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Letter: TIPSS is a promising therapy for sarcopenia in cirrhosis

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We congratulate Artru *et al.* on their study describing the positive impact of transjugular intrahepatic portosystemic shunt (TIPSS) placement on body composition in cirrhosis¹. Sarcopenia is one of the most common sequelae of chronic liver disease and is associated with increased morbidity and mortality, yet we have very few interventions to counteract the anabolic resistance observed in this population.

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Interestingly, the favourable body composition changes observed following TIPSS are at odds with the known skeletal muscle cellular effects of hyperammonaemia. TIPSS is associated with the development of hepatic encephalopathy in one third of patients, and hyperammonaemia is almost universal.² Hyperammonaemia is known to upregulate myostatin (a potent negative regulator of muscle production), reduce protein synthesis and increase autophagy within skeletal muscle cells.³ However, in this population, the pathogenesis of sarcopenia is complex and multifactorial, with portal hypertension as well as hyperammonaemia contributing to muscle loss. After TIPSS, reduction in portal pressures may improve gut function, caloric intake and absorption of nutrients and reduce portal and systemic inflammation via a reduction in bacterial translocation. In this study, the effects of TIPSS induced hyperammonaemia may explain the authors' observation that, while muscle mass improved overall, 94% of patients were still classified as sarcopenic at follow up.

Artru *et al.* found that low muscle mass was independently associated with higher 6-month mortality post-TIPSS. Pre-procedural sarcopenia has also been shown to be a predictor of post-TIPSS hepatic encephalopathy, presumably due to reduced ammonia clearance in skeletal muscle via the tricarboxylic acid pathway.⁴ A logical approach would be to try to address sarcopenia prior to elective TIPSS through aggressive nutritional therapies, such as nasogastric feeding, or testosterone replacement in hypogonadal men.^{5,6} Whether increasing pre-procedural muscle mass will improve post-TIPSS mortality is yet to be determined and should be a focus of future prospective trials.

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