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Decompensated Chronic Liver Disease Presenting As Microangiopathic Hemolytic Anemia: A Case Report

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Abstract

Anemia of diverse etiology is a common complication of chronic liver diseases. But, Microangiopathic hemolytic anemia is very rare in chronic liver disease. MAHA is a condition characterized by the destruction of red blood cells as they pass through small blood vessels, often due to abnormal blood vessel changes or clot formation within these vessels. Common causes of MAHA include conditions like thrombotic thrombocytopenic purpura (TTP), hemolytic-uremic syndrome (HUS), and disseminated intravascular coagulation (DIC)1. Microangiopathic Hemolytic Anemia (MAHA) is a mechanical hemolytic anemia characterized by the emergence of fragmented red cells in peripheral blood2. Here, we report a case of 65 -year old male with history of chronic alcoholism, presented with features of decompensatory liver disease and severe anemia.

Keywords: MAHA,Chronic Liver disease, Hemolytic Anemia

Introduction

Decompensated liver disease refers to the advanced stage of liver disease where the liver is no longer able to function properly. This can be due to various causes, such as chronic liver diseases like cirrhosis, hepatitis, or alcoholic liver disease. Decompensation means that the liver is struggling to perform its vital functions, which include detoxifying the blood, producing important proteins, and regulating various metabolic processes. Liver diseases are frequently associated with hematological abnormalities. Anemia of diverse etiology occurs in many of these liver disease patients[2]. Hemolytic anemias, especially microangiopathic hemolytic anemias are rare in liver diseases. The true incidence of MAHA among patients with alcoholic liver disease is not known.

Microangiopathic hemolytic anemia is a condition characterized by the breakdown of red blood cells (hemolysis) within the small blood vessels (microangiopathy). This condition can be caused by various underlying factors, including systemic diseases, infections, or medication side effects. MAHA is often associated with the presence of fragmented red blood cells (schistocytes) on a blood smear.

Case presentation

A 43-year-old male presented with fever and shortness of breath for 2 days, altered sensorium and decreased urine output for one day. He is a known case of chronic liver disease. On examination, the patient had severe pallor, icterus, generalised

oedema, tachypnoea and low oxygen saturation. Due to low GCS and low oxygen saturation patient was intubated. The liver and spleen were both palpably enlarged and firm, and ultrasound revealed coarse hepatic echotexture, suggesting chronic liver disease with ascites. Evidence of portal hypertension was not seen. On investigations, Haemoglobin was 5g/dl, platelet count was 69,000/µL, white blood cell count was 7500µL, and other investigations revealed total bilirubin level as 14 mg/dl with conjugated bilirubinaemia (7.8mg/dl) and unconjugated hyperbilirubinemia (6.2 mg/dl), elevated hepatic transaminases (alanine aminotransferase-155 IU/L, aspartate aminotransferase-56 IU/L), and hypoalbuminemia (2.5 g/dl). Kidney function test showed elevated levels of creatinine (2.4mg/dl)levels and decreased urinary output. The peripheral smear revealed severe anisopoikilocytosis, normocytes, microcytes, macrocytes, macro ovalocytes, polychromatophilic cells, nucleated red blood cells (165/100 WBCs), few micro spherocytes, and Schistocytes were seen(Figure1-A&B). Neutrophil showed a left shifted maturation. No atypical cells were seen. The corrected reticulocyte count was 8% (Figure1-C). Serum B12 and folate levels were normal. Coomb's test was negative. Ascitic fluid analysis revealed a total leukocyte count of 11,150 cells/mm^3 with 90% neutrophils. Cytology showed reactive mesothelial cells and numerous neutrophils. Adenosine deaminase levels were unremarkable, with acid-fast bacilli staining were negative for mycobacterium tuberculosis.

A clinical impression of decompensatory chronic liver disease with hepatic encephalopathy, hepatorenal syndrome, spontaneous bacterial peritonitis and microangiopathic hemolytic anemia were suggested. The patient was on admitted in ICU with ventilatory and ionotropic support due to poor respiratory and cardiac functions. The patient failed to respond to treatment and expired on the same day evening.

