Evaluation of the Effects of Vitamin D Administration on Inflammatory Parameters, Liver Activity Index and Liver Functionality Index at the Beginning of Lactation in Dairy Cows: A Preliminary Study

Feyyaz Kaya[1], Hasan Batmaz[1*]

[1]Department of Internal Medicine, Faculty of Veterinary Medicine, University of Bursa Uludağ, Turkey

Short Title: **Effects of vitamin D on inflammatory parameters and liver indexes in dairy cows**

*Correspondence: Hasan BATMAZ

Department of Internal Medicine

Faculty of Veterinary Medicine

Bursa Uludag University

Bursa

Türkiye

Phone: 90-224-2940806

FAX:90-224-2941202

E-mail: hbatmaz@uludag.edu.tr

Summary

The aim of this study was to investigate the effect of vitamin D administered 24 hours after calving on calcium-phosphorus metabolism, carbohydrate and lipid metabolism and inflammatory parameters and related liver activity index (LAI) and liver functionality index (LFI) in dairy cows. Twenty multiparous Holstein cows were randomly assigned to experimental (EC) and control group (CG) in the study. The EG received 5.000.000 IU vitamin D_3 (5 mL) 24 hours after parturition intramuscularly. Furthermore, 5 mL of 0.9 % NaCl was administered to CG intramuscularly. Blood samples were taken 24 hours after parturition before vitamin D and placebo administration and on the 3rd, 7th, 14th and 28th days postpartum. Total bilirubin, albumin, total cholesterol, vitamin A concentrations were measured from blood serum to calculate LFI and LAI. Additionally, NEFA, BHBA, haptoglobin, serum amyloid A, ceruloplasmin, calcium, potassium, phosphorus, magnesium, parathormone, total protein, triglyceride, AST and GGT were also measured. The LFI score of the EG was -2.76±0.82 and of the CG was -3.98±1.37. SCH was observed in only one cow in EG and five in CG after the third day of postpartum. NEFA levels in the EG significantly differ on days 7th, 14th, 28th when compared to vitamin D pretreatment values. However, NEFA levels were decreased differ only on day 28 postpartum ($p<0.05$) in the CG. While positive correlations were detected between vitamin D and calcium ($p<0.05$), vitamin A ($p<0.01$); a negative correlation was determined between vitamin D and NEFA ($p<0.01$). However, between calcium and NEFA, haptoglobin, serum amyloid A ($p<0.05$) negative correlations were determined. In conclusion, it can be suggested that vitamin D_3 administration can prevent SCH after 3rd day and have positive effects on postpartum NEFA levels. Also we thought that the administration of vitamin D has a limited positive effect on LFI in dairy cows.