	476/06	1	2	2	
48	VELLAPONDI	44	1	4984/09	2	2	2	
49	Jayalakshmi	50	2	5458/09	2	2	2	
50	Kurshith begam	48	2	736/04	2	2	2	

51	hariprasad	5	1	3954/09	2	2	2
52	raja	50	1	2760/09	2	2	2
53	ethiraj	51	1	5550/09	2	1	2
54	gunasekahar	58	1	4770/08	1	2	2
55	prakasam	52	1	3726/05	1	1	2
56	theboral	40	2	2973/06	2	2	2
57	Mohan	48	1	3988/07	1	2	2
58	vasantha	30	2	630/06	2	2	1
59	murali	40	1	1468/06	2	1	2
60	ekambaram	48	1	4339/09	1	2	2
61	vimal	23	1	1723/09	2	1	2
62	Loganayaki	39	2	1022/05	2	1	1
63	gajapathiraja	32	1	3540/09	2	1	2
64	murthy	36	1	4904/07	2	1	2
65	Subramani	63	1	4906/07	1	2	2
66	Kandasamy	64	1	5737/09	2	2	2
67	selavaraj	63	1	4623/09	2	2	2
68	thangavelu	65	1	459/06	2	2	2
69	Kothandan	55	1	6360/04	2	1	2
70	Banu	21	2	3765/09	2	2	2
71	SELVAM	45	1	5189/09	1	2	2
72	loganathan	45	1	3942/09	1	2	2
73	george	57	1	5196/09	2	1	1
74	RAJA	36	1	5435/09	1	1	2
75	Samsang mahariba	63	2	5683/09	2	2	1
76	gangadharan	57	1	6665/07	1	2	2
77	Kasim	36	1	5594/09	1	2	2
78	Pushparaj	46	1	899/09	2	1	2
79	Gunasekaran	49	1	6642/09	1	2	2
80	Ramesh	40	1	5392/09	1	2	2
81	Moorthi	47	1	4242/09	1	2	2
82	Chandra	40	2	6282/09	2	2	2
83	Umar Basha	50	1	1813/08	1	2	2
84	Azeezunisha	58	2	5170/09	2	2	2
85	Nagammal	58	2	5944/09	2	2	2
86	shanmuganathan	51	1	4774/09	2	1	2
87	Ravi	48	1	28/08	1	2	2
88	krishnan	50	1	4815/09	2	1	2
89	baskar	57	1	54/09	1	2	2
90	kuppan	48	1	4500/09	1	2	2
91	Rathinam	55	1	4196/09	2	2	2
92	viswanathan	33	1	4614/08	1	2	2
93	Rajendran	57	1	54/09	1	2	2
94	panchpeer	46	1	6538/04	2	2	2
95	selvakumar	30	1	5450/9	1	2	2
96	mohanraj	40	1	2867/07	2	2	2
97	kannan	36	1	2798/09	2	2	2
98	subbulakshmi	25	2	4788/09	2	2	2
99	Bhavani	31	2	1011/08	2	2	2
100	MUNIAMMAL	37	2	5000/09	2	2	2
101	rajasundar	40	1	1398/09	2	1	2

102	suresh babu	53	1	4688/04	2	2	2
103	kothandan	23	1	1490/05	2	2	2
104	maragathammal	45	2	3464/08	2	2	2
105	Narayanan	48	1	1421/06	2	1	2
106	kasturi	46	2	1285/01	2	2	2
107	suresh kumar	20	1	5901/09	2	2	2
108	JANARTHANAN	35	1	5605/09	2	2	2
109	Janarathanan	35	1	3367/09	2	2	2
110	Kumar	49	1	5889/09	1	2	2
111	satheswaran	55	1	5965/07	1	2	2
112	varadharajan	56	1	280/06	1	2	2
113	gopal	54	1	4584/05	2	2	2
114	Santhanam	18	1	6041/09	2	2	2
115	Iqbal	48	1	6415/09	2	2	2
116	Parvathy	38	2	3768/06	2	2	2
117	lakshmi	50	2	4566/07	2	2	2
118	Krithika	30	2	6015/08	2	2	2
119	rani	40	2	7208/07	2	2	2
120	kasturi	52	2	6744/03	2	1	2
121	lakshmi	55	2	6321/07	2	1	2
122	punniyakodi	55	1	1401/09	1	2	1
123	manohar	44	1	3312/09	1	2	2
124	chandrasekar	53	1	2980/07	2	2	2
125	shanmugam	41	1	3652/09	1	2	2
126	subramanin	54	1	4479/09	1	2	2
127	sudhakar	45	1	4941/09	1	1	2
128	kondiah	70	1	2584/06	2	2	2
129	ramados	53	1	6528/09	1	2	2
130	marthamma	65	2	4114/09	2	2	2
131	Babu	60	1	6320/08	1	2	2
132	Ganesan	65	1	6392/07	2	2	1
133	kathija bee	65	2	2647/09	2	2	1
134	Mohan	48	1	4613/09	1	2	2
135	annathai	64	1	4869/03	1	2	2
136	Unnamalai	58	2	2590/01	2	2	2
137	kadiravan	43	1	2015	1	2	2
138	gandhi	40	1	5628/09	1	2	2
139	VIJAYA	35	2	202	2	2	2
140	vasuki	40	2	3417/04	2	2	2
141	sarfuddhin	49	1	6572/09	1	2	2
142	DHARANIKARASI	42	2	932	2	1	2
143	Royappan	42	1	1433	1	2	2
144	vijaya kumar	38	1	1451	1	2	2
145	babu	35	1	378	1	1	2
146	siva	45	1	546/09	1	2	2
147	ganesan	55	1	1276/09	2	1	2
148	ramaraj	60	1	3700/08	2	1	2
149	Ramesh	35	1	6241/09	1	2	2
150	chinnasamy	48	1	3935/09	1	1	2
151	kannaiyan	64	1	653/09	1	2	2
152	Sankarammal	50	2	1965/05	2	1	1

