

# Serum Copeptin And Vitamin "D" In Patients with Acute on Chronic Liver Failure

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## Abstract

Acute-on-chronic liver failure (ACLF) is an increasingly recognized distinct disease entity that includes an acute deterioration of liver function in patients with chronic liver disease. It results in significantly higher short-term mortality than expected with patients with decompensated cirrhosis and the occurrence of organ(s) failure

Key words: ACLF; Chronic Liver

#### Introduction

Acute-on-chronic liver failure (ACLF) is an increasingly recognized distinct disease entity that includes an acute deterioration of liver function in patients with chronic liver disease. It results in significantly higher short-term mortality than expected with patients with decompensated cirrhosis and the occurrence of organ(s) failure [1].

Copeptin ( also known as the arginine-vasopressin (AVP) associated glycopeptide is the 39-amino acid C-terminal portion of the AVP precursor ( pro-vasopressin), co-secreted into blood by the hypothalamus in an equimolar ratio to AVP, its secretion is activated not only by changes in plasma osmolality and circulating blood volume, but also by stress and inflammatory states [2].

Its plasma concentration has been associated with mortality in several acute disease states [3].

Vitamin D is known for its function in calcium homeostasis and bone mineralization. However, it has numerous additional roles such as regulation of proliferation, apoptosis, differentiation and inflammation [4].

## Aim of the Work:

The aim of this work was to study the serum levels of copeptin, vitamin D (Vit D) and C-reactive protein (CRP) in patients with acute-on-chronic liver failure. Also, to correlate their level with:

- a) The severity of liver dysfunction using Child-Pugh and the MWLD-Na scores.
- b) The grade of ACLF.
- c) The severity of ACLF using CLIF-SOFA and CLIF-SOF-C ACLF scores.

## **Material**:

The present study included 70 patients with liver cirrhosis divided into two groups: Group I: 35 patients with ACLF including patients with previous compensated cirrhosis and patients with previous decompensated cirrhosis

Group II: 35 patients with compensated cirrhosis without ACLF.

Also, 20 age and sex matched healthy subjects with no evidence of liver disease were included in the study as a control group (Group III).

## **Methods:**

- 1- Clinical examination.
- 2- Laboratory investigations (complete blood picture, serum creatinine and blood urea, liver profile tests, serum Ns and K, CRP, serum copeptin, serum vitamin D.
- 3- The severity of liver disease was assessed according to the Child-Pugh and the MELD-Na scores.
- 4- The grading system of ACLF:

Grade 1: Patients with single organ failure.

Grade 2: Patients with two organ failure.

Grade 3: Patients with three orang failure or more.

5- The severity of ACLF was assessed by the use of CLIF-SOFA score and the CLIF-C score.

#### **Results:**

In this study, males predominated females in all the studied groups, variable presenting symptoms and signs of liver failure were more evident in patients with ACLF.

Although, anemia was present in cirrhotic patients with and without ACLF, thrombocytopenia and leukocytosis were more evident in patients with ACLV

In our study, serum creatinine and blood urea were significantly elevated in patients with ACLF. Also, hyponatremia and hyperkalemia were prevailing features in those patients.

In our study, there was high prevalence of patients with ACLF grade 3 followed by grade 2 and cerebral and renal failure were the most common organ failure observed in the groups.

In our study, infection was the most common precipitating factor for ACLF that vary from spontaneous bacterial peritonitis to urinary tract infection with bacteremia and pneumonia; while drug-induced liver injury and gastrointestinal bleeding were less frequent.

Both copeptin and CRP were significantly elevated in patients with ACLF in comparison to the other studied groups and there was significant positive correlation with the different calculated scores.

ON the other hand, vitamin D level was evidently low in patients with ACLF in comparison to other studied groups; in addition, it was negatively correlated with both CLIF-SOFA and CLIF-C scores.

In the present study CLIF-C score has been shown to be superior in predicting short-term mortality in ACLF patients with positive predictive value 90.4% and cut of value <59 when compared to other calculated scores.

Our results were in agreement with Cervoni JP et al and Weil D et al who stated that the value of CRP reflects the degree of systemic inflammation, regardless of its cause. [4,5] Also, Moreno JP et al, Kerbert AJ et al and Claria J concluded that elevation of copeptin level occurs in patients with ACLF due to hemodynamic derangement such as portal hypertension and decreased cardiac output. [6, 7, 8]

There was an agreement with the results of Arteh J et al and Trepo E et al in regarding low serum vitamin D in patients with ACLF; as vitamin D deficiency has a role in the generalized inflammatory system activation and deterioration of patients with cirrhosis. [9,10]

# Conclusion:

Infection is the most common precipitating factor for ACLF. Copeptin is an indirect marker of circulatory dysfunction, which increases significantly along with the severity of cirrhosis and ACLF. Also, it can be a promising predictor of mortality in these patients.

Sever vitamin D deficiency in patients with ACLF is related to high mortality rate and short-term survival.

CLIF-SOFA and CLIF-C scores are accurate predictors of high mortality and short-term survival.

# References

- 1. Wlodzimiro KA, Eslami S, Abu-Hanna A. (2013). A systemic review on prognostic indicators of acute-onchronic liver failure and their predictive value for mortality. Liver Int, 33: 40-52.
- 2. Katan M, Muller B, Christ M. (2008). Copeptin a new and promising diagnostic and prognostic marker. Crit Care; 12: 117.
- 3. Singer M, De Santis V, Vitale D. (2004). Multiorgan failure is an adaptive, endocrine-mediated, metabolic response to overwhelming systemic inflammation. Lancet, 364: 545-548.
- Cervoni JP, Amoros A, Moreau R. (2014). Prognostic value of C-reactive protein in patients with cirrhosis; external validation from the CANNON IC cohort. Hepatology, 60: 495-499.
- 5. Weil D, Ceroni JP, Muel E, Barbot O. (2012). C-reactive protein predicts short-term mortality in patients with cirrhosis. J Hepatol ,56: 1299-1304.
- Moreno JP, Grandelement E, Monnet E. (2013). Plasma copeptin, a possible prognostic marker in cirrhosis. Liver Int. 33: 843-8 51.
- 7. Kerbert AJ, Verbekel L, Chiang FW. (2015). Copeptin as an indicator of hemodynamic derangement and prognosis in liver cirrhosis. Polos One, 10: 138-142.
- Clarria J, Stauber RE, Coenraad MJ. (2016). Systemic inflammation in decompensated cirrhosis: characterization and role in acute-on-chronic liver failure. Hepatology, 64: 1249-1264.
- Artek J, Narra S. (2010). Prevalence of vitamin D deficiency in chronic liver disease. Dig Dis Sci, 55: 2624-28.
- TrepoE, Ouziel R, Paradet P, Geroy C. (2013). Marked 25hydroxyvitamin D deficiency is associated with poor prognosis in patients with alcoholic liver disease. J Hepatol 59: 344- 350.