



## Effect of puerperal metritis on reproductive and productive performance in dairy cows in Argentina



M. Piccardi<sup>a,\*</sup>, G. Romero<sup>b</sup>, G. Veneranda<sup>b</sup>, E. Castello<sup>b</sup>, D. Romero<sup>c</sup>,  
M. Balzarini<sup>a</sup>, G.A. Bó<sup>d,e</sup>

<sup>a</sup> Cátedra de Estadística y Biometría, Facultad de Ciencias Agropecuarias, Universidad Nacional de Córdoba, Córdoba, Argentina

<sup>b</sup> La Sibila (Grupo Los Lazos S.A.), Santa Fe, Argentina

<sup>c</sup> Zoetis Argentina, Buenos Aires, Argentina

<sup>d</sup> Instituto de Reproducción Animal Córdoba (IRAC), Córdoba, Argentina

<sup>e</sup> Medicina Veterinaria, Instituto de Ciencias Básicas y Aplicadas, Universidad Nacional de Villa María, Córdoba, Argentina

### ARTICLE INFO

#### Article history:

Received 21 March 2015

Received in revised form 21 October 2015

Accepted 28 October 2015

#### Keywords:

Puerperium

Days open

Accumulated production

Hazard model

### ABSTRACT

The objectives of this study were to evaluate the reproductive and productive performance of dairy cows with and without puerperal metritis and to evaluate the effectiveness of using a long-acting ceftiofur preparation. Dairy cows in one dairy farm, calving from July 2009 to January 2010, were examined between 3 and 14 days postpartum and classified on the basis of vaginal discharge into three groups: cows with normal discharge (control; C); cows with a bloody mucus purulent or pathologic nonfetid discharge (PnFD), and cows with bloody mucopurulent or purulent fetid discharge (PFD). Cows in C and PnFD groups were not treated, whereas those in the PFD group were randomly allocated to receive 2.2 mg/kg of ceftiofur subcutaneously behind the ear (PFD-T) or remain untreated (PFD-No T). From the 640 cows examined, 58.2% formed the C group, 13.4% formed the PnFD group, and 28.4% formed the PFD group. Survival curves differed between cows in the C group and PFD-No T group ( $P = 0.0013$ ) and between PFD-No T versus PFD-T group ( $P = 0.0006$ ). Survival curves of PnFD were intermediate and did not differ from those in the C group ( $P = 0.2$ ) and PFD-T group ( $P = 0.1$ ) but tended to be different from the PFD-No T group ( $P = 0.056$ ). The postpartum interval to achieve a 25% pregnancy rate was 72 days for cows in the C group, 73 days for the PFD-T group, 83 days for PnFD group, and 95 days for the PFD-No T group. The chance of pregnancy in a cow in the C group was 1.98 times higher (95% confidence interval = 1.33, 3.08) and in cows in the PFD-T group was 2.16 times higher (95% confidence interval = 1.37, 3.50) than that in the PFD-No T group. Finally, the chance of pregnancy in cows in the PnFD group tended to be higher ( $P = 0.08$ ) than that in the PFD-No T group but did not differ from the other two groups. Cumulative 305-day milk production was higher ( $P < 0.0001$ ) in C group than those with vaginal discharge, regardless of fetidness and regardless of treatment. It is concluded that puerperal metritis affects the reproductive and productive performance of dairy cows and the treatment with ceftiofur was effective in reducing the adverse effects on reproductive performance but not on milk production.

© 2016 Elsevier Inc. All rights reserved.

### 1. Introduction

Puerperal metritis is an inflammation of all the layers of the uterus, which is characterized by the presence of a watery, reddish-brown vulvar discharge [1]. In some cases, puerperal metritis is classified as a disease complex

\* Corresponding author. Tel.: 54-351-4334103/05/16/17/18.

E-mail address: [monicapiccardi@gmail.com](mailto:monicapiccardi@gmail.com) (M. Piccardi).

without distinguishing the severity or clinical presentation, which hinders comparisons between studies [1]. Sheldon et al. [2] standardized the clinical definition of puerperal metritis to include clinical symptoms such as reduced milk production, dullness, or other clinical signs of toxemia with fever ( $>39.5$  °C) within 21 days postpartum.

Several factors contribute to the etiology, severity, and duration of puerperal metritis. Several studies have suggested that risk factors for metritis include dystocia, twins, retained placenta, stillbirth, abortion, and prolapsed uterus [3–7]. Although metritis and endometritis are common postpartum uterine diseases that have a profound negative effect on reproduction in dairy cows [6,8–11], the reported results of their effects on milk production are conflicting [12–14]. Thus, Dubuc et al. [15] found that metritis decreased milk production only in multiparous cows.