153	appandai raj	65	1	1769/08	2	2	2
154	Mahalingam	64	1	75/09	1	2	2
155	Razia	42	2	3285/08	2	2	2
156	mani	55	1	2514/09	2	1	2
157	elangovan	58	1	4566/09	2	1	2
158	Kuppusamy	65	1	2453/09	2	2	2
159	Subramani	50	1	4108/07	1	2	2
160	Chandrasekar	51	1	5344/09	2	2	2
161	selvaraj	55	1	4362/09	2	1	2
162	ravi	44	1	3354/09	1	2	2
163	pedhuru	29	1	5753/09	1	2	2
164	Dr.dhansekar	51	1	5999/09	2	2	1
165	K. Krishnamoorthy	59	1	6349/09	2	2	2
166	sekar	56	1	13983	1	2	2
167	Chandrasekar	18	1	801/07	1	2	2
168	Kuppusamy	44	1	19306	2	1	2
169	Kumar	38	1	21334	1	2	2
170	Santhanu Kishore	60	1	29494	1	2	2
171	Kanniyakumar	21	1	1517/08	2	2	2
172	Leelavathy	63	2	38171	2	2	2
173	Balaji	50	1	39018	2	2	2
174	Harish Doshi	52	1	40181	1	2	2
175	Basha	45	1	43127	1	2	2
176	varlaxmi	40	2	1014/05	2	2	2
177	stanley	54	1	4036/06	1	2	2
178	sivasakthi	45	1	38321	1	2	2
179	selvaraj	41	1	33245	1	2	2
180	Pannerselvam	18	1	36176	2	2	2
181	prabu	23	1	34158	2	2	2
182	Md Safi	48	1	42167	2	2	2
183	Devaraj	59	1	23145	1	2	2
184	ravikumar	40	1	6966/07	2	2	2
185	Tamilmani	50	1	2105/07	2	2	2
186	Jeelani syed	49	1	3224/04	2	2	2
187	Ellapan	49	1	650/07	2	2	2
188	Prasad	57	1	5971/08	2	2	2
189	khaiser ahmed	36	1	4080/07	2	2	2
190	Satyanarayanan	28	1	4888/07	2	2	2
191	ashok joshi	45	1	4118/08	1	2	2
192	pandian	42	1	3996/08	1	2	2
193	kumarapillai	56	1	1558/04	2	2	2
194	Rajeswari	50	2	215/08	2	2	1
195	Prasanna Kumar	45	1	5092/09	1	2	2
196	Thirunavukarasu	63	1	512/08	2	1	2

others	Variceal Bl	H E	HRS	SBP	bilirubine a	Creatinine	INR at bas	Albumin at
2	1	1	1	2	1.1	1	1.2	2.9
2	1	1	2	2	1.1	1	1.3	2.8
2	2	2	2	2	1.2	1.2	1.1	2.2
2	2	2	2	2	1	0.8	1.2	2.4
2	1	1	1	2	1.2	0.7	1.4	2.1
1	2	2	2	2	2.1	1.1	1.3	2.2
2	1	2	2	2	1.2	0.7	1.2	2.6
2	2	2	2	2	1.1	0.9	1.4	2.1
2	1	2	2	2	2.3	1.1	1.4	1.9
2	1	2	2	2	1.1	0.6	1.2	2.1
2	2	2	2	2	0.7	0.8	1.2	2.1
2	1	2	2	2	1.2	0.8	1.3	2.2
1	2	2	2	2	1.1	0.9	1.1	1.9
2	1	2	2	2	1.2	1.1	1.2	2.1
1	2	2	2	2	2.1	1.2	1.1	1.9
2	1	2	2	2	1.3	0.8	1.2	2.1
2	1	2	2	2	0.8	0.7	1.1	2.4
2	1	2	2	2	1.4	1.1	1.3	1.8
2	1	2	2	2	1.2	0.7	1.1	2.3
1	2	2	2	2	2.3	0.7	1.2	2.1
1	1	2	2	2	2.1	1.1	1.2	2.6
1	2	2	2	2	1.4	1.2	1.4	2.8
1	2	2	2	2	0.8	0.9	1.2	2.4
2	1	2	2	2	0.7	1.2	1.4	2.1
1	2	2	2	2	1.1	1.2	1.2	2.4
2	1	2	2	2	3.1	1	1	2.1
1	2	2	2	2	2.1	1.1	1.1	2.4
1	1	2	2	2	1.1	0.8	1.1	2.2
1	2	2	2	2	1.4	0.6	1.3	2.6
1	2	2	2	2	0.8	0.6	1.5	2
2	1	1	1	1	0.6	0.8	1.2	2.4
1	1	2	2	2	1.4	0.7	1.1	2.8
1	2	2	2	2	1.3	0.8	1.4	2.6
2	1	2	2	2	1.1	1.1	1.3	2.9
1	2	2	2	2	1.6	1.2	1.2	2.2
1	2	1	2	2	0.9	1.2	1.1	2.3
2	1	1	1	2	2.1	1.1	1.2	2.6
2	1	2	2	2	2.1	1.1	1.3	2.2
2	1	1	2	1	1.2	0.7	1.2	2.6
2	1	2	2	2	1.1	0.9	1.4	2.1
1	1	2	2	2	2.3	1.1	1.4	1.9
2	1	2	2	2	1.1	0.6	1.2	2.1
1	2	2	2	2	0.7	0.8	1.2	2.1
1	2	2	2	2	1.2	0.8	1.3	2.2
1	2	2	2	2	1.1	0.9	1.1	1.9
1	1	2	2	2	1.2	1.1	1.2	2.1
2	2	2	2	2	2.1	1.2	1.1	1.9
1	1	2	2	2	1.3	0.8	1.2	2.1
1	1	2	2	2	0.8	0.7	1.1	2.4
1	1	2	2	1	1.4	1.1	1.3	1.8

