

Perioperative evaluation and management of neurologic problems in LT candidates

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Various neurologic complications can occur in the liver transplantation (LT) candidates who have fulminant hepatic failure. Various degree of hepatic encephalopathy (HE), seizures, cerebrovascular diseases (especially cerebral hemorrhage due to coagulopathy), alcohol-withdrawal syndrome, and critical illness myopathy/neuropathy are possible neurological complications. Among those, development of HE is one of the major causes of mortality in those patients awaiting LT. Ammonia plays a definitive role in the development of brain edema and HE. Increased intracranial pressure (ICP) following accumulation of ammonia in the brain and subsequent brain edema is responsible for brain death or irreversible structural brain damage. High ammonia levels, increased cerebral blood flow and increased inflammatory response have been identified as major contributors to the development of HE and the related brain swelling. Risk factors for developing fatal HE are those with acute etiologies, progression to grade 3/4 hepatic encephalopathy, those who develop impaired brain stem signs, have seizures, have systemic sepsis requiring vasopressor support, an arterial ammonia $>150 \mu\text{mol/L}$, hyponatremia. LT candidates who are at risk developing severe HE should be received neurological evaluation such as clinical bedside neurological examination, emergent brain CT, electroencephalography (EEG) monitoring, and direct ICP monitoring via surgical procedures. The diagnostic procedures may help in neurologic prognostication of the patients and in making decision of surgical availability in the LT candidates. Strategies treating HE should be focused lowering ICP. Urgent osmotic therapy to low ICP such as mannitol or hypertonic saline infusion should be first step. Elimination of hyperammonia with various pharmacological agents or mechanical methods such as molecular adsorbent recirculating system (MARS) or continuous renal replacement therapy (CRRT) should be considered with efforts of lowering ICP. This lecture will address the manifestations, diagnosis, and management of acute HE in the LT candidates from the neurologist's perspectives.