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Pediatric Chronic Liver Failure-Sequential Organ Failure Assessment Score and Outcome of Children with Chronic Liver Disease Admitted to Intensive Care Unit

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Abstract

Background: Chronic liver diseases (CLD) in children are a growing public health concerns, with potential long-term implications. When complications of CLD are severe, end stage liver disease (ESLD) often occurs and admission to the intensive care unit (ICU) is often required for organ support and management. For predicting the prognosis of end-stage liver disease, many prognostic models were proposed. Pediatric chronic liver failure-sequential organ failure assessment (pCLIF-SOFA) scoring system was formulated by European Association for the Study of the Liver-Chronic Liver Failure Consortium (EASL-CLIF) to predict mortality in ACLF patient.

Aim of Study: This study aimed to assess the predictive value of the pediatric CLIF-SOFA (pCLIF-SOFA) score in determining the outcome of children with chronic liver disease (CLD) admitted to the ICU.

Patients and Methods: A prospective study was conducted on 100 children with CLD admitted to the Pediatric Hepatology, Gastroenterology, and Nutrition Department, National Liver Institute, Menoufia University. Patients were divided into deceased and surviving groups based on the outcome.

Results: Various demographic and clinical characteristics were found among the patients, with pneumonia being the most common cause for admission to the ICU. The outcome showed no significant correlation with age and sex, but significant correlations were observed with various clinical parameters such as the general appearance, body temperature, pulse rate, and respiratory rate. Higher mortality rates were associated with certain clinical manifestations e.g. tachypnea, tachycardia, jaundice, hypotension, pallor and the need for mechanical ventilation, need for blood element transfusion and vasoactive drugs. The study also demonstrated a strong correlation between the severity of hepatic encephalopathy and mortality, as well as the benefit of using pediatric CLIF-SOFA score in predicting short-term outcomes compared to liver specific scores like the Pediatric End-Stage Liver Disease model (PELD) and The Model for End-Stage Liver Disease (MELD).

Conclusion: In conclusion, organ failure-based scoring systems like pediatric CLIF-SOFA are better predictor of short-term mortality in children with advanced CLD compared to PELD/MELD.

Key Words: *Chronic liver disease in children – CLIF – SOFA.*

Introduction

CHRONIC liver disease (CLD) involves a process of progressive destruction and regeneration of the liver parenchyma leading to fibrosis and cirrhosis. The spectrum of etiologies is broad for CLD, including toxic, infectious, autoimmune, genetic, and metabolic diseases. Cirrhosis is a final stage of CLD that disrupts liver architecture leading to formation of widespread nodules, vascular reorganization, neo-angiogenesis, and deposition of an extracellular matrix **[1].**

Complications of CLD include portal hypertension, variceal bleeding, ascites, spontaneous bacterial peritonitis, hepatorenal syndrome, hepatic encephalopathy, hepatopulmonary syndrome, por-

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topulmonary hypertension, cirrhotic cardiomyopathy, and malnutrition [2].

When these complications are severe, admission to the intensive care unit (ICU) is often required for organ support and management. Early aggressive treatment of infections, acute kidney injury, gastrointestinal bleeding, and encephalopathy can improve survival in patients with decompensated CLD [3].

Acute-on-chronic liver failure (ACLF) is a syndrome characterized by acute decompensation of CLD associated with multi-organ failure and high short-term mortality in two studies involving pediatric ACLF cases in two non-transplant centers, the 28-d and three-month mortality rates were reported to be 19.4% and 59%, respectively. In another study, the 28-d mortality and liver transplantation (LT) rates was reported to be 25% and 8.3%, respectively, which involves an acute precipitating event, such as infection. Extrahepatic complications often include renal, cardiovascular, and respiratory failure. Patients with ACLF usually need ICU admission for organ support [4].

Prognostic risk prediction models have been employed in the ICU setting since the 1980s and provide health care providers with vital information to help making decisions related to treatment and prognosis and compare outcomes across institutions. The ability to predict the course of a disease is an essential part of the assessment, enabling timely interventions that improve the outcome [5].