1	2	2	2	2	1.2	0.7	1.1	2.3
1	2	2	2	2	2.3	0.7	1.2	2.1
2	1	2	2	2	2.1	1.1	1.2	2.6
2	1	2	2	2	1.4	1.2	1.4	2.8
2	1	2	2	2	0.8	0.9	1.2	2.4
1	2	1	2	2	0.7	1.2	1.4	2.1
2	2	2	2	2	1.1	1.2	1.2	2.4
2	1	2	2	2	3.1	1	1	2.1
2	2	2	2	2	2.1	1.1	1.1	2.4
2	1	2	2	2	1.1	0.8	1.1	2.2
2	1	2	2	2	1.4	0.6	1.3	2.6
2	1	2	2	2	0.8	0.6	1.5	2
2	1	2	2	2	1.3	0.8	1.2	2.1
2	2	2	2	2	0.8	0.7	1.1	2.4
2	1	2	2	2	1.4	1.1	1.3	1.8
1	2	2	2	2	1.2	0.7	1.1	2.3
1	2	1	1	1	2.3	0.7	1.2	2.1
1	2	2	2	2	2.1	1.1	1.2	2.6
2	1	2	2	2	2.1	1.1	1.3	2.2
1	2	2	2	2	1.2	0.7	1.2	2.6
2	2	1	1	2	3.1	1	1	2.1
2	2	2	2	2	2.1	1.1	1.1	2.4
2	2	2	2	2	1.1	0.8	1.1	2.2
2	2	2	2	2	1.4	0.6	1.3	2.6
2	1	2	2	2	0.8	0.6	1.5	2
2	1	2	2	2	0.7	1.2	1.4	2.1
2	1	2	2	2	1.1	1.2	1.2	2.4
2	2	2	2	2	3.1	1	1	2.1
2	1	2	2	2	2.1	1.1	1.1	2.4
2	1	2	2	2	1.1	0.8	1.1	2.2
2	1	2	2	2	1.4	0.6	1.3	2.6
1	2	2	2	2	0.8	0.6	1.5	2
2	1	2	2	2	0.6	0.8	1.2	2.4
1	1	2	2	2	1.3	0.8	1.4	2.6
1	1	2	2	2	1.4	0.7	1.1	2.8
2	1	2	2	2	1.1	0.9	1.1	1.9
2	1	2	2	2	1.2	1.1	1.2	2.1
2	1	2	2	2	2.1	1.2	1.1	1.9
2	1	1	2	2	1.3	0.8	1.2	2.1
2	1	2	2	2	0.8	0.7	1.1	2.4
1	1	2	2	2	1.4	1.1	1.3	1.8
2	1	1	2	2	1.2	0.7	1.1	2.3
2	1	1	1	1	2.3	0.7	1.2	2.1
1	1	2	2	2	2.1	1.1	1.2	2.6
2	1	2	2	2	1.4	1.2	1.4	2.8
1	1	2	2	2	0.8	0.9	1.2	2.4
1	2	2	2	2	0.7	1.2	1.4	2.1
1	2	2	2	2	1.1	1.2	1.2	2.4
1	1	2	2	2	3.1	1	1	2.1
1	1	2	2	2	2.1	1.1	1.1	2.4
2	1	2	2	2	1.1	0.8	1.1	2.2

1	1	2	2	2	1.4	0.6	1.3	2.6
1	1	2	2	2	0.8	0.6	1.5	2
1	1	2	2	2	0.6	0.8	1.2	2.4
2	2	2	2	2	1.4	0.7	1.1	2.8
1	2	2	2	2	1.3	0.8	1.4	2.6
1	2	2	2	2	1.1	1.1	1.3	2.9
1	2	2	2	2	1.6	1.2	1.2	2.2
1	1	2	2	2	0.9	1.2	1.1	2.3
2	1	2	2	2	1.4	1.1	1.3	1.8
2	1	2	2	2	1.2	0.7	1.1	2.3
2	1	2	2	2	2.3	0.7	1.2	2.1
1	1	2	2	2	2.1	1.1	1.2	2.6
1	1	2	2	2	2.1	1.1	1.3	2.2
1	1	2	2	2	1.2	0.7	1.2	2.6
1	2	2	2	2	1.1	0.9	1.4	2.1
2	1	2	2	2	2.3	1.1	1.4	1.9
1	1	1	2	2	1.1	0.6	1.2	2.1
1	1	2	2	2	0.7	0.8	1.2	2.1
2	1	2	2	2	1.2	0.8	1.3	2.2
2	1	2	2	2	1.1	0.9	1.1	1.9
2	1	2	2	2	1.2	1.1	1.2	2.1
2	1	2	2	2	2.1	1.2	1.1	1.9
2	2	2	2	2	1.3	0.8	1.2	2.1
2	1	2	2	2	0.8	0.7	1.1	2.4
2	1	2	2	2	1.4	1.1	1.3	1.8
2	1	2	2	2	1.2	0.7	1.1	2.3
1	1	2	2	2	2.3	0.7	1.2	2.1
2	1	2	2	2	2.1	1.1	1.2	2.6
2	1	2	2	2	1.4	1.2	1.4	2.8
2	1	1	1	2	0.8	0.9	1.2	2.4
2	1	2	2	2	0.7	1.2	1.4	2.1
2	1	2	2	2	1.1	1.2	1.2	2.4
2	1	1	1	2	3.1	1	1	2.1
2	1	2	2	2	2.1	1.1	1.1	2.4
1	1	2	2	2	1.1	0.8	1.1	2.2
2	1	2	2	2	1.4	0.6	1.3	2.6
2	2	2	2	2	0.8	0.6	1.5	2
1	1	2	2	2	1.3	0.8	1.4	2.6
1	1	2	2	2	1.1	1.1	1.3	2.9
2	1	2	2	2	1.6	1.2	1.2	2.2
2	1	2	2	2	0.9	1.2	1.1	2.3
2	1	2	2	2	2.1	1.1	1.1	2.4
2	1	2	2	2	1.4	0.6	1.3	2.6
2	1	2	2	2	1.1	0.8	1.1	2.2
2	2	2	2	2	1.3	0.8	1.2	2.1
2	2	2	2	2	0.8	0.7	1.1	2.4
2	2	2	2	2	1.4	1.1	1.3	1.8
2	2	2	2	2	1.2	0.7	1.1	2.3
2	2	2	2	2	2.3	0.7	1.2	2.1
2	2	2	2	2	2.1	1.1	1.2	2.6
2	2	2	2	2	1.4	1.2	1.4	2.8

