CONJUGATED LINOLEIC ACID (CLA), COLLAGEN AND HYALURONIC ACID BASED WEIGHT LOSS SUPPLEMENT INDUCES HEPATOTOXICITY: A CASE REPORT

Alexandra Stroia, Emily Converse, Amlish Gondal, MD, Shri Jai Kirshan Ravi, MD, Matthew Lincoln, DO, FACG

Guthrie Robert Packer Hospital - Department of Gastroenterology

Background

Drug-induced liver injury (DILI) has been a growing concern as many unregulated products are becoming more readily available online and in stores. A 2008 survey of adults making a serious attempt at weight loss showed 33.9% of participants used dietary weight loss supplements.[1] Data from the Drug-Induced Liver Injury Network shows there has been a 7% to 20% increase in drug-induced liver injury attributed to the use of herbal and dietary supplements from 2004-2013.[2] Despite these alarming statistics, the data on what dietary supplements are causing liver injury, and the frequency or severity of the DILI, remains a minute area of research.

Patient Presentation

A 54-year-old obese female with a past medical history of hypertension and chronic lower back pain with no history of prior hospitalizations presented with a two-day history of 8/10 back pain, epigastric pain, nausea, and one episode of nonbilious emesis. She had taken acetaminophen the day prior for relief of pain. Current medications included furosemide, hydrochlorothiazide, methocarbamol, baclofen, acetaminophen, and an OTC weight-loss supplement. Social history revealed she was a current smoker and drank alcohol occasionally, however denied recreational drugs. The patient denied fever, sore throat, cough, SOB, chest pain, bruising, urinary symptoms, recent travel, or history of transfusions. Physical exam was remarkable for epigastric pain with normal bowel sounds and no organomegaly. Her back pain was positional, and bilateral in the paraspinal region. Patient was afebrile with a blood pressure of 227/106 with remainder of vitals stable.

Results

Platelet count, INR, creatinine, and albumin were within normal limits.

Abnormal labs are listed in *Table 1* below.

Six hours later up trending labs can be seen in *Figure 1*.

CT scan with contrast of abdomen and pelvis showed an anterior mediastinal mass and punctate calcification in the cystic duct.

Magnetic resonance cholangiopancreatography (MRCP) showed normal intrahepatic bile ducts, common bile duct, and pancreatic duct.

Table 1: Initial Admission Abnormal Labs

Aspartate aminotransferase (AST)	579 U/L (nl < 32 U/L)
Alanine aminotransferase (ALT)	428 U/L (nl 5-33 U/L)
Alkaline phosphatase (ALP)	363 U/L (nl 35-104 U/L)
Total bilirubin (TBili)	1.8 mg/dL (nl <1.1 MG/DL)
Gamma-glutamyl transferase (GGT)	397 U/L (nl 9-48 U/L)
Ferritin	943 ng/mL (nl 13—150 NG/ML)

Table 1: This table contains the first initial abnormal labs received in the emergency room setting based on standard lab references values at Guthrie Robert Packer Hospital. Liver enzymes were trended during inpatient stay.

Figure 1: Trend of Liver Enzymes in the Hospital

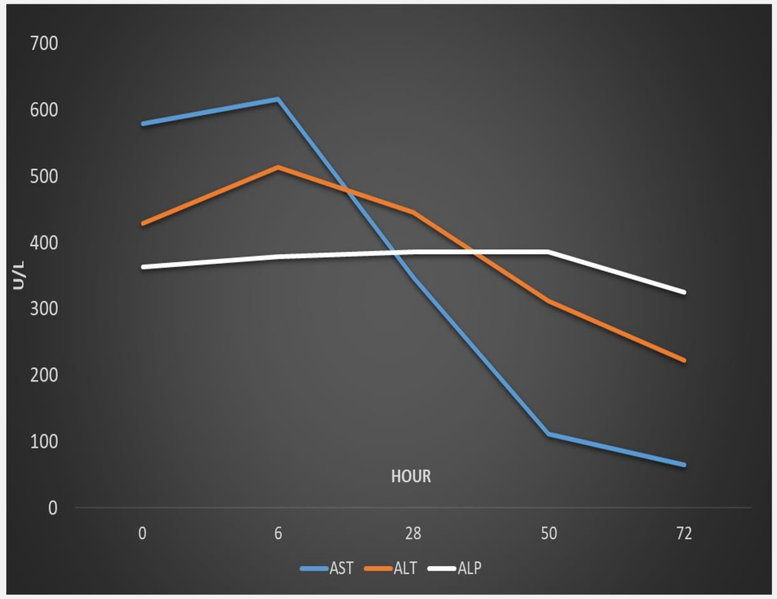

Figure 1: The y-axis represents the serum value of aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP) in units per liter. The x-axis is the approximate hour at which the data was collected. Outpatient values on the ninth day are not reported in the graph, but in the final diagnosis section.

For additional information please contact: astroia79955@med.lecom.edu

Differential and Diagnosis

Differential Diagnosis

1. *Viral Hepatitis*
   - A. Serologies for Hepatitis A, B and C were non-reactive
   - B. CMV IgM antibodies and EBV capsid IgM antibodies were negative
2. *Hepatotoxicity*
   - A. Acetaminophen level low
3. *Autoimmune hepatitis*
   - A. Positive ANA with titration of 1:40
   - B. Anti-mitochondrial antibody, anti-smooth muscle antibody and anti-liver-kidney microsomal antibody negative
4. *Hemochromatosis*
   1. Elevated ferritin (*table 1*)
   2. Serum iron was 74 mcg/dL

Final Diagnosis

Drug-Induced Liver Injury(DILID) from weight loss supplement. This was based on ruling out of other conditions, patient presentation, and improvement of liver enzymes after stopping the offending agent. The outpatient labs nine days after initial presentation to the Emergency Room were the following: AST = 15 U/L, ALT = 39 U/L, ALP = 208 U/L and Tbili = 0.30 mg/dL after discontinuation of the weight loss supplement.

Discussion and Conclusion

The lack of clinical information on adverse effects of over-the-counter weight loss supplements lead to the complexity of this clinical case. The FDA's Adverse Event Reporting System relies on consumers or providers to report supplements, with little regulation.[3] A study performed in 2019 that assayed 272 dietary supplement products revealed that more than half had chemical contents that did not match their label.[4] This weight loss supplement contained CLA, collagen, and hyaluronic acid. One study utilizing knockout mice demonstrated CLA can lead to liver fatty acid synthesis, hepatic steatosis, and hypertrophy. There are no current studies documenting adverse effects of collagen or hyaluronic acid, although one study demonstrates potential use of hyaluronic acid as a biomarker.[5]

References

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