Prevention and early treatment of puerperal metritis may result in an economic benefit because progress of the condition is avoided [16]. Treatment has historically involved intrauterine infusion of antibiotics [17,18] or injection with PGF $2\alpha$  [19,20]. Parenteral administration of ceftiofur sodium [21] or ceftiofur hydrochloride [22] has been shown to be effective for treatment of metritis. Ceftiofur reduced the incidence of metritis in cows with retained fetal membranes [10,23,24]. This effect was proposed to be linked with a decrease in the uterine pathogen load in the early postpartum period [25]. The information regarding its efficacy in the treatment of metritis in pasture-based production systems such as those in Argentina is limited. Previous studies performed in Argentina with dairy cows under total mixed ration formulated diets have shown that daily treatment with ceftiofur hydrochloride for three consecutive days did not affect the cure rate of metritis or peak milk production, but it increased the risk for pregnancy at timed artificial insemination (AI) and reduced the risk for reproductive culling [26]. However, one of the main problems regarding daily treatments in pasture-managed systems has been the failure to continue the treatments properly that significantly affect the cow's response to the therapy. Therefore, the objectives of this study were to evaluate the reproductive and productive performance of dairy cows with and without puerperal metritis and to reevaluate the effectiveness of using ceftiofur, a long-acting antibiotic treatment on those cows with metritis in pasture-based production systems.

## 2. Materials and methods

### 2.1. Data

The study was conducted from July 2009 to January 2010 in nine commercial dairy herds in the center of Santa Fe province ( $32^{\circ}31'30.05''S$ ;  $61^{\circ}16'40.87''W$ ). The total population of the farm used for the study was 3300 milking cows with an average production of 7550 kg per lactation, and data from 690 animals calving during the period of the study were included. Animals were milked twice daily. Prepartum cows were housed in lots 30 days before parturition where they were fed daily and provided with water ad libitum. At least 35 m $^2$  was available to each cow. The diet consisted of corn silage, feed with anionic salts and alfalfa

hay. This ration was composed of 14% protein, 1.6 Mcal net energy of lactation/kg of dry matter (DM). Lots were looked four times a day to observe periparturient cows.

All events occurring at calving were recorded by dairy staff. The type of calving was classified as: (1) normal calving (cows that had no difficulty in giving birth to a single calf without assistance); or (2) assisted calving (cows that needed assistance by herdsman or veterinarian). Assisted calving was further rated as: assistance as a precaution, calf bad presentation, or a large-sized calf (forced extraction). Retained fetal membrane was considered if the placenta was not released within 24 hours of calving, for both normal and assisted calvings. The primiparous or multiparous state of the cow was considered as a second-level variable.

After calving, the cows were placed in a sanitary herd for 2 to 4 days and then transferred to a herd where all cows have calved recently (fresh cows). Diet consisted of alfalfa and graminoid grazing, corn silage, and balanced feed inside the milking parlor; diet was based on 16% protein, 1.5 to 1.7 Mcal net energy of lactation/kg DM, reaching a total of 18 to 20 kg DM intake in the first 21 days postpartum. Vaginal discharge of all cows was analyzed 3 to 14 days postpartum. The time window of the examination of vaginal discharge (3–14 days) was determined on the basis of the standard practice of the veterinarian health visit to the dairy farms, which is usually once every 2 weeks or even once every month for the commercial herds in Argentina. The type of discharge was determined by extraction with a clean palpation sleeve after vulva disinfection with water containing a quaternary ammonium solution (Bagodryl, Biogenesis-Bago, Buenos Aires, Argentina). The criteria to determine the presence of puerperal metritis was the presence of a fetid, watery, purulent, sometimes brown fluid discharge; depression, sunken eyes, and loss of appetite [2]. Thus, cows were classified as having three types of discharge: (1) normal discharge or control (C), with a similar appearance to egg whites; (2) pathologic nonfetid discharge (PnFD), with a mucopurulent or pathologic nonfetid discharge, and (3) pathologic fetid discharge (PFD), with bloody, mucopurulent or purulent, fetid discharge. Cows in C and PnFD groups were not treated with antibiotics, whereas those in the PFD group were subdivided into two subgroups; one was treated with 2.2 mg/kg of slow-release ceftiofur hydrochloride (Excede, Zoetis, Buenos Aires, Argentina) administered at the base of the ear (PFD-T), whereas the other subgroup was not treated with antibiotics (PFD- No T). The use of long-acting (slow release) ceftiofur is accepted in Argentina and other countries like the United States and Canada; it is not necessary to discard the produced milk from cows under treatment. However it could happen that such therapy may not be acceptable in other countries.

Afterward, between Days 21 and 30 postpartum, all cows were tested for possible clinical endometritis in cows that had normal discharge between 3 and 14 days postpartum and to check if those cows that had been treated were cured. The criterion used to diagnose clinical endometritis was the presence of a purulent or mucopurulent discharge, which was extracted with a clean sleeve after disinfection of the vulvar area, as described above. All cows

Download English Version:

<https://daneshyari.com/en/article/2094904>

Download Persian Version:

<https://daneshyari.com/article/2094904>

[Daneshyari.com](https://daneshyari.com)