New Drugs and New Toxicities: Liraglutide-Induced Liver Injury

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Introduction

Liraglutide is a glucagon-like peptide-1 (GLP-1) receptor agonist. It has demonstrated efficacy as an antidiabetic and anti-obesity drug. However, several common adverse events have also been reported, including nausea, vomiting, loose stools, and rarely pancreatitis. To our knowledge, this report represents only the third case of drug-induced liver injury (DILI) after the use of liraglutide.

Case Descriptions/Methods

A 43-year-old obese female was initiated on liraglutide 3 months ago for poorly controlled diabetes mellitus (HbA1c: 10.7%). She developed dull, right upper abdominal pain for 12 days. It was associated with fatigue and appetite loss. The patient was a nonsmoker, nonalcoholic, and drug-free. She did not take any over-the-counter or herbal supplements. Before liraglutide initiation, her LFTs were within normal ranges. Physical examination revealed tenderness in the upper abdomen. Laboratory studies revealed elevated levels of serum ALT, AST, ALP, total bilirubin, and INR **(Table 1).** The R ratio was 10.73, indicating a category 2 – moderate hepatocellular injury. Ultrasonography of the abdomen revealed fatty changes in the liver, but ruled out biliary abnormalities. The workup for viral hepatitis (A, B, C, D, and E), cytomegalovirus, and Epstein-Barr virus were all negative. The investigations for autoimmune disorders, hemochromatosis, Wilson's disease, and alpha-1 antitrypsin deficiency were also negative. After exclusion of probable causes, the patient was diagnosed with liraglutide-induced DILI. Liraglutide was immediately discontinued and N-acetylcysteine was administered. The clinical response was excellent, with resolution of symptoms in 4 days. Her LFTs also showed a downward trend. At discharge, her ALT 586 U/L, AST 115 U/L, ALP 258 U/L, and total bilirubin was 1.1 mg/dL. At the follow-up visit after 3 months, her LFTs were within normal limits.

Table 1: Laboratory studies with respective reference limits

Laboratory parameter	Patient value	Reference range
Alanine aminotransferase	1837	19-25 IU/L
Aspartate aminotransferase	1062	9-32 IU/L
Alkaline phosphatase	373	44-147 U/L
Total bilirubin	1.8	0.1-1.2 mg/dL
INR	1.0	<1.1
Lipase	234	23-300 IU/L
White cell count	8.4 x 10^9	4.0-11.0 x 10^9/L
Platelet count	196 x 10^9	150-450 x 10^9/L
Triglycerides	168	10-150 mg/dL
Total protein	7.3	6.3-8.5 mg/dL
Hemoglobin	13.6	12.0-15.5 g/dL
Creatinine	1.1	0.6-1.3 mg/dL
Hemoglobin A1c	10.7	≤6.5%
TSH	3.51	0.4-4.0 mIU/L
Corrected calcium	8.3	8.5-10.3 mg/dL

Discussion

Liraglutide-induced DILI remains an extremely rare adverse drug reaction. In our patient, the temporal relationship between DILI onset with liraglutide initiation and resolution of DILI with drug cessation suggested liraglutide-related DILI. On literature review, we found only 2 previously reported case reports. As in our case, the clinical outcomes in both cases were good and the patients recovered without any complications. Liraglutide is a safe drug, but patients should be monitored for newer adverse events like DILI. Prompt detection and drug cessation may spare patients from potential morbidity.

Table 1

Table 1. Laboratory data of the patient at the time of initial presentation.