For predicting the prognosis of end-stage liver disease, many prognostic models were proposed. The Child-Pugh score has been the reference for assessing the prognosis of end-stage liver disease for about three decades. The Model for end-stage liver disease (MELD) score emerged as a “modern” alternative to the Child-Pugh score. A modified score including serum sodium, termed MELD-Na, has been proposed as an alternative to MELD score. The addition of Na to the MELD improves its predictive accuracy, especially for patients with lower range MELD scores [6].

Similar to the MELD score, the pediatric end-stage liver disease (PELD) score was used for age younger than 12 years, derived from biological markers of liver function (albumin level, bilirubin level, and international normalized ratio for prothrombin time) and growth failure. When MELD and PELD scores for both candidates are compared and an organ is allocated to the individual with the higher estimated 90-day probability of death. Consequently, MELD and PELD scores must accurately and comparably reflect the probability of 90-day pre transplant death [7].

The sequential organ failure assessment (SOFA) score has become integrated into a range of aspects of critical care since its development in early 1990, and it is now widely employed in the daily monitoring of acute morbidity in the ICU. The SOFA score was designed to provide population-level insight into the acute morbidity of ICU patients; it is now used as a key criterion in the diagnosis of sepsis syndrome on an individual patient level. It is also increasingly important tool in defining both the clinical condition of the individual patient and the response to therapies in the context of clinical trials. Standardisation between different assessors in widespread centres is key to detecting response to treatment if the SOFA score is to be used as an outcome in sepsis clinical trials [8].

The chronic liver failure-sequential organ failure assessment (CLIF-SOFA) scoring system was formulated by the EASL-CLIF Consortium to predict mortality in ACLF patients by addressing six functional failures (hepatic, renal, cerebral, coagulatory, circulatory, and respiratory). Also, Pediatric CLIF-SOFA was used to predict 28-day mortality in children with CLD [9].

Patients and Methods

This prospective study included 100 children with CLD who were recruited from the ICU of Pediatric Hepatology, Gastroenterology and Nutrition department, National Liver Institute, Menoufia University between December 2021 and February 2023. It should be noted that all children enrolled in the study had chronic liver diseases and were admitted to the intensive care unit based on independent medical criteria, with no involvement of the researcher in the admission decisions. The study was approved by the Research Ethical Committee of Menoufia University, National Liver Institute.

Patients were divided according to the outcome into two groups, survivors and deceased.

At the time of admission, these 100 children with CLD, underwent full history taking, thorough clinical examination, laboratory investigations, abdominal ultrasonography (U/S) and calculating Pediatric CLIF-SOFA and MELD/PELD scores. These children were followed daily by laboratory investigations and by calculating Pediatric CLIF-SOFA and MELD/PELD scores. These information were registered on the first day of admission, at 72h of admission, on the last day before death or before discharge.

Data were fed to the computer and analyzed using IBM SPSS software package version 25.0. (Armonk, NY: IBM Corp) (2) Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean and standard deviation. Significance of the obtained results was judged at the 5% level.

Results

The current study showed that the distribution of the studied group according to gender was as follows: 60 (60%) males and 40 (40%) females. Age ranged between 1 month and 17 years with a mean value of 3.40±4.36 years. The most common causes of admission were pneumonia 53(53%), encephalopathy 18%, ten percent were due to dehydration, 5% were due to upper GIT bleeding, 4% were due to hypoglycemia, 3% were due to shock, 2% were due to intractable vomiting or lower GIT bleeding. The least common causes were 1% due to either convulsions, post arrest or renal impairment (Fig. 1).

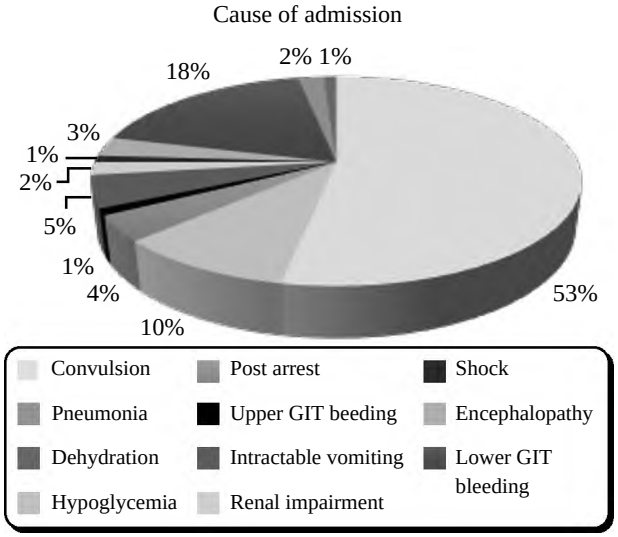

Fig. (1): Distribution of the studied cases according to the cause of admission.

