Advance Access publication 6 April 2011

A dialysis patient with hyperammonaemia: inferior mesenteric-caval shunt as a cause of portal-systemic encephalopathy

Sir,

We report here a rare case of portal-systemic encephalopathy with occasional loss of consciousness caused by an inferior mesenteric-caval shunt via the internal iliac vein in a peritoneal dialysis (PD) patient who was switched to haemodialysis (HD).

A 71-year-old man with end-stage renal disease, who had undergone PD and was shifted to HD, was admitted to our hospital for occasional loss of consciousness. Physical examination showed dysarthria, asterixis and ataxic gait without clinical signs of portal hypertension and liver cirrhosis. Laboratory studies revealed normal liver function (albumin 2.3 g/dL, total bilirubin 0.62 mg/dL, lactate dehydrogenase 174 IU/L, aspartate aminotransferase 12 IU/L, alanine transferase 8 IU/L, and gamma-glutamyl transpeptidase 8 IU/L) and increased ammonia concentration in peripheral blood (151.5 μmol/L, normal range: 17.7–47.0). Neither hepatitis B surface antigen nor antibodies to hepatitis C were detected. Results from the brain computed tomography (CT) scan and magnetic resonance imaging were normal. An electroencephalogram showed an increase in delta waves. An endoscopy did not find esophageal varices or haemorrhoids. An enhanced abdominal pelvic cavity CT scan detected the presence of the inferior mesenteric vein (IMV)–internal iliac vein shunt. The inferior vena cava (IVC) was enhanced through the shunt in an early phase of enhanced CT. The venous phase of both the superior and inferior mesenteric arteriogram revealed a large shunt between the IMV and left internal iliac vein, with blood flowing from the portal vein to the IVC (Figure 1). Selective venous sampling for blood ammonia levels showed a higher value of 180.3 μmol/L in the shunt vessel in contrast with 132.1 μmol/L in the IVC and 94.5 μmol/L in the left external iliac vein. Portal vein pressure was normal, 10–16 mmHg. A transcatheter coil embolization of the shunt vessel was performed. The high preoperative serum ammonia concentration decreased to the normal range postoperatively. Two years after the embolization, a follow-up enhanced CT scan showed a narrowing of the shunt. The patient has suffered no

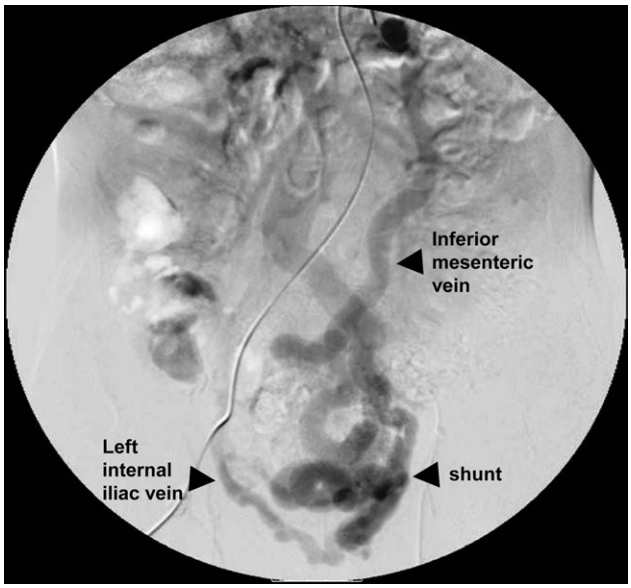

Fig. 1. The venous phase of superior mesenteric arteriography shows a large shunt between the inferior mesenteric vein and left internal iliac vein.

further episodes (such as occasional loss of consciousness or an increase in blood ammonia levels) after the embolization.

Portal-systemic encephalopathy without portal hypertension by an IMV–internal iliac vein shunt in a patient undergoing HD following unsuccessful PD is a very rare [1–3]. Our case may have a congenital portal-systemic venous shunt, since the shunt vessel was single and he did not have liver dysfunction and/or portal hypertension [4]. The placement of peritoneal catheter for a long period also might cause peritoneal fibrosis and sclerosis although this patient did not have any findings of peritoneal damages during surgery for catheter extraction. Haemodynamic changes during both HD and PD may also increase the flow of ammonia-rich portal venous blood into the systemic circulation through the shunt vessel [1].

Portal-systemic encephalopathy should be recognized as one of the neuropsychiatric disorders and be considered in the diagnosis of a hyperammonaemia-induced conscious disturbance in the dialysis population without liver dysfunction.

Conflict of interest statement. None declared.

[1]Department of Internal Medicine, Shiga University of Medical Science, Otsu, Shiga, Japan
[2]Department of Internal Medicine, Division of Blood Purification, Shiga University of Medical Science, Otsu, Shiga, Japan
E-mail: isshiki@belle.shiga-med.ac.jp

Tamaki Izumiya-Iwai[1]
Keiji Isshiki[1,2]
Masami Chin-Kanasaki[1,2]
Takashi Uzu[1,2]

References

1. Ubara Y, Hoshino J, Tagami T *et al.* Hemodialysis-related portal-systemic encephalopathy. *Am J Kidney Dis* 2004; 44: e38–e42
2. Paraíso V, Francos M, Rodríguez-Berzosa F *et al.* Portosystemic encephalopathy in a patient treated with peritoneal dialysis. *Am J Kidney Dis* 2007; 49: 854–858
3. Ueda M, Kojima C, Sugiura H *et al.* Hyperammonemia with intermittent loss of consciousness caused by chronic portal-systemic shunt encephalopathy (CSPE) in hemodialysis patient-A case report. *Nihon Touseki kaishi* 2007; 40: 445–450
4. Edwards EA. Functional anatomy of the porta-systemic communications. *AMA Arch Intern Med* 1951; 88: 137–154

doi: 10.1093/ndtplus/sfr039