Do differences in maternal immunoglobulin G influence passive transfer and subsequent cria growth in alpacas?

K. Gleason,a L.Edens,b A. Pena

aDancing Horse Farm, Pemberton, NJ; bLittle Creek Farm, North Salem, NY

Undetected failure of passive transfer (FPT) of immunoglobulin is a major determinant of mortality in newborn alpaca cria, and early detection with proactive management can reduce mortality rates in cases of suspect FPT. The goal of this prospective observational study was to evaluate maternal serum IgG levels as a predictor for subsequent cria FPT (IgG <400 mg/dl) and/or poor cria early development. Prepartum blood samples were collected from dams within 60 days of anticipated birth, and from suckling cria within 36 hours after birth, and analyzed for serum IgG concentration by use of a commercial spectrophotomic assay. Any cria with a birth IgG < 400 mg/dl was offered oral maternal colostrum as routine practice. Birth weights, and weights at two weeks and two months were recorded for all cria to establish growth patterns. Dams were divided into three groups based on natural breaks in prepartum IgG levels of 1000 to 1499 mg/dl (n = 25), 1500 to 2000 mg/dl (n = 22), and >2000 mg/dl (n = 13). Analysis of variance within maternal groups revealed significant differences in cria birth IgG levels, whereby the highest levels were observed when dam IgG measured 1000-1499 mg/dl, followed by 1500-2000 mg/dl and > 2000 mg/dl (640, 554 and 545 mg/dl, respectively). Although there were cria with birth IgG <400 mg/dl in every dam group, there were 20% more in the latter group. Cria that were handfed maternal colostrum tended to have lower measured IgG (p<.05). Despite differences in birth IgG levels, cria birth weights, weights at two weeks and at two months did not differ amongst maternal groups. Interestingly, while the maternal group with the highest IgG had more births in the spring (7 vs 5 and 2), their cria subsequently had the lowest IgG than the other groups, raising concerns for a seasonal effect on immunoglobulin passive transfer. Results of this study suggest that maternal IgG could be an early, gestational indicator of potential FPT births in North American alpacas. Early identification of possible problems can negate the need for costly and invasive treatments such as plasma transfer, which often requires hospitalization. More research is needed to follow cria development to weaning, and to investigate possible seasonal influences on passive transfer.

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