Subclinical hypocalcemia in dairy farms with low milk yield and its consequences on health

Laurent Alvès de Oliveira, Chloé Astruc, Pauline Otz, Richard Eicher

Subclinical hypocalcemia in dairy farms with low milk yield and its consequences on health

L. Alves de Oliveira[1], C. Astruc[1], P. Otz[1], R. Eicher[2]
(1)VetAgro Sup, Université de Lyon, 69280 Marcy, France (2) Biokema SA 1023 Crissier, Switzerland
laurent.alves@vetagro-sup.fr

Introduction: Subclinical hypocalcemia (SCHC), i.e. calcemia levels (Ca) below 2 mmol/L[2,3] or 2,1 mmol/L[4] within 48 hours after calving without clinical signs, is a common metabolic disorder in dairy cows. Cows with SCHC are more likely to develop displaced abomasum, ketosis, dystocia, uterine prolapse, retained placenta and mastitis. SCHC prevalence in USA herds is very high, ranging from 39%[2,3] (Ca < 2) to 78%[4] (Ca < 2,1). The objective of our study was to determine if the importance of SCHC in mid-mountain herds in France (Monts du Lyonnais) is the same as in USA. These herds have lower production levels, different breeds and a diet with an important part of grass.

Materials & methods: The study was conducted on 115 cows from 14 farms of the clinic of the Veterinary School of Lyon as part of a care follow-up. Calcemia was measured 12 to 24 hours after calving. Assisted calving (breeder or veterinarian), placental retention, metritis, clinical mastitis, clinical ketosis and displacement of the abomasum were recorded. A control of the milk production was carried out each month by the National DHIA testing system. The statistical analysis was carried out using R software (Chi2, Student, Mann-Whitney Wilcoxon) and Excel (odds ratio).

Results: 33 or 45 cows had a Ca lower than 2 or 2,1 mmol/L, respectively (28.7% or 39% of our sample). 15.2% of the primiparous, 40.6% of the lactations 2, 47.8% of the lactations 3 and 62.5% of the lactations 4 and + had a Ca lower than 2,1 mmol/L. The prevalence of SCHC is significantly lower in primiparous cows vs multiparous cows. A significant effect of breed ($P < 0.04$) was observed on Ca, 46.8% of the Holstein cows vs 33.3% of the Montbéliardes had a Ca lower than 2,1 mmol/L. Among the 115 cows, 39 had an assisted calving, 15 had placental retention, 15 showed a metritis and 29 a clinical mastitis. No clinical ketosis or displacement of the abomasum was reported. Cows with SCHC had an increased risk of placental retention (OR = 7, [95% CI = 2.1-25.6], p = 0.002) and of assisted calving (OR = 2, [95% CI] = 0.9 - 4.7], p = 0.08). Milk yield (mean of the 3 first monthly controls) was higher for hypocalcemia cows : 32.4 kg (± 2.2) vs 28.2 kg (± 1.5), p = 0.002. No difference could be shown for protein level, fat content and somatic cell counts.

Discussion: The prevalence of SCHC in our study is rather high, although lower than those reported in USA and in the only French study[1] (45%). This is probably related to the lower production level of the herds in our study. This also explains that Montbeliardes have less subclinical hypocalcemia than Holstein. The association between SCHC and postpartum diseases described in the literature is present. Nevertheless, for some diseases, this association could not be found because of the small size of our sample. This study shows that the prevention of hypocalcemia is important also in herds with relatively low milk yield.

The authors thank VETALIS Technologies (Châteaubernard, France) for their financial support.

References: [1]Gillet et al., 2016 Proc. 29th World Buiatrics Congress, Dublin 186, [2]Horst et al., 2003. J Dairy Sci, 86 (Suppl. 1), 247. [3]Reinhardt et al. 2011. Vet. J. 188, 122-124., [4]Rodríguez et al 2017. J Dairy Sci, 100, 7427-7434.