1	2	2	2	2	0.8	0.9	1.2	2.4
2	2	1	1	2	0.7	1.2	1.4	2.1
1	2	2	2	2	3.1	1	1	2.1
2	2	2	2	2	1.1	1.2	1.2	2.4
2	2	1	2	2	0.8	0.8	1	2.2
1	1	2	2	2	1.2	0.8	1.1	2.1
2	1	2	2	2	1.3	1	1	2.4
1	1	2	2	2	1.4	0.90	1.1	2.3
2	2	1	2	2	1.2	1.1	1.2	2.1
2	1	2	2	2	1.3	0.9	1.1	2.1
2	2	2	2	2	1.1	0.8	0.8	2
2	1	2	2	2	1.1	1.2	1.9	2.3
1	1	2	2	2	1.2	1.1	1.3	2.6
2	2	2	2	2	1.2	0.9	1.1	2.3
2	2	1	2	2	1	1.2	1.3	2.3
2	2	2	2	2	1.1	1.1	1.2	1.9
2	2	1	2	2	1.4	1.3	1.2	1.9
2	2	1	1	2	1.7	0.8	1.2	2.4
1	2	1	2	2	1.3	1.2	1.1	2.1
1	1	1	1	2	1.6	1.2	1.2	2.1
1	1	2	2	2	1.1	1.1	1.3	2.3
2	2	1	1	2	1.7	0.9	1.2	2.2
2	1	1	2	2	1.2	1.2	1	2.1
1	2	1	1	2	1.2	0.9	1.1	2.4
2	2	1	1	2	1.2	0.9	1	1.8
2	1	1	1	2	1.1	1.1	1.2	2.5
2	2	1	1	2	1.2	1.1	1.1	2.2
1	1	1	1	2	11.1	1.36	1.3	2.3
1	1	1	1	2	7	0.9	1.5	2.4
1	1	2	1	1	2.3	0.8	1.3	2.4
2	1	2	2	2	1.8	0.7	1.1	2.6
1	1	2	2	2	1.2	1	1.6	2.4
1	1	1	1	2	1.5	1.2	1	2.1
1	2	1	1	2	1.4	1	1.3	2.5
1	1	2	2	2	1.1	1.6	1.2	2.4
1	2	2	2	2	1.1	1.2	1.1	2.2
1	1	2	2	2	2.4	0.5	1.2	1.9
1	2	2	2	2	1.3	1	1.3	1.8
2	1	2	2	2	1.2	1.1	1.1	1.9
2	1	1	1	2	1.2	1.3	1.2	2.4
1	2	1	1	1	2.1	0.7	1.7	2
2	1	2	2	2	1.5	0.6	1.2	2.5
2	1	1	1	1	1	1.1	1.2	2.1
2	2	1	1	2	8.4	0.4	1.6	1.8

CTP score at Baseline	MELDscore at Baseline	Bilirubin 3 months	Creatinine 3 Months	INR 3 months
7	9	1.2	1.2	1.1
7	10	1.3	1.4	0.9
8	10	1	1.3	1.1
7	8	1.2	1.6	1
8	11	1.2	0.8	1.3
8	13	1.1	0.9	1.1
8	9	1.2	1.1	1.2
8	11	2.1	1.2	1.1
8	14	1.3	0.8	1.2
7	9	0.8	0.7	1.1
7	8	1.4	1.1	1.3
8	10	1.2	0.7	1.1
8	8	2.3	0.7	1.2
7	10	2.1	1.1	1.2
8	12	1.4	1.2	1.4
7	9	0.8	0.9	1.2
7	7	0.7	1.2	1.4
8	12	1.1	1.2	1.2
7	8	3.1	1	1
7	12	2.1	1.1	1.1
7	12	1.1	0.8	1.1
8	13	1.4	0.6	1.3
7	8	1.4	1.2	1.4
7	12	0.8	0.9	1.2
7	11	0.7	1.2	1.4
8	11	1.1	1.2	1.2
8	11	3.1	1	1
7	8	2.1	1.1	1.1
7	11	1.1	0.8	1.1
7	11	1.4	0.6	1.3
7	8	0.8	0.6	1.5
7	9	0.6	0.8	1.2
8	11	1.4	0.7	1.1
8	11	1.3	0.8	1.4
8	12	1.1	1.1	1.3
7	9	1.6	1.2	1.2
7	12	0.7	0.8	1.2
8	13	1.2	0.8	1.3
8	9	1.1	0.9	1.1
8	11	1.2	1.1	1.2
8	14	2.1	1.2	1.1
7	9	1.3	0.8	1.2
7	8	0.8	0.7	1.1
8	10	1.4	1.1	1.3
8	8	1.2	0.7	1.1
7	10	2.3	0.7	1.2
8	12	2.1	1.1	1.2
7	9	1.4	1.2	1.4
7	7	0.8	0.9	1.2
8	12	0.7	1.2	1.4

