



Prophylactic strategy with herbal remedy to reduce puerperal metritis risk in dairy cows: A randomized clinical trial



Dongan Cui, Shengyi Wang, Lei Wang, Hui Wang, Xia Li, Yongming Liu*

Engineering & Technology Research Center of Traditional Chinese Veterinary Medicine of Gansu Province, Lanzhou Institute of Husbandry and Pharmaceutical Sciences of Chinese Academy of Agricultural Sciences, No. 335, Jianguoyuan Street, Qilihe District, Gansu Province, Lanzhou 730050, PR China

ARTICLE INFO

Article history:

Received 11 February 2015
Received in revised form
7 September 2015
Accepted 9 September 2015

Keywords:

Herbal remedy
Puerperal metritis
Prophylactic strategy
Cow

ABSTRACT

Puerperal metritis is an important disorders usually within 21 days postpartum in dairy cattle that occurs within 21 days postpartum, and herbal remedies are believed to be beneficial for postpartum female livestock. *Sheng Hua Tang* is a prime example of herbal formula used as a therapeutic aid in prevention or control of postpartum disease for centuries in China. In the present study, we were to evaluate the efficacy of *Sheng Hua Tang* as a prophylactic strategy for lowering puerperal metritis risks and improving reproductive performance in dairy cows under field conditions. A total of 311 clinically healthy cows were randomly allocated to the intervention group or the control group 2–4 h after delivery. Treated cows ($n=158$) received *Sheng Hua Tang* with an oral dose of 0.36 g crude herb/kg bw once daily for three consecutive days, whereas the controls ($n=153$) received no treatment. The logistic regression and survival analysis were used to analyze the incidence of puerperal metritis and reproduction parameters of cows between the two groups, respectively. The results showed that there was a significant reduction in the incidence of puerperal metritis (12.1% vs. 33.3%, $P=0.01$, odd ratio [OR] 2.392) between *Sheng Hua Tang* group and the control group. The calving-to-first-service interval (68.9 ± 17.7 days vs. 80.5 ± 26.6 days, $P < 0.05$) and service per conception (1.7 vs. 2.1, $P < 0.01$) were lower in cows in *Sheng Hua Tang* group than the controls. Additionally, *Sheng Hua Tang* treatment effectively elevated the first AI conception proportion (61.1% vs. 51.3%, $P < 0.05$) and proportion of cows that were pregnant at 305 days in milk (89.8% vs. 82.0%, $P < 0.01$) compared with that of controls. The present results would support efforts to the use of *Sheng Hua Tang* immediately after delivery as a prophylactic strategy for lowering puerperal metritis risk and improving the overall reproductive efficiency of dairy herds under these study circumstances. Thus, *Sheng Hua Tang* treatment could represent an effective prophylactic strategy for bovine postpartum care.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Puerperal metritis is a frequently diagnosed disease conditions within 21 d after parturition in dairy cattle, which is characterized by an abnormally enlarged uterus and a fetid watery red–brown uterine discharge, associated with signs of systemic illness, including fever (> 39.5 °C), dullness, inappetance and decreased milk production (Sheldon et al., 2006). It is considered to be one of the most important postpartum diseases in dairy cows due to impairing subsequent fertility and decreasing farm profitability (Markusfeld, 1984; Curtis et al., 1985; Fourichon et al., 2000; Drillich et al., 2003; LeBlanc, 2008; McLaughlin et al., 2013). Up to date, there is a lack of data on the efficacy of treatment of puerperal metritis for improvement of subsequent fertility, even

though certain progresses have been made towards the prevention or control of puerperal metritis in cows (LeBlanc, 2008; Haimerl and Heuwieser, 2014). Because of the infectious nature of puerperal metritis, antibiotic treatment is usually believed to be able to be beneficial for this condition (Smith et al., 1998; Drillich et al., 2001; Chenault et al., 2004; Goshen and Shpigel, 2006; Malinowski, et al., 2011). However, Trevisi et al. (2014) have proposed that production diseases of farm animals are complicated by the overuse of antibiotics and the generation of drug-resistant bacteria. Therefore, there is a significant need to encourage prudent use of antibiotics, which stresses the importance of alternative therapies and preventive measures for postpartum uterine disease in dairy cows. Certain herbal remedies are considered beneficial in prevention and control of postpartum disease associated with fertility in livestock in China (Song, 1988).

In traditional Chinese veterinary medicine theory, puerperal metritis and retained placenta both fall within the blood stasis syndrome category (Editorial Committee of Encyclopedia of

* Corresponding author. Fax: +86 931 2115268.
E-mail address: myslym@sina.com (Y. Liu).

China's Agricultural, 1991). Blood stasis is believed to be a key aspect of pathogenesis in postpartum diseases according to the traditional Chinese medicine theory (Luo, 1986; Lü et al., 1992) and many herbal agents with blood circulation-activating activities are usually used as a therapeutic aid to treatment postpartum disease in China (Chan et al., 1983; Luo, 1986; Chang et al., 2013). *Sheng Hua Tang*, a classical herbal formula consisting of *Radix Angelicae sinensis*, *Ligustici rhizoma*, *Semen persicae*, *Zingiberis rhizoma* and *Radix glycyrrhizae*, is a good example of a herbal formula that activates the blood circulation and removes blood stasis (Luo, 1986; Chang et al., 2013), and widely used as a therapeutic aid in prevention of postpartum disease in female livestock (Song, 1988). Our previous study (Cui et al., 2014) has demonstrated that the oral *Sheng Hua Tang* administration as a preventive treatment has beneficial effects in lowering the incidence of retained placenta and improving subsequent fertility in cows. It is generally accepted that retained placenta is associated with puerperal metritis (Sandals et al., 1979; Sheldon et al., 2008), and certain therapy for retained placenta can be effective for prevention and control of uterine infection following placental retention in cattle (Drillich et al., 2006; Goshen and Shpigel, 2006). Thus, the hypothesis of the present study is that the use of *Sheng Hua Tang* immediately after delivery as a prophylactic strategy would decrease the odds of puerperal metritis.

