Genotype-4 hepatitis E in a human after ingesting roe deer meat in South Korea

Ja Yoon Choi, Jeong-Mi Lee, Yun Won Jo, Hyun Ju Min, Hyun Jin Kim, Woon Tae Jung, Ok Jae Lee, Haesun Yun, and Yeong-Sil Yoon

INTRODUCTION

Hepatitis E virus (HEV) has four genotypes. Of these four types, genotype 1 has caused epidemic outbreaks in Asia and Africa and genotype 2 is usually discovered in western Africa. Both genotype 1 and 2 are found exclusively in humans. On the other hand, genotypes 3 and 4 are usually isolated from sporadic hepatitis E in developed countries, and also found in swine, deer, wild boar populations. Sporadic infection in non-endemic areas such as developed countries has been known to be due to an influx from foreign countries. However, some reports of locally acquired acute viral hepatitis E in people with no history of travel to endemic regions have recently increased in non-endemic areas. Autochthonous sporadic HEV infections in a non-endemic area mostly give no clue as to their sources despite the diagnosis of acute viral hepatitis E, rendering the transmission routes undecided.

Of the viruses that cause acute viral hepatitis, HEV is known to be the only virus to have animal reservoirs. Since the discovery of HEV in swine, HEV has also been isolated from chickens, deers, mongooses, rabbits and rats, supporting zoonotic transmission and prompting its investigation.

We report here a case of acute viral hepatitis E that occurred after ingestion of raw meat of a wild roe deer in the absence of contact with another hepatitis patient or travel to an endemic area.

Keywords: Genotype 4 hepatitis E; Roe deer; South Korea

Abbreviations:
HEV, hepatitis E virus; LT, liver transplantation

Corresponding author: Hyun Ju Min
Department of Internal Medicine, Gyeongsang National University School of Medicine, 79 Gangnam-ro, Jinju 660-702, Korea
Tel. +82-55-750-8885, Fax. +82-55-758-9122
E-mail: lyreju@naver.com

Received: Jul. 2, 2012 / Revised: Sep. 1, 2012 / Accepted: Sep. 7, 2012
A 43-year-old male presented with abdominal discomfort for 3 weeks and jaundice lasting 1 week. He had a past history of diabetes mellitus, which had been diagnosed 3 years prior to admission to our hospital. However, he arbitrarily stopped taking hypoglycemic agents. The patient was a heavy alcohol drinker, with the consumption of 2 to 3 bottles of Soju, distilled liquor, 4 to 5 times a week. He denied any travel outside South Korea in the preceding years. About 6-8 weeks before hospitalization, he ingested raw meat (about 300 g) of a captured wild roe deer inhabiting in Gyeongnam province with his friends, who enjoyed hunting on a regular basis.

Physical examination on admission was generally normal, except for jaundice. Mild tenderness was only noted in the epigastric area. Initial laboratory data showed white blood cell count of 4.88 x 10³/mm³ (polymorphonuclear neutrophils, 57.2%; lymphocytes, 36.4%; and eosinophils, 1.5%), elevated serum total bilirubin level of 12.3 mg/dL, serum aspartate aminotransferase (AST) level of 1,637 IU/L, serum alanine aminotransferase (ALT) level of 1,949 IU/L, random glucose level of 220 mg/dL and HbA1c level of 10.8%. Hepatitis B surface (HBs) antigen, immunoglobulin M (IgM) anti-hepatitis B core antigen, anti-hepatitis C virus (HCV), HCV RNA (RT PCR) were all negative with positive anti-HBs. As a result of IgM anti-hepatitis A virus (HAV) was negative with positive immunoglobulin G (IgG) anti-HAV, acute hepatitis A could be excluded. Abdominal computed tomography showed findings compatible with secondary changes in acute hepatitis, and fatty infiltration with splenomegaly, which implied concurrent alcoholic liver disease. Seven days after admission, results of IgM anti-HEV and IgG anti-HEV were both positive, the optical density value of IgM anti-HEV of 3.656 (cut-off value: 0.276) and IgG anti-HEV of 3.384 (cut-off value: 0.375), which confirmed the diagnosis of acute viral hepatitis E. IgM anti- HEV and IgG anti- HEV were measured by a commercial immunoassay (HEV IgM and HEV IgG ELISA, Genelabs Diagnostic Pte. Ltd, Singapore). The serum total bilirubin peaked at 24.3 mg/dL and rapidly decreased. The levels of AST and ALT were highest at the time of admission and then showed a rapid decrease. Twenty-three days after admission, the patient was discharged with a total bilirubin of 8.06 mg/dL, AST of 130 IU/L and ALT of 133 IU/L (Fig. 1). Two months after discharge, IgM anti-HEV and IgG anti-HEV were both still positive with the optical density value of IgM anti-HEV of 3.315 (cut-off value: 0.282) and IgG anti-HEV of 2.753 (cut-off value: 0.375). Diagnosis of hepatitis E was confirmed by the detection of both IgM and IgG anti-HEV in serial samples and by the detection of serum HEV RNA.

Detection of HEV genome in patient’s serum

Viral RNA was extracted from 140 µL of anti-HEV IgM-positive serum in phosphate-buffered saline using a QIAamp viral RNA