

Hepatitis: A Rare Complication of Influenza A Infection

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Introduction

Influenza affects millions of people annually. While generally influenza is associated with pulmonary disease, extrapulmonary complications are well-documented across many organ systems. However, the literature on influenza-induced hepatitis is relatively sparse and consists mainly of limited case reports¹⁻⁶. We describe a case of likely influenza-induced hepatitis in an otherwise healthy, young patient.

Clinical History

A 19-year-old female with no significant medical history presented to the emergency department after four days of fever, nausea, vomiting, and diarrhea. Laboratory findings were notable for mildly elevated aspartate transaminase (AST) and alanine transaminase (ALT) levels (Table 1). The patient endorsed taking 2-4g/day of oral acetaminophen for this acute illness AND chronically for relief from recurrent headaches. At this visit, the patient was counseled to limit acetaminophen intake and discharged home with supportive care instructions.

Two days later, the patient re-presented to the emergency department with complaints of weakness, chills, and tachycardia as well as continued nausea, vomiting, headaches, and fatigue. Repeat hepatic function tests showed markedly elevated liver function tests (Table 1., Figure 1.). Lactic acid was elevated. Toxicology labs including ethanol, acetaminophen and salicylate levels were obtained as was an infectious work-up. Notable findings were a positive Influenza A result and mildly elevated blood ethanol levels (Table 2.). The patient was transferred to ECUH-MC for further evaluation and treatment of severe, acute hepatitis in the MICU.

In the MICU, the patient received deferoxamine chelation therapy in addition to NAC therapy out of an abundance of caution. Further workup for autoimmune and infectious etiologies, Wilson's Disease, and hemochromatosis was performed. One copy of the C282Y gene was identified indicating hemochromatosis carrier status. Hepatitis panel, HIV, HSV, and CMV were negative (Table 2.). Gastroenterology was consulted who concluded that the patient's liver injury may have been related to acetaminophen use and recommended supportive care. The patient's LFTs improved and she was discharged home. Follow up at three weeks and six months showed normal LFT values (Figure 1., Table 1.).