According to the diagnosis of the disease, the most common diagnoses were progressive familial intrahepatic cholestasis (PFIC) 16%, neglected biliary atresia (BA) 15%, post Kasi 10%. Eight cases (8%) were autoimmune hepatitis, 7%were galactosemia, 5% were congenital hepatic fibrosis and 5% were glycogen storage disease (GSD). Undiagnosed neonatal cholestasis and CLD cases were 13% and 7% respectively (Fig. 2). According to clinical findings, 67% of the patients appeared well and 33% appeared ill, body temperature showed that 41% were feverish and 8% were hypothermic. Heart rate showed that 66% were tachycardic and one patient was bradycardic. Respiratory rate showed that 55% were tachypnic. Blood pressure showed that 32% were hypotensive and one patient was hypertensive. Eighty Eight (88%) of the cases had jaundice, 46% had pallor and 6% had cyanosis.

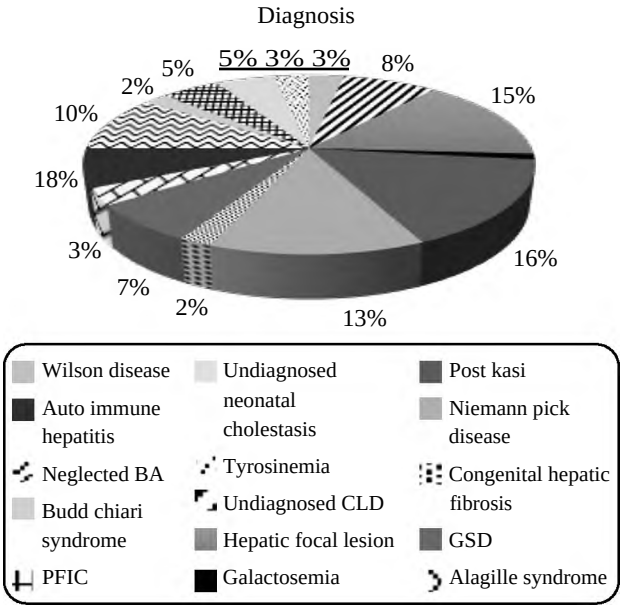

Fig. (2): Distribution of the studied cases according to the diagnosis.

Regarding thecauses of death in the deceased patients, the most common cause was Pneumonia 28 (48.28%). Fourteen cases (24.14%) died due to disseminated intravascular coagulopathy (DIC), 8 (13.79%) due to septic shock, 3 (5.17%) due to liver failure, 4 (6.9%) due to hypovolemic shock and 1 (1.72%) due to dilated cardiomyopathy (Fig. 3).

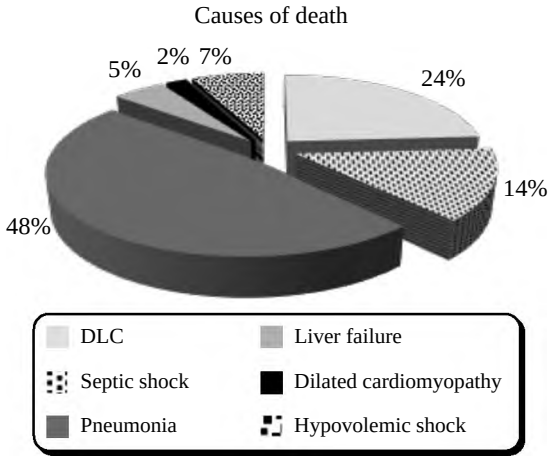

Fig. (3): Distribution of the deceased patients according to the causes of death.

Regarding to distribution of the studied patients according to outcome, where 58 (58%) deceases and 42 (42%) survived (Fig. 4).