In the present study, we are to evaluate the efficacy of *Sheng Hua Tang* as a prophylactic strategy for puerperal metritis, and to assess the reproductive performance of the cows during the subsequent lactation under field conditions.

2. Materials and methods

2.1. *Sheng Hua Tang* preparation

Sheng Hua Tang used in our study was composed of 5 herbs – *Angelica sinensis*, 120.0 g; *Ligusticum chuanxiong*, 45.0 g; *Prunus persica*, 30.0 g; *Zingiber officinale*, 10.0 g; and *Glycyrrhiza uralensis*, 10.0 g – that was prepared as with a final concentration of 0.5 g crude herb/ml according to the procedure established by Cui et al. (2014).

2.2. Animals and enrollment criteria

The study was conducted from January 2011 to January 2013 in a commercial dairy farm of 850 lactating cows in northwestern China, and prior to this study the annual incidence of puerperal metritis in this dairy farm is 35.4%. Cows were housed in free-stall barns with cubicles, rubber mats and slotted floors, and were fed twice daily with a diet of total mixed ration (TMR) consisting of corn silage and grass forage, with corn meal, barley and mineral supplements based on the stage of lactation and milk yield according to NRC (2001). Fresh water was provided *ad libitum*. Cows were milked three times daily.

2.3. Enrollment criteria

The enrolled animals calved from January 2011 to March 2012 and were free of infectious or metabolic diseases and 3–7 years of age (2–5 lactations). Additionally, the cows with the risk factors abortion, dystocia, given twins were also enrolled in this study. They had a Body Condition Score (BCS) between 2.5 and 4.0 during the peripartal stage (Edmonson et al., 1989). For the purpose of the present study, dystocia diagnosis was established according to the protocol described by Schuenemann et al. (2011) with assistance score between 1 and 3 using a 1–4 scale (1=no assistance; 2=light assistance by one person without the use of mechanical

traction; 3=assistance with mechanical traction; 4=surgical procedure). Abortion was defined as the termination of a pregnancy of seven month or more, and the day of abortion considered the same as the day of parturition.

2.4. Exclusion criteria

Animals suffering from diseases such as cesarean section during previous or current calving, displaced abomasum, and laminitis were excluded from the study during the experimental period. In addition, cows with incomplete treatments or other deviations from the treatment protocol were also withdrawn from the present study.

2.5. Study design and clinical examination programs

This study was designed as a randomized controlled trial and our sample size was calculated to attain a power more than 80% in the test of association between puerperal metritis and exposure to *Sheng Hua Tang* 2–4 h after delivery. After completing the physical evaluation, all odd-numbered cows were allocated to the intervention group, and even-numbered cows to the control group. According to the treatment protocols described by Cui et al. (2014), the treated cows were received an oral dose of *Sheng Hua Tang* of 430 ml/600 kg bw (equal to 0.36 g crude herb/kg bw) within 2–4 h after delivery once daily for 3 consecutive days, and the controls received no treatment. Individuals involved in the diagnosis of uterine diseases were blinded to treatment allocation.

During the experimental period, placental expulsion was monitored at 2-h intervals by visually examining the perineum and no attempts were made to manually remove the placenta within 12 h postpartum. The uterine condition and placental expulsion were confirmed by vaginal and transrectal palpation at 12 h postpartum. The diagnosis of puerperal metritis was based on a complete physical examination of the cow including the general condition of the cow, rectal temperature, and palpation of the uterus per rectum to evaluate uterine discharge and uterus status according to the protocol described by Sheldon et al. (2006), cows having fetid, reddish-brown, watery vulvar discharge in combination with a rectal temperature > 39.5 °C were diagnosed as puerperal metritis. Evaluation of rectal temperature was performed before palpation per rectum, and vaginal examination was performed manually after thoroughly cleaning and disinfection of the perineal area with antiseptic solution. All cows, with a diagnosis of retained placenta or puerperal metritis conditions, received an oxytetracycline infusion administered to uterus (2000 mg in 250 ml of normal saline) every other day for 3 times according to usual management measures at the dairy farm in which we conducted the clinical trial.

All enrolled animals were monitored by clinically visible estrus signs starting from the day 25 following partus. Artificial insemination (AI) was performed within 12–18 h following observed estrus. If estrus did not occur at days 65 following birth, it was induced by i.m. injection of 0.4 mg cloprostenol sodium (2 ml: 0.2 mg, Suzhou SUMU animal medical industry Co. Ltd.). Pregnancy diagnosis was performed by rectal palpation of the uterus and its contents between days 40 and 50 following the last AI. Inseminations were performed throughout the year and cows not conceiving to the first AI were re-examined for pregnancy after each subsequent insemination between days 40 and 50 following AI.

The date of parturition, abortion, dystocia, twin, retained placenta, date of estrus, dates of artificial inseminations, number of AI's until pregnancy and health problems were recorded. To evaluate the effect of *Sheng Hua Tang* treatment on the reproduction performance of the cows during the subsequent

Download English Version:

<https://daneshyari.com/en/article/8502165>

Download Persian Version:

<https://daneshyari.com/article/8502165>

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