7	8	1.1	1.2	1.2
7	12	3.1	1	1
7	12	2.1	1.1	1.1
8	13	1.1	0.8	1.1
7	8	1.4	0.6	1.3
7	12	0.8	0.6	1.5
7	11	0.7	1.2	1.4
8	11	1.1	1.2	1.2
8	11	3.1	1	1
7	8	2.1	1.1	1.1
7	11	1.1	0.8	1.1
7	11	1.4	0.6	1.3
7	9	0.8	0.6	1.5
7	7	0.7	1.2	1.4
8	12	1.1	1.2	1.2
7	8	3.1	1	1
7	12	2.1	1.1	1.1
7	12	1.1	0.8	1.1
8	13	1.4	0.6	1.3
8	9	0.8	0.6	1.5
8	11	0.6	0.8	1.2
8	11	1.4	0.7	1.1
7	8	1.3	0.8	1.4
7	11	1.1	1.1	1.3
7	11	1.6	1.2	1.2
7	12	0.9	1.2	1.1
7	11	2.1	1.1	1.1
8	11	1.1	0.8	1.1
8	11	1.2	0.7	1.2
7	8	1.1	0.9	1.4
7	11	2.3	1.1	1.4
7	11	1.1	0.6	1.2
7	8	0.7	0.8	1.2
8	11	1.1	0.9	1.1
7	9	1.2	0.8	1.3
8	8	2.1	1.2	1.1
7	10	1.3	0.8	1.2
8	12	0.8	0.7	1.1
7	9	1.4	1.1	1.3
7	7	1.2	0.7	1.1
8	12	2.3	0.7	1.2
7	8	2.1	1.1	1.2
7	12	1.4	1.2	1.4
7	12	0.8	0.9	1.2
8	13	0.7	1.2	1.4
7	8	1.1	1.2	1.2
7	12	3.1	1	1
7	11	2.1	1.1	1.1
8	11	1.1	0.8	1.1
8	11	1.4	0.6	1.3
7	8	1.4	1.2	1.4

7	11	0.8	0.9	1.2
7	11	0.7	1.2	1.4
7	8	1.1	1.2	1.2
7	9	3.1	1	1
8	11	2.1	1.1	1.1
8	11	1.1	0.8	1.1
8	12	1.4	0.6	1.3
7	9	0.8	0.6	1.5
8	12	0.6	0.8	1.2
7	8	1.4	0.7	1.1
7	12	1.3	0.8	1.4
7	12	1.1	1.1	1.3
8	13	0.8	0.7	1.1
8	9	1.4	1.1	1.3
8	11	1.2	0.7	1.1
8	14	2.3	0.7	1.2
7	9	2.1	1.1	1.2
7	8	2.1	1.1	1.3
8	10	1.2	0.7	1.2
8	8	1.1	0.9	1.4
7	10	2.3	1.1	1.4
8	12	1.1	0.6	1.2
7	9	0.7	0.8	1.2
7	7	1.2	0.8	1.3
8	12	1.1	0.9	1.1
7	8	1.2	1.1	1.2
7	12	2.1	1.2	1.1
7	12	1.3	0.8	1.2
8	13	0.8	0.7	1.1
7	8	1.4	1.1	1.3
7	12	1.2	0.7	1.1
7	11	2.3	0.7	1.2
8	11	2.1	1.1	1.2
8	11	1.4	1.2	1.4
7	8	0.8	0.9	1.2
7	11	0.7	1.2	1.4
7	11	1.1	1.2	1.2
8	11	3.1	1	1
8	11	2.1	1.1	1.1
8	12	1.1	0.8	1.1
7	9	1.4	0.6	1.3
8	11	2.1	1.1	1.1
7	11	1.4	0.6	1.3
7	8	1.1	0.8	1.1
7	9	1.4	1.1	1.3
7	7	1.2	0.7	1.1
8	12	2.3	0.7	1.2
7	8	2.1	1.1	1.2
7	12	1.4	1.2	1.4
7	12	0.8	0.9	1.2
8	13	0.7	1.2	1.4

7	8	1.1	1.2	1.2
7	12	3.1	1	1
8	11	1.1	0.8	1.1
7	11	2.1	1.1	1.1
8	6	3.6	1.2	1.2
7	8	1.2	0.7	1
7	7	1.2	0.80	1.2
7	9	3.4	1.2	1.1
8	10	1.4	1.1	1.2
7	8	1.4	1	1.2
7	7	1	0.9	1.2
9	16	2.4	1.2	1.7
8	11	1.2	1	1.6
7	8	1.2	1.1	1.1
7	11	1.6	1.4	1.6
8	10	1.2	1.6	1
8	12	0.8	1.2	1.4
7	11	1.2	2.1	1.2
8	10	1	0.9	1.4
8	12	2.1	1.2	1.9
8	11	1.2	1.1	1.8
8	10	1.3	1.9	1.2
9	9	6.2	0.4	1.7
7	8	1.2	1	1.2
7	7	1.6	1.4	1.6
7	10	11.2	0.6	1.4
7	9	1.4	1.3	1.4
7	21	9.2	0.8	1.8
7	18	1.7	0.8	2.6
7	13	19.2	5.6	1.7
7	10	20	3.6	2
7	12	20	3.4	1.3
7	10	1.5	1.2	1.8
7	11	45	1.1	1.9
7	13	2	0.9	1.4
8	10	1.5	0.6	1.2
8	12	8.2	0.7	1.3
8	10	1	2.3	1.1
9	9	7.8	1.4	1.2
8	12	1.1	1.4	1.6
10	15	6.8	1.4	1.6
7	7	6.36	0.8	1.1
9	9	8.7	1.8	1.5
8	20	23	2.6	1.9