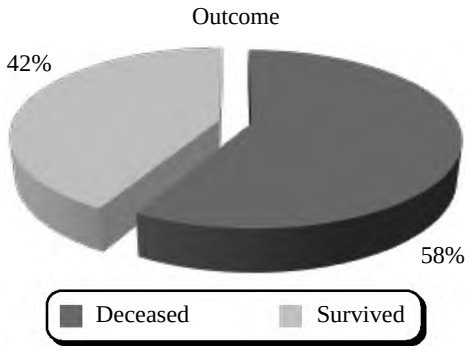

Fig. (4): Distribution of the studied cases according tooutcome.

Regarding the relation between demographic data and outcome in the studied patients, there was no association between outcome and sex but there was association between outcome and age. There was no significant difference between outcome and jaundice nor cyanosis. There was significantly different good negative correlation between outcome and general appearance, body temperature, heart rate, respiratory rate, blood pressure and pallor. There was no statistically significant difference nor correlation between outcome and hepatomegaly nor splenomegaly, while there was statistically significant difference and correlation between outcome and ascites, where fourteen cases who had ascites died while 0 survived, 44 of the died cases had no ascites. There was high statistically significant difference between outcome and chest manifestations, oxygenation method, need for vasoactive drugs, need for blood element transfusion and bleeding (p<0.001). There was a high statistically significantly different negative correlation between outcome and grades of hepatic encephalopathy and Galascow coma scale by Spearman's correlation test (Table 1).

Table (1): Distribution of the studied patients according to the grade of hepatic Encephalopathy and Galascow Coma Scale at presentation in relation to outcome.

Grades and scales	Outcome		p-value
	Deceased N=58	Survived N=42	
Hepatic Encephalopathy:			
No hepatic Enchephalopathy	9 (15%)	24 (57.1%)	<0.001*
Grade 1 hepatic encephalopathy	16 (27.6%)	10 (23.8%)	
Grade 2 hepatic encephalopathy	21 (36.2%)	3 (7.1%)	
Grade 3 hepatic encephalopathy	8 (13.8%)	5 (11.9%)	
Grade 4 hepatic encephalopathy	4 (6.9%)	0	
Spearman's correlation	r=0.402		p<0.001*
Galascow Coma Scale:			
15	3 (5.2%)	15 (35.7%)	
14	6 (10.3%)	7 (16.7%)	
13	4 (6.9%)	4 (9.5%)	
12	13 (22.4%)	9 (21.4%)	
11	11 (19%)	2 (4.8%)	
10	11 (19%)	1 (2.4%)	
9	5 (8.6%)	3 (7.1%)	
8	3 (5.2%	1 (2.4%)	
6	1 (1.7%)	0	
5	1 (1.7%)	0	
Spearman's correlation	r=0.423		p<0.001*

Regarding the relation between laboratory investigations and outcome, there was statistically significant difference between the studied patients regarding total & direct bilirubin after 72h of admission, total & direct bilirubin on last day, Alb after 72h of admission, Alb on last day, GGT after 72h of admission, urea on last day, WBCs on 1st day, WBCs on last day and Pao2/Fio2 after 72h of admission. While there was highly statistical significance between the studied patients regarding, T.Bil on 1st day of admission (mg/dl), D.Bil on 1st day (mg/dl), T.Protein on 1st day (g/dl), T.Protein on last day, PT on 1st day (seconds), PT after 72h of admission, PT on last day, INR after 72h of admission, INR on last day, Hb on 1st day (gm/dl) and PaO2/Fio2 on last day.

Regarding the sensitivity and specificity of PCLIF-SOFA score, PELD/MELD score on the first

and the last day of admission to PICU for prediction of outcome showed high significance in PCLIF-SOFA score ranged between 73.6% sensitivity, p=0.002 on the first day and 97.9%, p<0.001 on the last day. In PELD/MELD score, it ranged between 70.3% sensitivity, p=0.007 on the first day and 75.4%, p=0.001 on the last day proving that PCLIF-SOFA score is better than PELD/MELD score in prediction of outcome (Fig. 5).