Discussion

MAHA can present with various systemic disorders including thrombotic thrombocytopenic purpura (TTP), hemolytic uremic syndrome (HUS), disseminated intravascular coagulation (DIC), systemic infections, and autoimmune disorders

Microangiopathic hemolytic anemia (MAHA) is a condition characterized by the destruction of red blood cells as they pass through small blood vessels, leading to a decrease in the number of functional red blood cells in circulation. Chronic liver disease is not a primary cause of MAHA, but it can be associated with MAHA under certain circumstances[3]. Here's how chronic liver disease can be related to MAHA:

1. Portal Hypertension: In advanced chronic liver disease, especially cirrhosis, increased pressure in the portal vein (portal hypertension) can lead to the development of collateral blood vessels in the gastrointestinal tract. These collateral vessels are fragile and prone to rupture, causing bleeding. When this bleeding occurs in the gastrointestinal tract, red blood cells can be damaged as they pass through these small vessels, leading to MAHA.
2. Coagulopathy: Chronic liver disease can result in impaired blood clotting (coagulopathy) due to a decrease in the production of clotting factors by the liver. As a result, individuals with chronic liver disease are at an increased risk of bleeding disorders, which can cause bleeding into the small blood vessels and lead to the destruction of red blood cells, contributing to MAHA.
3. Thrombocytopenia: Chronic liver disease can also cause a decrease in the number of platelets (thrombocytopenia), which are essential for proper blood clotting. When platelet counts are low, there is a higher risk of bleeding and microvascular damage, potentially contributing to MAHA.

It's important to note that while chronic liver disease can be associated with MAHA, it is not the primary cause of MAHA. MAHA is more commonly associated with other conditions, such as thrombotic microangiopathies like thrombotic thrombocytopenic purpura (TTP) and hemolytic-uremic syndrome (HUS), as well as certain infections, autoimmune disorders, and malignancies.

Decompensated liver disease and MAHA may occur if liver dysfunction leads to an imbalance in the production of clotting factors and proteins necessary for maintaining the integrity of blood vessels. This can result in a breakdown of red blood cells within the small blood vessels, leading to MAHA[4].

Conclusion

Volume 7, Issue 2; March-April 2024; Page No 316-318

Chronic liver disease can lead to various complications, and some of these complications may increase the risk of MAHA, but MAHA itself is not a common feature of chronic liver disease. The true incidence of MAHA among patients with alcoholic liver disease is not known. Even though there are lot of causes for anemia in liver disease, the possibility of hemolytic anemias should be considered if a patient presenting with low hemoglobin values. Peripheral smear examination is mandatory in all these cases of anemia for early identification and treatment.

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Figure 1

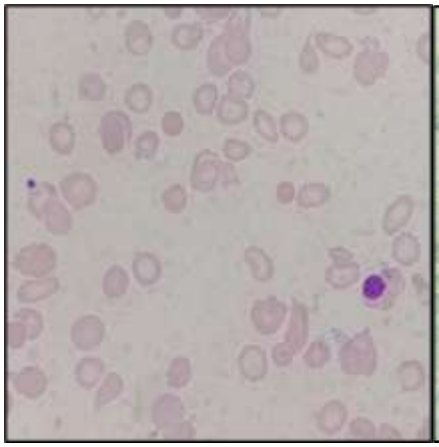


Figure 2

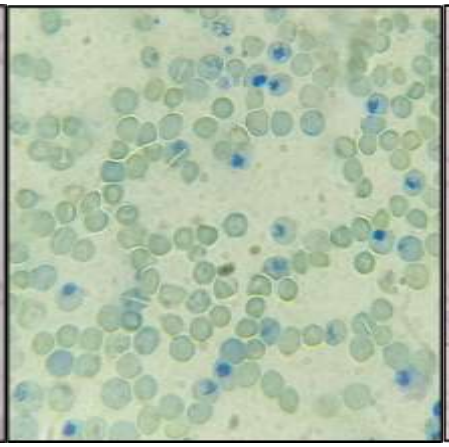
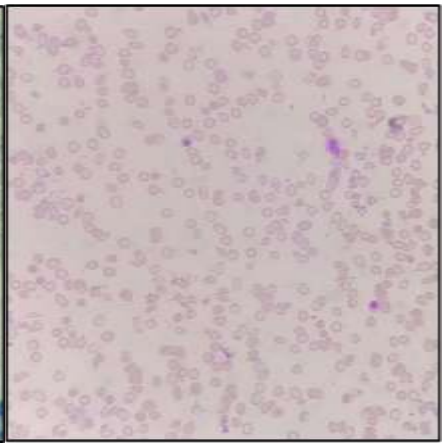


Figure 3



Volume 7, Issue 2; March-April 2024; Page No 316-318