

Relative Risk of Liver Failure in Dairy Cows with Left Abomasal Displacement

J. Rehage; M. Kaske; H. Scholz

Clinic for Cattle Diseases, Veterinary School of Hannover, Bischofsholer Damm 15, D-30173 Hannover, Germany; juergen.rehage@tiho-hannover.de

Introduction

Dairy cows with left abomasal displacement (LDA) are in substantial negative energy balance and mobilize considerable amounts of non-esterified fatty acids. Thus, fatty liver is a common hepatic disorder in LDA cows. Results of a previous study showed that approximately 4–5% of LDA cows referred to our clinic for surgical correction of abomasal displacement died or were sacrificed due to liver coma. We found not only cows with severe fatty liver but also cows with moderate or even mild fatty liver affected by liver failure. Characteristically, cows with liver failure showed typical clinical signs of a hepatic encephalopathy (general depression, ataxia, recumbency or coma) and a low plasma amino acid ratio (Val+Leu+Ile/Phe+Tyr), low plasma cholesterol concentrations and high plasma levels of ammonia, total bilirubin and hepatic enzymes.

Thus, aim of the study was to calculate the risk of liver failure of dairy cows with LDA related to the hepatic triglyceride content.

Material and Methods

We studied 182 German HF-cows (mean age 5.3 ± 1.3 years, < 6 weeks postpartum) with LDA, two or three days after right flank omentopexy. None of the cows suffered from additional diseases such as endometritis, mastitis or lameness. Liver failure was defined according to clinical signs (general depression, low feed intake, ataxia, recumbency or coma) and lab data (plasma levels: amino acid ratio < 4.0, ammonia > 35 $\mu\text{mol/L}$, total bilirubin > 20 $\mu\text{mol/L}$, cholesterol < 1.4 mmol/L). Hepatic triglyceride (TGL) and glycogen con-

tent was measured enzymatically in liver biopsies. Results were statistically evaluated with the (SAS) statistic package.

Results and Conclusions

According to selection criteria, 32 of the 182 (17.6%) studied cows suffered from liver failure. Average triglyceride liver content in cows with undisturbed convalescence ($n=150$) and in cows with liver failure was 61 ± 38 and 89 ± 33 mg/g FW, and liver glycogen content was 15 ± 11 and 14 ± 12 mg/g FW, respectively. Liver failure rate in cows with no fatty liver (hepatic TGL < 35 mg/g FW; $n=42$) was 7.1% with mild (hepatic TGL 36 – 64 mg/g FW; $n=78$) failure rate was 12.8% with moderate (hepatic TGL 65 – 100 mg/g FW; $n=38$) the rate was 26.3% and with severe fatty liver (hepatic TGL > 100 mg/g FW; $n=24$) 37.5% of the patients developed liver failure. Compared to cows with no fatty liver, relative risk of liver failure in cows with mild fatty liver was 1.8 (n.s.); with moderate fatty liver 3.7 ($p < 0.05$); and with severe fatty liver, 5.3 ($p < 0.01$). Despite intensive treatment in the groups with mild, moderate or severe fatty liver about 30% of cows with liver failure (overall 9 of the 182 studied cows; 4.9%) died in liver coma or were culled for that reason. In the logistic regression, liver glycogen content was not detected as a risk factor for liver failure.

Results show that most of the cows with LDA, even those with severe fatty liver, recover without complications in the post-surgical period. Thus, although a significant correlation was found between liver triglyceride content and occurrence of liver failure, other still-undiscovered factors than hepatic TGL must contribute to the development of liver failure.