Hyaluronic acid as a liver function test to asses extrahepatic portosystemic shunt closure in dogs after surgical attenuation

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Liver function tests do not always normalize after successful surgical attenuation of portosystemic shunts (PSS). Currently the gold standard to demonstrate absence of portosystemic shunting is portal scintigraphy. Serum hyaluronic acid concentrations (sHA) in dogs with PSS are increased compared to those in healthy dogs. A preliminary study reported that sHA decreased 2 weeks after surgical attenuation of extrahepatic PSS (EHPSS).

The aims of the current study were: 1/ to serially evaluate sHA in dogs with surgically attenuated EHPSS and to determine differences in sHA in dogs with closed versus open (persistent or multiple acquired) PSS; 2/ to compare sHA in patients with EHPSS versus other liver diseases.

Twenty dogs with surgically treated EHPSS and 10 dogs with other liver diseases were included. Dogs with EHPSS had a blood sample taken at diagnosis, 1, 3 and 6 months postoperatively. At the 3-month control visit a transsplenic portal scintigraphy was performed to determine shunt closure status. Dogs with other liver diseases were only sampled at a single time point and comprised of: Maltese dogs with moderately increased postprandial bile acids and no liver disease based on imaging (n = 3), dogs with histologically confirmed portal vein hypoplasia (n = 4) or histologically confirmed chronic hepatitis (n = 3). All samples were analysed in batch using a commercially available ELISA kit (Hyaluronan Quantikine, R&D systems, Minneapolis).

At EHPSS diagnosis, median sHA was 337.20 ng/mL (158.02-790.66 ng/mL). After successful surgery (closed PSS), sHA dropped to 36.62 ng/mL (13.51-92.24 ng/mL) whereas in dogs with persistent portosystemic shunting, sHA remained higher (median 135.70 ng/mL; 56.44-312.04 ng/mL). Kruskal-Wallis tests revealed a significant difference between sHA in dogs with closed versus open EHPSS (P= 0.008,P= 0.005 and P= 0.025 at 1, 3, and 6 months postoperatively, respectively). The median sHA of dogs with other liver diseases was 119.64 ng/mL (48.44-160.00 ng/mL),which was significantly lower compared to dogs at the moment of EHPSS diagnosis (P= 0.009).

In dogs with EHPSS, sHA seems to be a promising non-invasive biomarker to determine EHPSS closure after surgical attenuation. In addition, it might also be valuable to differentiate dogs with EHPSS from dogs with other liver diseases.