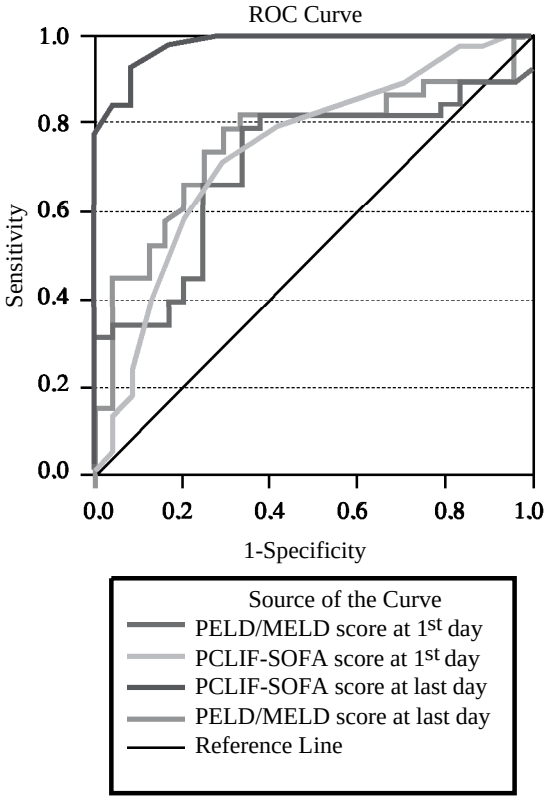

Fig. (5): Rock curve describing sensitivity and specificity of PCLIF-SOFA score, PELD/MELD score in prediction of outcome in Pediatric end stage liver disease.

Discussion

Chronic liver diseases in children represent a rising problem with significant effects on public health [10].

Acute-on-chronic liver failure is a presentation in approximately 10% of CLD cases in children with around 60% survival. ACLF is characterized by the acute deterioration of the liver functions due to the effects of a precipitating factor on the basis of a CLD. The most common of such diseases and acute events are autoimmune hepatitis, Wilson's disease, and their flares. ACLF is associated with a poor prognosis [11].

Accurate prognostic scores are needed to discriminate patients with poor outcomes from those who will recover spontaneously or with a specific treatment [12]. Numerous prognostic models have been investigated with varying success [13].

The aim of this study was to evaluate the role of Pediatric CLIF-SOFA score in predicting the outcome of children with CLD admitted to the ICU.

This study showed that:

There were 60% males & 40% female, also showed the mean age of children was 3.40±4.36 years. The current study showed distribution of the studied patients according to outcome, Where 58 (58%) deceased and 42% survived.

This study showed there was significantly different positive correlation between outcome and age, while there was no significant correlation between outcome and sex.

Comparable with the current study Ayoub et al., [13] enrolled 41 pediatric patients with Acute liver failure admitted to the National Liver Institute, Menoufia University, there were 22 (53.6%) males with age ranges from 0.2-16 years. The study reported a mortality rate of 25 (60.1%), moreover they found no association between mortality and age or sex.

With similar mortality rate, Bolia et al., [5] enrolled 110 children with decompensated chronic liver disease (DCLD). There were 74 (67.2%) males with age ranges from 0.3-17 years. The study reported a mortality rate of 37 (33.6%), moreover they found no association between mortality and age or sex.

The variation in mortality rate was attributed to the differences in severity of cases and the reason of ICU admission. Also, the high mortality rate in developing countries like Egypt may be related to the delayed access to care and the level of ICU.

The current study showed that the most common causes for admission to ICU were pneumonia 53 (53%), Encephalopathy 18%. The least common causes were 1% due to either convulsions, post arrest or renal impairment. Comparable with the current study, Zahmat Keshan, [14] enrolled 149 patients of CLD admitted to PICU. Among the participants. The most frequent causes of admissions were infectious diseases (22.1%). Frequencies of neurological, respiratory, cardiac, and endocrine disorders were 19.4%, 15%, 11.4%, and 10.7%, respectively.

The current study showed that the most common causes of liver disease were PFIC3 16 (16%), neglected BA 15% and post kasi 10%. Eight cases

8% were autoimmune hepatitis, 7 were galactosemia, 5 were congenital hepatic fibrosis or glycogen storage disease (GSD) & 3% were wilson disease. undiagnosed neonatal cholestasis and CLD cases were 13% and 7% respectively.

Bolia et al., [5] enrolled 110 children with DCLD reported that auto immune liver disease (AILD) (n = 22 [20%]) was the most common etiology of DCLD, followed by wilson's disease (19 [17.1%]). In 20 (18.1%) cases the etiology could not be identified and thus labeled as cryptogenic.

