CASE REPORT

Acute liver failure due to liver parenchymal infiltration with acute myelogenous leukaemia in a patient with myelodysplastic syndrome

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SUMMARY

Liver involvement by acute leukaemia is rare and has a high mortality rate despite treatment. We report a case of a 66-year-old woman undergoing treatment for myelodysplastic syndrome with Vidaza (azacitidine) who presented with abnormal liver function tests. Despite negative serologic testing and unremarkable abdominal MRI, she continued to have significant elevation in bilirubin and international normalised ratio and worsening mental status. Liver biopsy was obtained and consistent with acute myelogenous leukaemia. The patient had rapid demise due to acute liver failure and was unable to undergo treatment.

BACKGROUND

Involvement of the liver in haematological malignancies manifests as abnormal liver function tests, abnormal liver imaging typically with nodules on CT or MRI, or a clinical presentation of acute liver failure. Hepatic parenchymal infiltration in acute myelogenous leukaemia (AML) has rarely been reported despite AML being one of the most common acute leukaemias.¹ Previous literature suggested that if patients with AML develop acute liver failure, mortality rates are 1.9 times higher.² We report a case of liver infiltration by AML resulting in acute liver failure which is uncommon to the best of our knowledge.

CASE PRESENTATION

A 66-year-old woman with a medical history of cerebral vascular accident, diabetes mellitus type 2, hypertension and hyperlipidaemia was recently diagnosed with myelodysplastic syndrome (MDS) with refractory anaemia with excessive blasts (8% blasts) through a bone marrow biopsy 1 month prior to hospital admission. She was started on Vidaza (azacitidine) 2 weeks after diagnosis, which is a pyrimidine nucleoside analogue of cytidine and indicated as first-line treatment.³ She was admitted for workup of asymptomatic elevation of liver function tests on day 7 of treatment. Physical exam did not reveal any changes in mental status, hepatosplenomegaly or lymphadenopathy. Initial liver function tests showed total bilirubin/direct bilirubin: 3.4/1.7 mg/dL (reference range: <1.5 mg/dL/<0.5 mg/dL), alanine aminotransferase: 26 IU/mL (reference range: 9–48 U/L), aspartate aminotransferase: 38 IU/mL (reference

range: 14–40 U/L), alkaline phosphatase: 724 IU/mL (reference range: 32–126 U/L) and international normalised ratio (INR) of 1.2 (reference range: 0.9–1.1). Initial complete blood counts revealed white cell count: $3.1 \times 10^9/L$ (reference range: $4.5\text{--}11.0 \times 10^9/L$), haemoglobin: 8.6 g/dL (reference range: 11.7–15.5 g/dL) and platelets: $18 \times 10^9/L$ (reference range: $150\text{--}400 \times 10^9/L$). Serological tests for antinuclear antibody, antimitochondrial antibody, antismooth muscle antibody, plus acute and chronic viral hepatitis panel were negative. Abdominal MRI revealed coarse echotexture of liver with no features of cirrhosis, no features of cholelithiasis and normal appearing intrahepatic and extrahepatic biliary ducts. During the course of admission, she continued to have significant elevation in bilirubin and INR (figures 1 and 2) and worsening of mental status. Finally, a transcutaneous liver biopsy was performed that showed diffuse infiltration of liver with left shifted erythroid precursors and hepatocellular cholestasis in the absence of fibrosis. On immune histochemical staining, the mononuclear cell infiltrates were positive for D117+, CD235+ (large subset) and e-cadherin; while negative for CD3, CD31, CD34 and CD79a. Ki67 is positive in the majority of mononuclear cells (>95%) consistent with high proliferation fraction. These findings were consistent with AML infiltrating the liver parenchyma (figure 3). Bone marrow biopsy was performed; however, it was inconclusive due to a dry tap. Hospital course was complicated by liver failure, hepatic encephalopathy, coagulopathy and respiratory distress ultimately leading to rapid demise of the patient before treatment could be initiated for AML.

This case report was originally presented as a poster at the World Congress of Gastroenterology at American College of Gastroenterology Conference in October 2017.

DIFFERENTIAL DIAGNOSIS

1. Drug-induced liver injury.
2. Choledocholithiasis.

OUTCOME AND FOLLOW-UP

The patient was diagnosed with AML with liver parenchymal infiltration and expired before treatment could be initiated.

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Figure 1 Trend in liver function tests during hospitalisation. ALT, alanine aminotransferase; AST, aspartate aminotransferase.

DISCUSSION

This case illustrates a patient with acute liver failure in the setting of MDS that transformed into AML. Liver parenchymal infiltration due to AML is rarely reported in the literature. The majority of cases presented with cholestasis and obstructive jaundice⁴; however, few case reports have described a transaminitis without evidence of cholestasis.⁵ Previously reported patients with this diagnosis have been treated with cytarabine and anthracycline at the time of diagnosis but most patients only experience remission for a short period of time.⁴ Ultimately, this patient had a complicated 23-day admission. Infiltration of the liver with AML was included in the differential diagnosis for this patient and, given otherwise normal workup, prompted liver biopsy on day 16. Patient did not receive chemotherapy for AML given poor functional status and resulted in rapid demise 7 days after completion of biopsy. Mortality rates in patients with AML and liver infiltration have been reported to be high despite treatment.^{4,5}

This case emphasises the high mortality rate in patients with AML infiltration of the liver parenchyma and the limitation to

Figure 2 Trend in international normalised ratio (INR) during hospitalisation.

Figure 3 Liver biopsy showing diffuse sinusoidal infiltration by medium-sized mononuclear cells, consistent with left shifted erythroid precursors.

initiate chemotherapy due to aggressive course of disease, poor functional status and other comorbidities.

Learning points

- Involvement of liver in haematological malignancy is associated with very high mortality. This point should be discussed during counselling patient and family members.
- Acute myelogenous leukaemic involvement in the liver is a rare occurrence but should be considered in patients with myelodysplastic syndrome and abnormal liver function tests.
- Acute myelogenous leukaemia with parenchymal involvement should be promptly diagnosed in order to initiate treatment with chemotherapy given high mortality rates.

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REFERENCES

- 1 Deschler B, Lübbert M. Acute myeloid leukemia: epidemiology and etiology. *Cancer* 2006;107:2099–107.
- 2 Ho G, Jonas BA, Li Q, et al. Early mortality and complications in hospitalized adult Californians with acute myeloid leukaemia. *Br J Haematol* 2017;177:791–9.
- 3 Wells RA, Leber B, Zhu NY, et al. Optimizing outcomes with azacitidine: recommendations from Canadian centres of excellence. *Curr Oncol* 2014;21:44–50.
- 4 Goor Y, Goor O, Michalewicz R, et al. Acute myeloid leukemia presenting as obstructive jaundice. *J Clin Gastroenterol* 2002;34:485–6.
- 5 Mathews E, Laurie T, O'Riordan K, et al. Liver involvement with acute myeloid leukemia. *Case Rep Gastroenterol* 2008;2:121–4.

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