Sex
Male 1

Female	2
Alcohol	
Present	1
Absent	2
HBV infection	
Present	1
Absent	2

Albumin 3 months	CTP 3 Months	MELD 3 month	Bilirubin 6 months	Creatinine 6 months
2.6	7	10	1.5	1.5
2.8	7	11	4.1	0.9
2.2	7	10	3.2	1.7
2.3	8	13	13.2	0.3
2.2	8	10	0.9	2.8
1.9	8	8	1.9	0.5
2.1	7	10	8.1	0.8
1.9	8	12	2	0.7
2.1	7	9	1.7	0.5
2.4	7	7	1.9	0.8
1.8	8	12	1.2	0.7
2.3	7	8	3.4	1.1
2.1	7	12	1.3	1.1
2.6	7	12	2.2	1
2.8	8	13	1	1
2.4	7	8	1	0.9
2.1	7	12	1	1.2
2.4	7	11	0.9	0.9
2.1	8	11	1.7	0.8
2.4	8	11	1.2	0.7
2.2	7	8	2.2	1
2.6	7	11	1	1
2.8	8	13	1	1
2.4	7	8	3.2	0.72
2.1	7	12	1.4	0.8
2.4	7	11	2.3	0.8
2.1	8	11	1.8	0.7
2.4	8	11	1.2	1
2.2	7	8	1.5	1.2
2.6	7	11	1.4	1
2	7	11	1.1	1.6
2.4	7	8	1.1	1.2
2.8	7	9	1.2	0.8
2.6	8	11	1.3	1.4
2.9	8	11	1.8	1.2
2.2	8	12	1	0.8
2.1	7	8	11.77	5.6
2.2	8	10	12.12	1.5
1.9	8	8	9.8	0.3
2.1	7	10	5.73	0.4
1.9	8	12	7.4	0.9
2.1	7	9	2.4	0.8
2.4	7	7	1.6	0.7
1.8	8	12	2.2	0.7
2.3	7	8	0.7	1.3
2.1	7	12	1.2	0.7
2.6	7	12	1.2	0.7
2.8	8	13	1.4	0.9
2.4	7	8	1.2	0.4
2.1	7	12	0.8	0.7

2.4	7	11	2.3	0.8
2.1	8	11	2	1.1
2.4	8	11	2.2	1.1
2.2	7	8	6.5	1.4
2.6	7	11	1.8	1
2	7	11	0.8	0.8
2.1	7	12	1.2	0.7
2.4	7	11	1.3	1
2.1	8	11	3.4	1.2
2.4	8	11	8.65	0.9
2.2	7	8	1.4	1
2.6	7	11	1	0.9
2	7	11	6	0.9
2.1	7	12	1.2	1
2.4	7	11	1.2	1.1
2.1	8	11	1	1.2
2.4	8	11	1.2	1.6
2.2	7	8	0.8	1.2
2.6	7	11	1.7	0.8
2	7	11	1	0.9
2.4	7	8	5.12	3.5
2.8	7	9	4	1.3
2.6	8	11	1.7	0.9
2.9	8	11	6.2	0.4
2.2	8	12	1.2	1
2.3	7	9	1.2	0.9
2.4	8	11	11.2	0.6
2.2	7	8	1.2	1.1
2.6	8	9	11.1	1.36
2.1	8	11	7	0.9
1.9	8	14	9.6	0.9
2.1	7	9	1.2	0.7
2.1	7	8	1.3	1
1.9	8	8	6.6	0.4
2.2	8	10	1.4	0.8
1.9	8	12	8.1	1.3
2.1	7	9	8.12	0.7
2.4	7	7	2.12	1.2
1.8	8	12	1	1.4
2.3	7	8	2	0.8
2.1	7	12	0.7	1.1
2.6	7	12	1.6	1.5
2.8	8	13	0.8	1.5
2.4	7	8	2	1.1
2.1	7	12	0.5	0.8
2.4	7	11	1.7	1
2.1	8	11	1.7	0.8
2.4	8	11	1	0.7
2.2	7	8	1.7	1.1
2.6	7	11	1.2	0.7
2.8	8	13	1	0.7

2.4	7	8	1	0.9
2.1	7	12	1.4	1
2.4	7	11	0.8	0.9
2.1	8	11	1.2	0.9
2.4	8	11	1.2	1.1
2.2	7	8	1.2	1
2.6	7	11	0.7	0.9
2	7	11	0.7	0.9
2.4	7	8	1.4	0.8
2.8	7	9	2.3	0.8
2.6	8	11	1.8	0.7
2.9	8	11	1.2	1
2.4	7	7	1.5	1.2
1.8	8	12	1.4	1
2.3	7	8	1.1	1.6
2.1	7	12	1.1	1.2
2.6	7	12	2.4	0.5
2.2	8	13	1.3	1
2.6	8	9	1.2	1.1
2.1	8	11	1.1	1.4
1.9	8	14	2.1	0.7
2.1	7	9	6.36	0.8
2.1	7	8	1	1.1
2.2	8	10	8.4	0.4
1.9	8	8	14.1	0.8
2.1	7	10	1.6	0.9
1.9	8	12	2.7	1.1
2.1	7	9	1.1	0.9
2.4	7	7	3.8	0.9
1.8	8	12	3.3	2.7
2.3	7	8	1.3	1
2.1	7	12	8.1	1
2.6	7	12	7.7	1.6
2.8	8	13	0.7	1.2
2.4	7	8	1	1.1
2.1	7	12	6.3	1.4
2.4	7	11	6.6	0.8
2.1	8	11	4	0.5
2.4	8	11	0.7	1
2.2	7	8	0.6	0.90
2.6	7	11	0.6	0.6
2.4	8	11	0.9	0.8
2.6	7	11	16.1	0.9
2.2	7	8	2.6	0.6
1.8	8	12	3.2	0.8
2.3	7	8	1.9	1
2.1	7	12	1	1.1
2.6	7	12	0.6	0.8
2.8	8	13	1.6	0.7
2.4	7	8	6.21	1.8
2.1	7	12	2	1

