Available online at www.sciencedirect.com
ScienceDirect
Theriogenology 74 (2010) 1414–1419
Theriogenology
www.theriojournal.com

# Oxytocin treatment immediately after calving does not reduce the incidence of retained fetal membranes or improve reproductive performance in crossbred Zebu cows

R.A. Palomares[a,b,*], J.C. Gutiérrez[a], G. Portillo[a], J.C. Boscan[a], M. Montero[a], Y. López[a], H.S. Maxwell[b], R.L. Carson[b], E. Soto[a]

[a] *Unidad de Investigación en Reproducción Animal, Facultad de Ciencias Veterinarias, Universidad del Zulia, Maracaibo, Venezuela 4001*
[b] *Department of Clinical Sciences, College of Veterinary Medicine, Auburn University, Auburn, Alabama 36849*

Received 29 September 2009; received in revised form 27 May 2010; accepted 11 June 2010

**Abstract**

The objective was to determine the effect of oxytocin treatments after calving on the incidence of RFM and reproductive performance in dual purpose cows under tropical conditions. Five hundred thirty six pluriparous, crossbred Zebu cows were randomly assigned to two groups: Oxy (n = 280): cows were given 30 IU of oxytocin im immediately after normal unassisted calving, and again 6 h later; C (n = 256): control. Expulsion of fetal membranes was evaluated 24 h after delivery. After a 30-d voluntary waiting period, AI was done 12 h after cows were detected in estrus. Oxytocin had no effect on the incidence of RFM (4.6 vs. 3.1% for Oxy and C, respectively, $P > 0.05$). Cows in Oxy and C had similar first service and overall pregnancy rates (54.0 vs. 47.8% and 75.4 vs. 73.4%; respectively, $P > 0.05$). There were no differences between Oxy and C for calving to first estrus (83.6 ± 3.7 vs. 77.2 ± 3.8 d) and calving to conception intervals (113.6 ± 5.0 vs. 110.5 ± 5.2 d), as well as rates of anestrus (13.6 vs. 13.7%), repeat breeding (21.8 vs. 20.7%), and culling (15.7 vs. 16.4%). In conclusion, oxytocin treatment after normal unassisted calving did not significantly reduce the incidence of RFM or improve reproductive performance in crossbred Zebu cows under tropical conditions.
© 2010 Elsevier Inc. All rights reserved.

*Keywords:* Oxytocin; Calving; Reproductive performance; Zebu; Cow; Retained fetal membranes

## 1. Introduction

Reproductive performance is one of the most important factors determining profitability of dual purpose (beef and dairy) herds. Maximum reproductive performance is achieved by an intercalving interval of approximately 1 y; this can only be achieved if cows cycle and become pregnant before 90 d postpartum [1]. Several factors that negatively impact reproductive efficiency in dual purpose herds have been identified, including undernutrition, presence of a calf during milking, inefficient estrus detection, stress, systemic diseases, retained fetal membranes (RFM), and uterine infections [2].

Cows with RFM or delayed uterine involution have significantly reduced pregnancy rates and longer intervals to first insemination and to conception than unaffected cows [3,4]. Frazer [5] emphasized that prompt uterine involution and elimination of the inevitable calving-related bacterial contamination is an important key to optimal first service conception rates and reduction of days not pregnant.

Oxytocin plays a crucial role in calving and uterine involution by inducing uterine contraction, thereby ex-

* Corresponding author. Tel.: 334-750-3088; fax: 334-844-4368.
*E-mail address:* palomnr@auburn.edu (R.A. Palomares).

0093-691X/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.theriogenology.2010.06.013

pelling exudates associated with infection through the cervix, and stimulating synthesis of $PGF_2\alpha$ [6], which increases uterine contraction and phagocytosis [7], reducing total bacteria contents in the uterus [8]. Several studies have demonstrated that oxytocin treatment induces $PGF_2\alpha$ secretion in postpartum cows [9], which can stimulate uterine motility [10] and uterine involution [11]. That prompt uterine involution favors early resumption of ovarian cyclicity [12], and optimizes the uterine environment necessary for normal embryo development and placental attachment has encouraged administration of oxytocin to prevent RFM, delayed uterine involution, and endometritis in dairy cows.

