Puerperal metritis in dairy cows: risk factors, efficacy of ceftiofur therapy and reproductive efficiency

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The objectives of this study were to assess the risk factors for puerperal metritis (MET), the effects of MET on milk yield (MY) and reproductive efficiency, and the efficacy of ceftiofur (CEF) therapy in Holstein dairy cows. The study was conducted in a commercial dairy herd (Cordoba, Argentina) where Holstein cows (N= 303) calving between April 15 and May 15, 2005 were enrolled.

Cows were body condition (BC) scored (1-5) and tail bled on -14 and 7 d relative to parturition. Rectal temperature (RT) was recorded on 5-7 days postpartum (dpp). Vaginal mucus (VM) was obtained with a gloved hand on 5-7, 21, 31, and 41 dpp, and was classified as VM0 (normal clear mucus), VM1 (clear mucus with pus flecks), VM2 (mucopurulent not fetid mucus), and VM3 (watery, purulent or brown-colored, fetid). Cows having a VM3 and RT <39.1°C were categorized as having clinical metritis (CM), and those having a VM3 and RT ≥39.1°C on 5-7 dpp were categorized as having puerperal metritis (PM). Clinical metritis and PM cows were randomly assigned to control (PLA) or CEF group (2.2 mg/kg for 3d; Ceobiotic®, Tecnofarm SRL, Argentina). Cure rate was assessed on 21 dpp by VM inspection as mentioned above. Cows having VM other than VM0 between 21 and 41 dpp were diagnosed as having CE. Plasma blood samples were analyzed for non-esterified fatty acids (NEFA), beta-hydroxy butyrate (BHB) and blood urea nitrogen (BUN) using commercial kits and IGF-1, insulin, and leptin by radioimmunoassay. Data were analyzed with PROC MIXED, PROC GENMOD and PROC PHREG from SAS®.

The risk for MET increased with abnormal calving (AOR [adjusted odds ratio] =2.58, P=0.008), as prepartum NEFA and BHB increased (AOR=1.001, P=0.177, and AOR=1.001, P=0.042, respectively). Conversely, risk of MET decreased as prepartum IGF-1 and postpartum BCS increased (AOR=0.652, P=0.144; AOR=0.054, P=0.092). The CM and PM cows had lower MY by 90 dpp than the non-MET cows (2235.62±172.11 vs. 2367.20±77.45 vs. 2646.56±82.10 kg, P=0.009; respectively). Puerperal metritis cows had lower risk for pregnancy rate by 100 dpp (AOR=0.19, P=0.001), higher risk for non-pregnancy rate by 200 dpp (AOR=1.93, P=0.088), higher risk for reproductive culling (AOR=4.12, P=0.062), lower hazard rates for pregnancy by 150 dpp than non-MET or CM cows (HR=0.753, P=0.004), and took longer to get pregnant than herdmates (129±3 vs. 111±8 vs. 109±3 days, for PM, CM and non-MET cows, respectively, P=0.001). Ceftiofur had no effect on cure rate 21 dpp (P=0.468), but reduced the risk for reproductive cull (AOR=0.134, P=0.038). In conclusion, the risk for MET increases with abnormal calvings and as NEFA and BHB increases, while the risk decreases as IGF-1 and BCS increase. Puerperal metritis has detrimental effects on MY and on reproductive efficiency since PM cows take longer to get pregnant and are at higher risk for culling. Lastly, CEF has no effect on cure rate but reduces the culling rate.

Keywords: Dairy cow, puerperal metritis, reproductive efficiency, risk factors