2.4	7	11	1.2	1.1
2.1	8	11	6.21	1.8
2.2	7	8	1	0.5
2.4	8	11	1.9	1
2.5	9	15	7.7	1.2
2.3	8	13	1.4	0.8
2.3	8	9	12.17	0.80
2.1	9	14	6	0.90
2.1	9	11	8.65	0.9
2.3	8	10	9.4	0.9
2.3	8	8	1.2	0.8
2.3	8	17	6	0.9
2.1	8	12	2.5	1.1
2	8	9	2.8	0.9
2.5	9	17	3.4	1.4
2.4	7	12	4.5	1.1
2.6	7	12	1.4	1.3
2	9	16	1.2	2.1
2.1	7	10	4.1	1.2
2.1	9	18	5.12	3.5
2.3	8	15	4	1.3
2.3	9	16	2.1	1.9
2.3	7	19	2.4	1.2
2.4	7	9	4	2.2
2.2	10	17	20	4.5
2.2	7	19	5.12	3.5
2.1	9	14	2.6	1.8
1.9	9	21	-	-
1.8	10	19	-	-
1.9	11	37	-	-
2.1	12	38	-	-
2.4	12	32	-	-
2.3	9	16	-	-
2.8	9	29	-	-
2.7	9	13	-	-
2.5	8	10	-	-
2.4	9	17	-	-
2.2	9	15	-	-
2.7	9	19	-	-
1.9	11	15	-	-
1.9	8	22	-	-
2.1	10	15	-	-
2.3	11	25	-	-
2.1	12	35	-	-

Others		variceal Bleed
Present	1	Present

Absent	2	Absent
Status on waiting list		HRS
Alive	1	Present
Died	2	Absent
HCV infection		
Present	1	
Absent	2	

INR 6 months	Albumin 6 month	CTP 6 month	ELD 6 mon	Status
2.2	1.9	12	21	1
1.9	1.8	12	19	1
1.2	1.9	9	18	1
1.9	1.9	11	24	1
1.1	2	10	17	1
1.7	2.1	9	15	1
1.1	2.1	9	15	1
1.6	2.3	8	14	1
1.7	2.3	8	14	1
1.4	2.1	8	13	1
1	2.1	8	13	1
1	2	8	12	1
1.4	2	8	12	1
1.2	2.2	8	12	1
1.2	2.3	7	11	1
1.5	2.4	7	11	1
1.3	2.3	7	11	1
1.4	2.6	7	10	1
1	2.4	7	8	1
0.9	2.4	7	7	1
1.2	2.2	8	12	1
1.2	2.3	7	11	1
1.2	2.4	8	11	1
1.4	1.9	10	15	1
1.2	2.3	7	10	1
1.3	2.6	7	13	1
1.1	2.6	7	10	1
1.6	2.4	7	12	1
1	2.1	7	10	1
1.3	2.5	7	11	1
1.2	2.4	7	13	1
1.1	2.2	8	10	1
1.4	2.3	7	11	1
1.3	2.4	7	14	1
1.4	1.8	9	14	1
1.2	2.2	7	8	1
2.9	1.8	12	41	1
1.3	1.9	9	23	1
1.7	1.9	11	21	1
1.2	2	10	16	1
1.1	2.1	9	15	1
1.2	2.1	9	12	1
1.4	2.3	8	12	1
1.2	2.3	8	11	1
1.2	2.1	8	11	1
1.3	2.1	8	10	1
1.2	2	8	10	1
1.2	2	8	10	1
1.3	2.2	8	10	1
1	2.3	7	6	1

1.1	2.4	7	11	1
2	2.3	9	27	1
2.1	2.6	7	19	1
1.7	2.4	7	23	1
1.2	2.4	7	11	1
1	2.2	8	6	1
1	2.3	7	13	1
1	2.4	7	7	1
1.1	2.1	9	14	1
1.8	2.1	9	21	1
1.2	2.3	8	10	1
1.2	2.3	8	8	1
1.7	2.1	9	19	1
1.6	2.1	8	12	1
1.1	2	8	9	1
1.3	2.3	7	11	1
1	2.4	7	12	1
1.4	2.6	7	12	1
1.2	2.4	7	11	1
1.4	2.1	7	10	1
1.2	2.5	8	27	1
1.7	2.4	7	20	1
1.2	2.2	8	10	1
1.7	2.3	7	19	1
1.2	2.4	7	9	1
1	1.8	7	7	1
1.4	2.2	7	19	1
1.1	2.2	7	9	1
1.3	2.3	7	21	1
1.5	2.4	7	18	1
1.5	2.1	9	20	1
1	2.1	7	7	1
1.3	2.3	8	10	1
1	2.1	8	13	1
1.1	2.3	8	9	1
1.4	1.8	9	21	1
1.5	2.1	9	19	1
1.3	2.1	8	14	1
1.5	2.5	7	14	1
1.5	2.4	7	14	1
1.1	2.2	7	8	1
1.1	2.3	8	13	1
1.3	2.4	7	13	1
1.1	2.1	8	11	1
1	2.2	7	6	1
1.1	2.3	7	10	1
1.2	2.4	7	10	1
1.4	2.6	7	10	1
1	2.4	7	9	1
1.2	2.1	7	9	1
1.2	2.5	7	8	1