A trial using pluriparous Friesian cows, given 30 IU of oxytocin immediately after normal unassisted calving and again 2 to 4 h later, demonstrated less RFM 24 h after calving for treated cows (10.9%) compared with control cows (24.6%) [13]. Treatment with oxytocin resulted in a significant improvement of fertility in treated cows with the average interval from calving to conception being reduced from 124.4 to 93.7 d ($P < 0.0001$) [13]. Some pharmaceutical distributors suggest that an injection of oxytocin immediately after a routine calving may reduce the incidence of RFM, hasten the rate of uterine involution and improve reproductive performance. However, reports are contradictory, with limited data to support this recommendation [14–16].

Frazer [5] summarized that a single dose of oxytocin (40 IU) may cause increased frequency of rapid uterine contractions or initial tetanic spasm (duration of response, 6 to 10 min), but would not maintain sustained myometrial activity [5]. Bajcsy et al [17] working with Holstein cows, reported a significant short term effect of oxytocin treatment (50 IU) on intrauterine pressure, indicating that a single dose of oxytocin can provoke a rapid, but not prolonged uterotonic effect, making it necessary to give frequent treatments to achieve this effect [17].

Most studies regarding uterine response to oxytocin treatment have been conducted with *Bos taurus* dairy and beef cattle in temperate climates. However, there are no reports regarding the effects of oxytocin treatment immediately after calving on the uterine involution, incidence of RFM and reproductive performance in *Bos indicus* cows. The objective of the present study was to determine the effect of the administration of oxytocin immediately after normal unassisted calving (and again 6 h later) on the incidence of RFM and the effects on reproductive performance in dual purpose crossbred Zebu cows under tropical conditions.

## 2. Materials and methods

### 2.1. Location and environmental conditions of the farm

The study was conducted in a dual purpose (milk and beef production) commercial farm (herd size: 3814 milking cows) located in the Maracaibo Lake basin, Venezuela. The range of mean daily temperature in the region is 26 to 30 °C, mean rainfall is 1829.6 mm/y, and relative humidity is 73%. The dry season is from December to April and the rainy season is from May to November. This agroecological zone is classified as a sub-humid tropical forest. The study was carried out using cows that had a normal unassisted calving from January to May 2001 (humidity 70% and temperature 26 °C).

### 2.2. Animals and treatments

A total of 536 pluriparous, crossbred Zebu × Holstein (*B. taurus* × *B. indicus*) cows in moderate "3" and good "3.5" body condition score (scale 1–5; 1 = very thin, 5 = very fat) [18] were randomly selected and allotted to one of two experimental groups:

Oxytocin group (Oxy, n = 280): Cows treated im with 30 IU of oxytocin (Pituifral® C.A. Laboratorios Asociados, Venezuela) immediately following a normal unassisted calving, and repeated 6 h later.

Control group (C, n = 256): no treatment. Control cows were selected from the same herd as the Oxy group, and calved concurrently.

Only cows with normal unassisted calving were used. Twenty four hours after delivery, an examination was carried out to check for the expulsion of the fetal membranes. If the fetal membranes were not expelled by 24 h after calving, they were considered retained. All cows with RFM received an intrauterine infusion of 40 mL (2 g) of oxytetracycline (5% solution).

### 2.3. Estrus detection and pregnancy diagnosis

After calving, estrus detection was done by visual observation of estrous behavior for a period of 1 h each morning (06:00–07:00) and afternoon (18:00–19:00) and with the help of bulls that were altered, so that intromission could not occur. Cows were artificially inseminated by an experienced technician 12 h after first detected in estrus according to the am-pm insemination rule. Pregnancy diagnosis was performed by an experienced veterinarian by transrectal palpation 45 to 60 d after service. After calving, the voluntary waiting period was 30 d, so that cows were inseminated from

Download English Version:

https://daneshyari.com/en/article/2097818

Download Persian Version:

https://daneshyari.com/article/2097818

Daneshyari.com