

## Changes in regional cerebral blood flow in dogs with different grades of hepatic encephalopathy before and after successful closure of extrahepatic portosystemic shunts

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**Introduction:** Dogs with portosystemic shunts (PSS) often have concurrent hepatic encephalopathy (HE). The aim of this study was to assess differences in regional cerebral blood flow (rCBF) in dogs with PSS with mild or overt HE and to determine if changes in rCBF are reversible after PSS closure.

**Materials and methods:** Dogs undergoing PSS attenuation were divided in 2 groups (mild and overt HE). Single photon emission computed tomography (SPECT) with <sup>99m</sup>technetium-hexamethylpropylene amine oxime (<sup>99m</sup>Tc-HMPAO) tracer was performed before and 6 months after surgery if closure of the shunt was confirmed 3 months postoperatively using transplenic portal scintigraphy. Regional brain perfusion indices were calculated for different brain regions.

**Results:** A total of 21 PSS dogs, 15 with overt and 6 with mild HE, had a pre-operative SPECT scan. Pre-operatively, regional perfusion indices were significantly increased in subcortical regions of dogs with overt HE ( $p < 0.001$ ). Dogs with mild and overt HE had significantly lower regional brain perfusion in the left and right temporal cortices (mild HE, left  $p < 0.001$ , right  $p = 0.011$ ; overt HE, left  $p = 0.003$ , right  $p = 0.016$ ).

So far, 5 dogs with overt and 3 with mild HE also had a postoperative SPECT scan. No significant differences between pre- and postoperative regional brain perfusion indices were found in individual dogs.

**Discussion:** Dogs with PSS have altered brain perfusion. Dogs with overt HE have a more distinct pattern of redistribution of rCBF from cortex to subcortical regions than dogs with mild HE. Postoperatively, rCBF did not normalize within 6 months despite clinical improvement.