1.1	2.4	7	7	1
1.1	2.2	8	9	1
1.2	2.3	7	8	1
1	2.4	7	7	1
1.1	1.8	9	9	1
1	2.2	7	7	1
1	2.2	8	6	1
1	2.3	7	6	1
1.2	2.3	7	10	1
1.3	2.4	7	13	1
1.1	2.6	7	10	1
1.6	2.4	7	12	1
1	2.1	7	10	1
1.3	2.5	7	11	1
1.2	2.4	7	13	1
1.1	2.2	8	10	1
1.2	1.9	12	12	1
1.3	1.8	12	10	1
1.1	1.9	9	9	1
1.6	1.9	11	15	1
1.7	2	10	15	1
1.1	2.1	9	15	1
1.2	2.1	9	9	1
1.6	1.8	8	20	1
1.2	2.3	8	18	1
1.1	2.1	8	9	1
1	2.1	8	11	1
1.9	2	8	12	1
1	2	8	11	1
1.1	2.2	8	22	1
1.3	2.3	7	10	1
1.5	2.4	7	19	1
1.3	2.3	7	22	1
1.1	2.6	7	9	1
1	2.4	7	6	1
3.1	2.1	9	29	1
1.6	2.2	8	19	1
1.8	2.3	7	18	1
1.3	2.4	7	9	1
1.2	2.4	7	8	1
1.1	2.3	8	7	1
1.5	2.1	8	11	1
1.2	1.9	10	19	1
1.2	2.4	7	12	1
1.4	2.1	7	15	1
1.4	2.4	7	14	1
1.6	2.1	8	13	1
1.2	2.4	8	9	1
1.1	2.2	7	14	1
1.5	2.1	8	23	1
1	2	7	9	1

1	2.4	7	8	1
1.5	2.1	8	23	1
1.2	2.9	7	8	1
1.4	2.6	8	14	1
1.7	2.5	10	22	2
1.1	2.1	7	9	2
1.8	2.3	11	22	2
1.7	2.3	10	19	2
1.8	2.1	9	21	2
2	2.1	10	23	2
1.4	2	8	11	2
1.7	2.1	9	19	2
1.8	2.6	8	17	2
1.5	2.3	8	15	2
1.7	2.5	10	20	2
1.8	1.9	9	20	2
1.4	1.9	9	14	2
1.7	2	10	20	2
1.9	2.1	10	21	2
1.2	2.5	8	27	2
1.7	2.4	7	20	2
1.5	2.3	10	20	2
2.1	2.1	9	20	2
1.7	2.4	11	25	2
1.9	2.2	12	38	2
1.2	2.5	11	27	2
2	2.1	12	23	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2
-	-	-	-	2

	SBP	
1	Present	1

2	Absent	2
	Hepatic encephalopathy	
1	Present	1
2	Absent	2

ABBREVIATIONS

CTP	: Child Turcotte Pugh Score
MELD	: Model for End Stage Liver Disease.
PELD	: Pediatric End Stage Liver Disease.
INR	: International Normalized Ratio
ICG	: Indocyanine Green
UNOS	: United Network for Organ Sharing
HBV	: Hepatitis B Virus
HCV	: Hepatitis C Virus
HIV	: Human Immunodeficiency Virus
ROC	: Receiver operating characteristic
PT	: Prothrombin time
HE	: Hepatic encephalopathy.
HRS	: Hepato renal syndrome.
SBP	: Spontaneous Bacterial Peritonitis.
MEGX	: Monoethylglycinexylidide
TNM	: Tumor Node Metastasis
APACHE	: Acute Physiology and Chronic Health and Evaluation
HCC	: Hepatocellular carcinoma.
TIPS	: Transjugular Intrahepatic Portosystemic Shunt.

PROFORMA

Name Age/Sex: …../….. MGE no: /….DOR …/…/…

Address Occupation ……. Income …….

BLOOD GROUP: Contact number

DIAGNOSIS:

……..

Chief complaints

Distension of Abdomen

Pedal Edema

HPI Duration…

Distension of Abdomen

Abdominal pain (RUQ)

Pedal edema

Fever

Jaundice

Loss of weight

Loss of appetite

Bleeding PR

PAST H/O DM/HT/TB/Abdominal surgery/others

Family h/o Cancer

Personal h/o Alcohol/Smoking/Tobacco

O/E

Signs of weight loss ……
Abdominal / pelvic mass ……..
Percussion for fluid. ……
Groin or neck nodes ……
PR mass/blood ……

Investigations

CBC
- Hb%
- TC
- DC
- ESR
- Platelets
- Prothrombin time: ……
- INR:

L F T
- S. Bilirubin T ….. /D ……
- SGOT /SGPT ……../……
- TOTAL Protein ……. / Alb….
- SAP ……

Blood
- Urea
- Sugar
- Creatinine
- Electrolytes

Ascitic fluid analysis
- Cell count
- Albumin
- Gram stain
- Culture

S. Amylase ……..
S. Lipase ……. .
AFP ……

Amylase
Cytology
Mycobacterial culture

CXR :
AXR :
USG Abdomen:

VIRAL MARKERS
HBsAg :
Anti HCV:

PV Doppler:

CTSCAN:

ENDOSCOPY:

	Base line	At 3 months	At 6months
Sr.Bilirubin.			
Sr. Creatinine.			
INR			
Albumin			
CTP			
MELD			