Several factors were identified as predictors of mortality among children with CLD admitted to the ICU. Regarding the relation between clinical findings and outcome, the current study showed that there was significant association between mortality and general appearance (severe illness and deeply comatosed), body temperature, respiratory rate, pulse rate, blood pressure and pallor. However, there was no significant association between outcome with neither jaundice nor cyanosis.

In line with the current study Ayoub et al., [13] showed that there was no statistically significant difference between survival and non-survival groups as regard jaundice and cyanosis. Furthermore, in agreement with the current study Kenzaka et al., [15] Showed by bivariate correlation analysis that all of the vital signs were correlated with the SOFA score. Furthermore, in agreement with the current study Bottaro et al., [16] showed that the pattern of skin temperature fluctuations predicts survival in patients with chronic liver disease.

Regarding the relation between abdominal findings and outcome, this study revealed that there was no significant association between outcome and abdominal findings (hepatomegaly, splenomegaly and ascites).

Bolia et al., [5] found no association between mortality and hepatomegaly or the presence of ascites among children with DCLD.

Also, Costa e Silva et al., [17] found no association between mortality and the presence of ascites among adult cirrhotic patients.

As regard the relation between complications and outcome, the current study revealed that there were significant association between outcome and chest manifestations, oxygenation method, need for vasoactive drugs, need for blood element transfusion and bleeding (p-value <0.001). But there was no significant association between outcome and cardiac complications.

Bolia et al., [5] revealed that the presence of organ failure was a significant risk factor for mortality among children with decompensated chronic liver disease. Also, our results were supported by Schulz et al., [18] who revealed that pulmonary failure and mechanical ventilation is associated with worse prognosis in ACLF patients.

Regarding the relation between outcome & hepatic encephalopathy grade and Galascow Coma Scale, the current study revealed that there was significant association between mortality and higher hepatic encephalopathy grade and lower Galascow Coma Scale (p<0.001).

Pop et al., [12] showed that the pediatrics with poor outcomes presented on admission day more frequently with hepatic encephalopathy than the survivors. Also, Bajaj et al., [19] showed that in an analysis of more than 1500 patients hospitalized for cirrhosis, HE of grade 3 or 4 was associated with higher 30-day mortality, independently of failure of other organs. Also in concordance with the current study Mao et al., [20] in a Systematic Review and Meta-analysis reported that severe hepatic encephalopathy (grade 3/4) was significantly associated with the poor outcomes in pediatric acute liver failure.

Regarding distribution of the deceased patients according to the cause of death in this study, the most common cause was Pneumonia 28 (48.28%), 14 (24.14%) were due to DIC, 8 (13.79%) were due to septic shock, 3 (5.17%) were due to liver failure, 4 (6.9%) were due to hypovolemic shock and 1 (1.72%) were due to dilated cardiomyopathy.

Costa e Silva et al., [17] reported that the most common cause of death among cirrhotic patients admitted to the intensive care unit was septic shock (70%) followed by ACLF (10%).

The current study showed that the duration of stay in ICU ranged between 1-18 days with mean value 6.30±2.94 days.

Comparable with the current study Costa e Silva et al., [17] revealed that the mean (SD) ICU and length of hospital stay were 6±6 and 15±12 days, respectively. However, Claude et al., [21] showed that the median [range] PICU stay was 13 [2–17] days. Moreover, Banc-Husu et al., [22] showed that the duration of intensive care unit stay was 13.1±1.2 days versus 0.6±0.6 days (p<0.001) and length of stay, 24.3±5.0 days versus 7.9±1.9 days (p=0.003) were longer in PACLF compared with non-PACLF.

In our study to test the prognostic validity of PCLIF-SOFA score, PELD/MELD score in prediction of outcome in pediatric end-stage liver disease (PELD), ROC curve analysis was performed revealing the sensitivity and specificity of PCLIF-SOFA score, PELD/MELD score in the first and the last day of admission in the PICU and showed high significance in PCLIF-SOFA score ranged between 73.6% sensitivity, (p=0.002) in the first day and 97.9%, (p<0.001) in the last day. In PELD/MELD score, it ranged between 70.3% sensitivity, in the first day and 75.4%, in the last day proving that PCLIF-SOFA score is better than PELD/MELD score in prediction of outcome in PELD.

