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DOI: 10.17235/reed.2023.9628/2023
Link: PubMed (Epub ahead of print)

Please cite this article as:

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Macro-AST as a cause of hypertransaminasemia: an uncommon entity but it exists

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Conflict of interest: the authors declare no conflict of interest.

Keywords: Macro-AST. Macroenzymes. Hypertransaminasemia.

Dear Editor,

Macronzymes are complexes formed by the binding of enzyme molecules to each other or to other plasma components, such as immunoglobulins or proteins. Their high molecular weight leads to reduced renal clearance, which translates into a false elevation of plasma levels of the enzyme involved (1).

Case report

A 72-year-old female with a history of stage 1 chronic kidney disease was referred to our Liver Unit in April 2021 due to abnormal liver function tests. The patient was not taking chronic medication and denied consuming alcohol or other toxic substances. Clinically, she was asymptomatic and the physical examination was normal. Laboratory tests showed isolated elevation of aspartate aminotransferase (AST), at least since August 2020, with normality of the rest of liver and muscle enzymes (AST 183 IU/ml, alanine aminotransferase [ALT] 11 IU/ml, alkaline phosphatase [ALP] 68 IU/ml, γ-glutamyl transferase [GGT] 12 IU/ml, total bilirubin [BT] < 1 mg/dl, creatine kinase [CK] 35 U/l and lactate dehydrogenase [LDH]
145 U/l). The etiological studies (serology, thyroid hormones, ceruloplasmin and alpha-1-antitrypsin) were negative, except for the determination of antinuclear antibodies (ANA) titer of 1/640 spotted pattern and 1/1,280 MID-BODY pattern, with quantification of immunoglobulin G within the normal range. Abdominal ultrasound showed a steatotic liver with no other signs of liver disease. In successive laboratory tests, an isolated and persistent elevation of AST was observed. In the absence of hepatic and muscular causes, to rule out the presence of macro-AST, the patient’s serum was precipitated with a 25% polyethylene glycol (PEG) 6,000 solution at a ratio of 1:1 (in a 1:1 ratio). Subsequently, the sample was centrifuged at 2,000 g for 20 minutes, determining the AST activity in the supernatant, obtaining a percentage recovery of AST activity after precipitation with PEG of 3%. These results indicated the presence of macro-AST and an elevation of AST associated with it.

Discussion
The presence of macro-AST is a rare clinical condition with a benign course (2). The most widely used laboratory methods for its detection are ultracentrifugation, gel filtration chromatography and PEG precipitation, the latter being considered as a simple, accessible and low-cost technique (3). Macro-AST should be considered in the differential diagnosis as a cause of an isolated AST elevation (4), thus avoiding unnecessary additional tests, which are expensive and potentially harmful for the patient.

References