Acute phase response in the primiparous dairy cows after repeated percutaneous liver biopsy during the transition period

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Abstract

The aim of this study was to evaluate the acute phase response of dairy cows to repeated liver biopsy in order to estimate the safety of this procedure during the transition period. Liver biopsies (up to 1000 mg of liver tissue) were conducted twice a day, 7 days before expected parturition and 3 days after calving. The number of needle insertions for each biopsy was recorded and was dependent on the amount of obtained tissue. Blood samples were taken on day 7 before expected parturition, then on days 3, 4, 7 and 14 after calving. Body temperature was measured daily in all 30 cows from day 3 until day 14 after calving. The concentrations of haptoglobin, serum amyloid A, fibrinogen and interleukin-6 were determined in serum and plasma. In 16.7% of cows, the rectal body temperature rose by ≥ 0.5°C on the day after liver biopsy. Although the concentrations of haptoglobin, serum amyloid A and fibrinogen increased significantly after calving (p < 0.01), there was no influence of the number of biopsies on the acute phase reaction and repeated biopsy during the transition period had no effect on body temperature. Therefore, the procedure may be regarded as safe for cows during the transition period.

Key words: acute phase response, dairy cow, liver biopsy, transition period

Introduction

The transition from a nonlactating to lactating state is an enormous challenge for dairy cows and it may have a negative impact on health and reproduction. Even subclinical changes can impact behaviour and milk production in dairy cows (Jawor et al. 2012). Fatty liver is common in early lactating dairy cows and one study showed that more than 50% of dairy cows had hepatic lipidosis between 6 and 17 days postpartum (Jorritsma et al. 2001). The diagnosis of fatty liver in cows is based on biochemical serum analysis, biopsy and analysis of hepatic tissue as well as ultrasonography (Acorda et al. 1995). Among biochemical pa-