Reversible Liver Steatosis Induced by Chemotherapy of Mixed-phenotype Acute Leukemia

Atsujiro Nishioka¹, Yasushi Kubota¹², Eisaburo Sueoka²³ and Shinya Kimura¹

Key words: L-asparaginase, liver steatosis, mixed-phenotype acute leukemia, liver biopsy

(DOI: 10.2169/internalmedicine.55.5685)

A 49-year-old woman with mixed-phenotype acute leukemia received induction chemotherapy including cyclophosphamide (1,200 mg/m² on day 1), daunorubicin (60 mg/m² on days 1-3), vincristine (1.3 mg/m² on days 1, 8, 15 and 22), Escherichia coli L-asparaginase (5,000 U/m² on days 8, 10, 12, 14, 16, 18, 20 and 22), and prednisolone (60 mg/m² on days 1-14). Laboratory evaluation at diagnosis revealed a marked elevation in liver enzyme levels (AST, 353 IU/L; ALT, 354 IU/L; and T-bil, 1.1 mg/dL), possibly due to hepatic involvement of leukemia. The liver enzyme levels improved; however, on day 19, after six injections of L-asparaginase, the liver enzyme levels suddenly re-elevated (AST, 191 IU/L; ALT, 184 IU/L; and T-Bil, 3.1 mg/dL). Computed tomography (CT) showed diffuse low attenuation

¹Division of Hematology, Respiratory Medicine and Oncology, Department of Internal Medicine, Faculty of Medicine, Saga University, Japan
²Department of Transfusion Medicine, Saga University Hospital, Japan and ³Department of Clinical Laboratory Medicine, Faculty of Medicine, Saga University, Japan

Received for publication May 1, 2015; Accepted for publication July 29, 2015
Correspondence to Dr. Yasushi Kubota, kubotay@cc.saga-u.ac.jp
Chemotherapy was discontinued and a liver biopsy revealed severe diffuse steatosis involving >90% of the hepatocytes (Picture 2). Induction chemotherapy was unsuccessful, and subsequent high-dose cytarabine was administered. The patient then underwent haploidentical reduced-intensity stem cell transplantation. She achieved complete chimerism and remission. The liver enzyme levels and the CT attenuation values of the liver also improved (Picture 1).

In the present case, all administered chemotherapeutic agents were candidates for potentially inducing severe steatosis. The increased incidence of L-asparaginase-induced liver dysfunction has been reported when L-asparaginase is used in combination with vincristine and prednisolone (1). The severity of hepatic damage caused by chemotherapy including L-asparaginase is unpredictable (2). It is difficult to distinguish between leukemia infiltration of the liver and drug-induced hepatotoxicity. In this context, a liver biopsy is informative for the differential diagnosis.

The authors state that they have no Conflict of Interest (COI).

Acknowledgement
We thank Kazuo Wakayama for taking excellent pictures.

References