Labs and Results

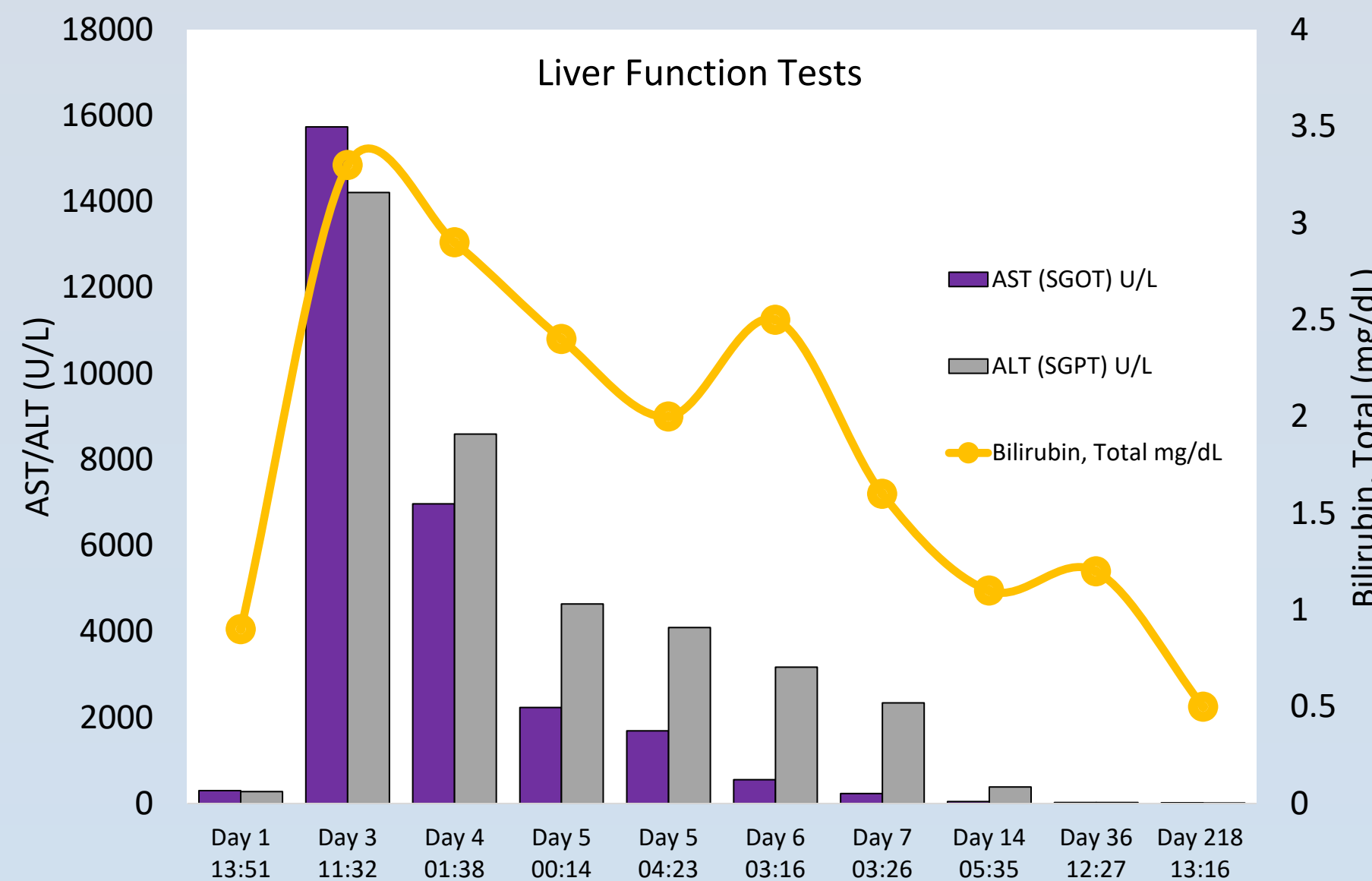


Figure 1. Trend of Liver Function Tests over time. AST/ALT on left vertical axis and Total Bilirubin on right vertical axis

	Day 1 13:51	Day 3 11:32	Day 3 22:31	Day 4 01:38	Day 5 00:14	Day 5 04:23	Day 6 03:16	Day 7 03:26	Day 14 05:35	Day 36 12:27	Day 218 13:16
Bilirubin, Total mg/dL	0.9	3.3		2.9	2.4	2	2.5	1.6	1.1	1.2	0.5
AST (SGOT) U/L	302	15,739		6,973	2,235	1,693	556	233	46	25	17
ALT (SGPT) U/L	281	14,213		8,596	4,645	4,094	3,175	2,345	384	24	14
Ferritin ng/mL			40,000			40,000				263	61
Ceruloplasmin				23.6							

Table 1. Liver Function Tests Trend.

Test	Result	Test	Result	Test	Result
Hepatitis Ab A/B/C	Negative	HSV	Negative	Ethanol	21mg/dL
HIV Ab	Negative	CMV	Negative	Acetaminophen	<1.0 µg/mL
				Salicylate	67µg/mL

Table 2. Infectious workup including Cytomegalovirus (CMV), Herpes Simplex Virus (HSV), Hepatitis, Human Immunodeficiency Virus (HIV) and Toxicology Results (Ethanol, Acetaminophen and Salicylate levels)

Discussion

- Acetaminophen overdose was considered:
 - Despite reported chronic acetaminophen ingestion for headaches, this patient denied use of more than the daily maximum of 4g in 24h⁷⁻⁸.
- Other Toxicologic Considerations (Table 2.):
 - Ethanol slightly elevated
 - Salicylate levels
 - These levels were not significantly elevated enough to explain the anomalous AST/ALT, Ferritin, and Total Bilirubin levels seen in this patient. However, acute/chronic alcohol use was considered as an etiology and cannot be fully excluded.
- Aside from being a carrier for hemochromatosis, other etiologies of hepatitis including Wilson's disease, and infectious hepatitis (Hepatitis A/B/C, HIV, HSV, and CMV) were ruled out.
- As the patient had no other medical history, influenza was deemed to be the likely etiology of her hepatitis.
- While rare, Influenza related hepatitis has been reported in the literature and pathologic data has shown isolation of viral particles from hepatic endothelial cells, sinusoidal epithelial cells, and hepatic macrophages⁹. Additionally, influenza virus has been isolated and cultured from the liver of a patient who died from acute influenza A infection¹⁰.
- This case re-iterates and contributes to data on the diverse manifestations of influenza and its potential impact on the entire body, not just the respiratory system.

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