The current study established that PCLIF-SOFA score at last day was the best predictor of outcome compared to PCLIF-SOFA score at admission and PELD/MELD score at admission and last day. In agreement with the current study Ayoub et al., 2020 showed that both pCLIF-SOFA and PELD/MELD scores >8 and >30 respectively on admission could predict death in children with ALF with the same sensitivity but with higher specificity than PPV, NPV and AUC for pCLIF-SOFA score.

Sanchez & D'Agostino, *[23]* reported that PELD/MELD score at a cutoff value of 33 can predict poor prognosis with a specificity of 81% and a sensitivity of 86%. Also, Rajanayagam et al., *[24]* found that PELD/MELD score at cutoffs >27 and >42 can predict death with sensitivity of 76% and 66% and specificity of 60% and 92%, respectively.

Moreover, Bolia et al., *[5]* showed that pCLIF-SOFA score of ≥11 identified 28-day mortality with a sensitivity of 94.9% and specificity of 91.5%. Also, Claude et al., *[21]* showed that a pCLIF-SOFA score of >9 was predictive of mortality within 28 days with a sensitivity of 87.8% and a specificity of 77.3%, while a pCLIF-SOFA score of >7 was associated with increased odds of liver transplantation on day-60.

In Conclusion: The current study showed that the pCLIF-SOFA score is better than the PELD/MELD score as a predictor of death in pediatric chronic liver failure and can be used for accurate selection of children with chronic liver failure who are in a real need of liver transplantation.

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درجة فشل الأعضاء المتسلسل (سوفا) والتنبؤ بحالة الأطفال المصابين بأمراض الكبد المزمنة والمحجوزين فى وحدة العناية المركزة

تمثل أمراض الكبد المزمنة لدى الأطفال مشكلة متزايدة لها آثار كبيرة على الصحة العامة. وفى الواقع فإن العديد من أمراض الكبد عند الأطفال هي مقدمة لاعتلال الكبد المزمن وتليف الكبد وسرطان الخلايا الكبدية لدى البالغين. ومدى انتشار أمراض الكبد لدى الأطفال غير معروف.

كان الهدف الرئيسى من هذه الدراسة هو تقييم دور درجة CLIF–SOFA للأطفال فى التنبؤ بنتائج الأطفال المصابين بمرض الكبد المزمن المقبولين فى وحدة العناية المركزة.

أجريت هذه الدراسة الاستباقية على ١٠٠ طفل مصاب بمرض الكبد المزمن، تم تقسيمهم إلى مجموعات متوفية وناجين، وتم تجنيد الحالات من وحدة العناية المركزة لأمراض الكبد لدى الأطفال، وأمراض الجهاز الهضمى، وقسم التغذية، بمعهد الكبد القومى، جامعة المنوفية.

وكانت النتائج الرئيسية لهذه الدراسة كما يلى:

– فى الدراسة الحالية، كان ٦٠ (٦٠٪) من المرضى من الذكور و ٤٠ (٤٠٪) من الإناث.

– تراوحت أعمار المرضى بين شهر واحد و١٧ سنة بمتوسط قيمة ٣,٤٠ ± ٤,٣٦سنة .

– وكانت الأسباب الأكثر شيوعاً بسبب الالتهاب الرئوى ٥٣ (٥٣٪)، واعتلال الدماغ ١٨ (١٨٪). ١٠٪ كانت بسبب الجفاف، و٥ (٥٪) كانت بسبب نزيف الجهاز الهضمى العلوى. ٤ (٤٪) كانت بسبب نقص السكر فى الدم، ٣ (٣٪) كانت بسبب الصدمة، ٢ (٢٪) كانت بسبب القىء المستعصى أو انخفاض نزيف الجهاز الهضمى. وكانت أقل الأسباب ١ (١٪) إما بسبب التشنجات أو ما بعد النوبة أو القصور الكلوى.

– وكانت التشخيصات الأكثر شيوعاً هى (16%) PFIC3 16، (15%) Neglected BA، (10%) Post Kasi 10. ثمانى حالات (١٠٪) كانت التهاب الكبد المناعى الذاتى، ٧ (٧٪) كانت الجالاكتوز فى الدم و ٥ (٥٪) كانت التليف الكبدى الخلقى أومرض تخزين الجليكوجن GSD. كانت حالات الركود الصفراوى الوليدى وحالات المصابين بمرض الكبد المزمن غير المشخصة ١٣ (١٣٪) و٧ (٧٪) على التوالى.

