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Study on Relation of Serum Potassium with Severity of Child Pugh Score and Meld Score in Chronic Liver Disease Patients

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Abstract: ***Chronic liver disease CLD significantly impacts global morbidity and mortality, necessitating accurate prognosis to guide management, including liver transplantation. This study aims to explore the correlation between serum potassium levels and the severity of CLD as determined by the Child Pugh CTP and Model for End - Stage Liver Disease MELD scores. A cross - sectional analysis was conducted on 50 male patients with CLD at Justice KS Hegde Charitable Hospital from July 2020 to July 2022. The inclusion criteria included patients over 18 years with clinical and imaging - confirmed liver cirrhosis, excluding those on potassium - altering drugs, or with chronic kidney disease or malignancies. The Pearson correlation analysis was employed to assess the relationship between serum potassium and the CTP and MELD scores. The findings revealed a significant correlation $p < 0.05$, with higher serum potassium levels observed in patients classified as Child Pugh Class C and those with MELD scores above 30. This study underscores the importance of monitoring serum potassium in CLD patients, particularly those with severe disease, to anticipate and manage potential complications effectively.***

Keywords: chronic liver disease, serum potassium, Child Pugh score, MELD score, hyperkalemia

1. Background

- Chronic liver disease is a cause of significant morbidity and mortality all over the world.
- Therefore, identifying the prognosis is important in deciding future line of management including liver transplant.
- Various scoring systems have been developed for the same.
- Most commonly the Child Pugh score and MELD score are used to identify the prognosis in patients with chronic liver disease.
- There are very few studies which have studied the relation of serum potassium with severity of Child Pugh score and MELD score in CLD patients.

2. Aims and Objectives

1) To study the serum potassium of patients with chronic liver disease.
2) To determine the correlation between serum potassium and CTP and MELD.

3. Methods

- Cross sectional study on 50 patients of chronic liver disease treated at Justice KS Hegde Charitable Hospital between July 2020 to July 2022
- A written informed consent was taken from the obtained from the patients willing to participate in the study.

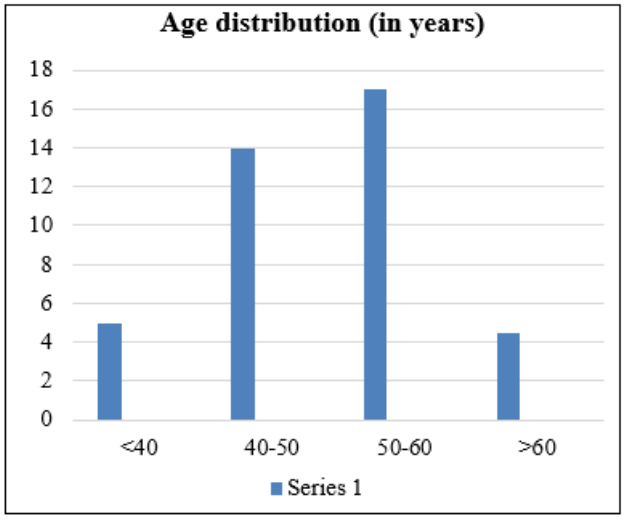
Inclusion Criteria:
Patients of liver cirrhosis above 18 years of age with stigmata of chronic liver cell failure on clinical examination and substantiated by imaging studies.

Exclusion Criteria:
1) Patients on drugs causing alterations in levels of serum potassium like ACE inhibitors, ARBs.
2) Patients who are known case of chronic kidney disease
3) Patients who are known case of malignancies
   - Data was tabulated in Microsoft Excel using SPSS for Windows.
   - Pearson correlation analysis was used for relationship between variables such as serum potassium and Child Pugh Score and MELD.
   - p value less than 0.05 was statistically significant.
   - MELD Score= 9.57 x loge (creatinine (mg/dl)) +3.78 x loge (total bilirubin (mg/dl)) + 11.20 x loge (INR) +0.643. MELD Na=MELD score - Na - 0.025 x MELD x (140 - Na) +140.
   - Child Pugh Score: Class A (score 5 - 6), Class B (score 7 - 9), Class C (score 10 - 15)

Parameter	Assign 1 point	Assign 2 points	Assign 3 points
Ascitis	Absent	Slight	Moderate
Bilirubin (mg/dL)	< 2	2-3	>3
Albumin (g/dL)	>3.5	2.8-3.5	<2.8
Prothrombin time (second over control) or INR	<4 <1.7	4-6 1.7-2.3	>6 >2.3
Encephalopathy	None	Grade 1-2 (Mild to moderate)	Grade 3-4 (Severe)

4. Results

- All of the patients in the study were males with chronic liver disease
- Majority of the patients (34%) belonged to 50 - 60 years age group
- 38% of the patients in the above study were in Child Pugh Class B followed by 34% in Child Pugh Class A and 28% in Child Pugh Class C.
- 92% of the patients in the above study had esophageal varices
- 56% of the patients in the above study had UGI bleed.
- 5% of the patients in above study had SBP
- 22% of the patients in the above study had hepatic encephalopathy.



- In the above chronic liver disease patients, the maximum potassium measured was 6.28 mmol/l and minimum potassium measured was 2.5 mmol/l with the mean potassium measured being 4.13 mmol/l.
- In the above patients, minimum MELD score was 6 and maximum MELD score was 35 with a mean MELD score of 19.
- Out of 50 patients, 14 (28%) were in Child Pugh Class C.
- In Child Pugh Class C majority of the patients had hyperkalemia with mean potassium being 5.3 mmol/l.
- Incidence of hyperkalemia was more in patients with MELD score more than 30 with average potassium of 5.1 mmol/l.

5. Conclusion

- In the above study most of the chronic liver disease patients who were classified as Child Pugh Class C were found to have hyperkalemia.
- The above study also shows that chronic liver disease patients with a MELD score above 30 had a high risk of developing hyperkalemia.
- From the above studies we can infer that in patients with chronic liver disease there is mostly positive correlation between serum potassium and Child Pugh Score and MELD score.

References

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