# Autoimmune Hepatitis-Like Syndrome After Coronavirus Disease 2019 Vaccine

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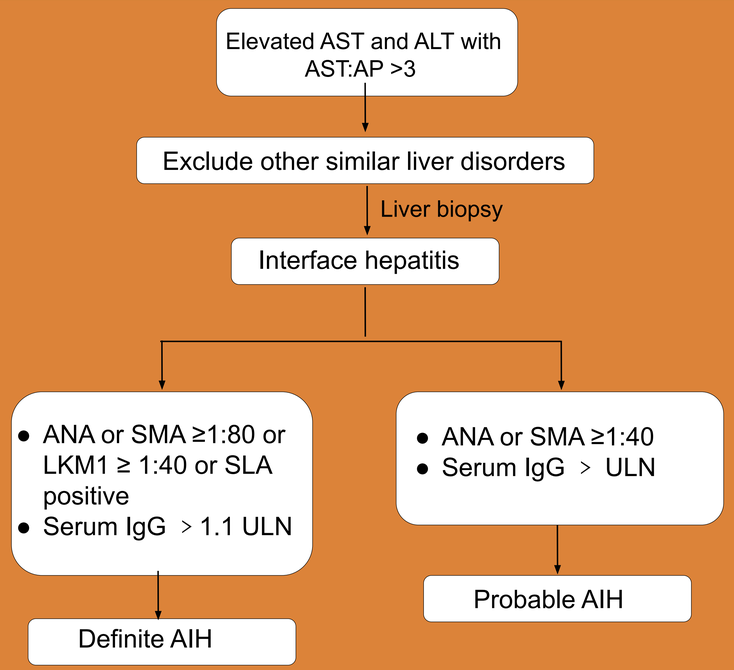
## Introduction

The rise of the coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has brought a wave of devastation, resulting in six million deaths worldwide. The impact of COVID-19 prompted the rapid development of anti-COVID vaccines: mRNA vaccines BNTb262 and mRNA-1273. A wide range of autoimmune diseases are increasingly being reported following COVID-19 vaccination. During summer of 2021, case reports of patients who developed autoimmune hepatitis (AIH)-like syndrome after receiving COVID-19 vaccination began to emerge. COVID-19 vaccine-induced AIH is extremely rare. In a systematic review by Chow et al., only 32 cases have been documented in the literature with 17 cases in the United States. Here, we describe a case of autoimmune hepatitis in a patient following the mRNA-1273 SARS-CoV-2 vaccine.

## Figure 1: Diagnostic Algorithm for AIH




## Case Report

A 56 year-old female received her second dose of the mRNA-1273 SARS-CoV-2 vaccine on the 29th of April 2021. She was in her usual state of health until one week post-vaccination when she developed severe fatigue, myalgia, and arthralgia. Subsequently one month post-vaccination, she noted jaundice, upper abdominal discomfort, and dark urine. Her medical history included depression for which she was on sertraline 25mg/day. She did not take herbal remedies or other drugs, and she does not consume alcohol regularly. Her exam was notable for jaundice and right upper quadrant tenderness.

Laboratory studies:

- **AST 1377 U/L**
- **ALT 2035 U/L**
- **Alkaline phosphatase 435 U/L**
- **Total bilirubin 3.8 mg/dL**
- Hep C Ab Non-Reactive
- Hep B Surface Ag and Hep B Core Ab Non-Reactive
- Hep A IgM Ab Non-Reactive
- Anti-Mitochondrial Antibody Negative
- Hemochromatosis C282Y Negative
- **ANA 1:320; Homogenous pattern**
- Anti-Smooth Ab Negative
- Alpha-1-Antitrypsin 151 mg/dL
- EBV Serology Negative
- Anti-Liver-Kidney Microsomal Microsome Type 1 Antibody Negative

CT abdomen and pelvis showed slightly decreased attenuation of the liver, consistent with fatty change. No focal liver lesion identified. The patient underwent liver biopsy which showed a portal-based chronic hepatitis with a resolving acute component. There was lobular inflammation composed predominantly of lymphocytes with focally prominent plasma cells and ceroid-laden macrophages. The pattern of liver injury on histology was compatible with AIH. She was started on budesonide 9 mg/day with progressive improvement in her liver function tests.

## Discussion

- AIH is an immune-mediated liver disorder. While the pathogenesis of AIH is elusive, it is thought to stem from loss of tolerance to hepatocyte-specific autoantigens through molecular mimicry or bystander activation in genetically susceptible individuals.
- Although casualty of COVID-19 vaccine leading to AIH cannot be confirmed, there are numerous findings in our case that suggest the patient presentation is not merely a coincidence.
- Given favorable outcome with treatment, clinicians should be vigilant for vaccine-induced AIH in patients who received vaccination and present with jaundice and abdominal pain in the setting of elevated liver enzymes.
- Despite association of autoimmune diseases with COVID-19 vaccines, the overall scientific consensus remains that the benefit of vaccination outweigh the risks.

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