– أظهر المظهر العام أن ٦٧ (٦٧٪) كانوا يبدون بصحة جيدة و ٣٣ (٣٣٪) كانوا يبدون مرضى، وأظهرت درجة حرارة الجسم أن ٤١ (٤١٪) كانوا يعانون من الحمى و ٨ (٨٪) كانوا يعانون من انخفاض حرارة الجسم. أظهر معدل النبض أن ٦٦ (٦٦٪) كانوا يعانون من سرعة دقات القلب و ١ (١٪) كانوا بطيئين في ضربات القلب. أظهر معدل التنفس أن ٥٥ (٥٥٪) كانوا سريعى النفس. أظهر ضغط الدم أن ٣٢ (٣٢٪) كانوا يعانون من انخفاض ضغط الدم و ١ (١٪) يعانى من ارتفاع ضغط الدم. ثمانية وثمانون (٨٨٪) من الحالات مصابون باليرقان، ٤٦ (٤٦٪) مصابون بالشحوب و٦ (٦٪) مصابون بالزرقة.

– لم يكن هناك فرق ذو دلالة إحصائية بين النتائج والبيانات الديموغرافية مع العمر والجنس.

– كان هناك ارتباط إيجابى مختلف بشكل كبير بين النتيجة والعمر. في حين لم تكن هناك علاقة ذات دلالة إحصائية بين النتيجة والجنس.

– كان هناك فرق ذو دلالة إحصائية عالية بين النتيجة والمظهر العام مع (p = ٠,٠٠١) درجة حرارة الجسم (p = ٠,٠١٧)، النبض (p = ٠,٠١٧)، معدل التنفس (p = ٠,٠١٣)، (p = ٠,٠٠٦) Bl.P. والشحوب (p = ٠,٠٠١).

– لم يكن هناك فرق كبير بين النتيجة واليرقان أو الزرقة.

– كان هناك ارتباط سلبى جيد مختلف بشكل ملحوظ بين النتيجة والمظهر العام، ودرجة حرارة الجسم، ومعدل النبض، ومعدل التنفس، ونبض القلب. والشحوب.

– توفى ٤٥ (٧٧,٦٪) من حالات تضخم الكبد ونجا ٥ (١١,٩٪). نجت الحالة الأولى (٢,٤٪) التى كانت تعانى من انكماش الكبد، وتوفيت ٣٨ (٦٥,٥٪) حالة مصابة بتضخم الطحال ونجا ٢٥ (٢٩,٥٪). توفيت اثنتى عشرة حالة من الحالات التى كانت تعانى من الاستسقاء، بينما نجا ٣ (٢ حالة استسقاء متوسطة)، و٤٦ حالة من الحالات المصبوغة لا يوجد بها استسقاء.

– لم يكن هناك فروق ذات دلالة إحصائية ولا علاقة بين النتائج ونتائج البطن.

– عند فحص القلب، توفى ٩ (١٥,٥٪) نفخة ونجا ٥ (١١,٩٪)، وتوفى ١ (١,٧٪) بسبب قصور القلب ونجا الباقى.

– من بين المرضى، ٢١ (١٢٪) كانوا على الأكسجين وتوفوا. بينما نجا ٩ (٢١,٤٪)، وكان ٢٠ (٣٤,٥٪) على التنفس الصناعى وتوفوا. ٣٧ (٦٣,٨٪) احتاجوا إلى أدوية فعالة في الأوعية وتوفوا، بينما نجا ١ (٢,٤٪)، و٣٠ (٥١,٧٪) ممن احتاجوا إلى نقل الدم ومشتقاته ماتوا ونجا ٤ (٩,٥٪). توفى ٣١ (٣١٪) من النزيف ونجا ٦ (١٤,٣٪).

– كان هناك فروق ذات دلالة إحصائية عالية بين النتيجة والأعراض التنفسية، والاحتياج الى الأوكسجين بدرجاته المختلفة، والحاجة إلى الأدوية الفعالة فى الأوعية، والنزيف والحاجة إلى نقل عناصر الدم مع p <٠,٠٠١.