

Original Research Article

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## Comparative Evaluation of Some Herbal Therapies for Retained Placenta in Dairy Cows

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### ABSTRACT

The findings of a trial undertaken in dairy cows to evaluate the clinical efficacy of some polyherbal formulations in the management of retention of placenta are reported. Thirty cows were selected for the trial; the animals were divided into six groups, each consisting of five animals. The control group, T0, consisting of animals without retained placenta, was left untreated. In group T1, manual removal of the retained fetal membranes was practiced followed by intrauterine administration of two grams of oxytetracycline. Group T2 was treated orally with AV/UTP/23 premix (M/s Ayurvet Limited, India) @ 40 g twice on first day, followed by 20 g twice daily for the next three days. Group T3 was orally administered AV/UTL/17 liquid (M/s Ayurvet Limited, India) @ 50 mL twice on first day followed by 25 mL twice daily for the next three days. Group T4 was orally administered Brand A mixed with jaggery @ 100 g soon after calving and 50 g thereafter repeated every six hours till the placenta was shed. Group T5 was drenched Brand B @ 100 mL twice on first day and once daily thereafter for the next three days. The response to the treatments, recorded in terms of the time taken from parturition to complete release of the fetal membranes, was  $11.23 \pm 3.2$ ,  $11.01 \pm 1.1$ ,  $8.02 \pm 1.2$ ,  $9.14 \pm 1.22$ ,  $11.05 \pm 2.2$  and  $10.01 \pm 1.4$  hours in the groups T0, T1, T2, T3, T4 and T5, respectively. Similarly, first post-partum estrus was observed at 90, 60, 70, 85 and 80 days whereas the number of artificial inseminations required for conception was 3, 3, 2, 2, 2 and 2 in groups T0-T5, respectively. 204, 204, 100, 110, 125 and 120 open days were recorded in the groups T0-T5, respectively. Overall percentual conception was recorded at nil in the group T0 followed by 60, 80, 60, 60 and 40 in the groups T1-T5, respectively. Group T2, receiving treatment with AV/UTP/23 premix, showed the best reproductive and production performances. It could be concluded that treatment with herbal products was successful at improving productive and reproductive parameters in dairy cows. Further, among the treatments tested, the use of AV/UTP/23 premix was found most effective for the management of retained placenta under field condition.

#### Keywords

AV/UTL/17,  
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## Introduction

Post-partum period is a crucial transitory phase in bovine life when various physiological, gynecological, and biochemical changes occur. During this period, the animal is exposed to high risk of uterine infections as the anatomical barriers are breached and the genitalia remain open for various days (Goff and Horst, 1997). Retained placenta, also known as retained fetal membrane or retained cleansing, occurs when the calf's side of the placenta, *i.e.* the fetal membranes, fail to separate from the dam's side. Separation of the membranes normally occurs after the calf is born and early separation can be one of the causes of stillbirth. Normally, expulsion occurs within 3-8 h of the delivery of the calf. The incidence of the problem in healthy dairy cows is 5-15%. The incidence is increased by abortion, particularly with brucellosis or mycotic abortion, dystocia, twin birth, stillbirth, hypocalcemia, high ambient temperatures, advancing age of the cow, premature birth or induction of parturition, placentitis, and nutritional disturbances. Cows with retained fetal membranes are at an increased risk of metritis, displaced abomasum, and mastitis (Gilbert, 2015).

Retention of fetal membranes is mediated by impaired migration of neutrophils to the placental interface in the periparturient period. The impaired neutrophil function extends into the postpartum period and probably mediates the recognized complications of retained fetal membranes. Cows with retained fetal membranes have increased cortisol and decreased estradiol concentrations in late pregnancy. They may also have an altered prostaglandin (PG) E<sub>2</sub>:PGF<sub>2</sub> ratio. Uterine contractility is increased in affected cows. Lack of placental detachment, rather than uterine motility, is responsible for retention of fetal membranes. Once the fetal membranes have been retained

in the dam, subsequent infection of the uterus may be largely influenced by the balance between bacterial contamination, and the local and systemic immune status during pregnancy and parturition. Infectious diseases remain more prevalent during this period from an impaired immune status before and immediately after parturition (LeBlanc *et al.*, 2002). Indiscriminate usage of antibiotics for treatment of uterine infections has led to emergence of resistant strains. As a result of overuse and misuse of antibiotics, the focus has now shifted towards alternative treatments *viz.* herbal medicine (Hemaiswarya *et al.*, 2008; Abdisa, 2018).

The present study was undertaken to compare the efficacy of some polyherbal therapies and conventional antibiotic therapy for the treatment of retained placenta in dairy cows.

## Materials and Methods

The present study was undertaken in 30 dairy cows, divided into 6 equal groups (Table 1), raised at commercial dairy farms located in and around Nagpur, India (21.146° N, 79.088° E). The clinical trial, and all interventions and experimental procedures were approved by the Institutional Ethics Committee of the College of Veterinary and Animal Science, MAFSU, Udgir (Approval No. NVC/B-2/1446/16, dated 10.08.2016). Apparently healthy cows, ageing four to eight years, in their second to sixth calving seasons were recruited in the study. All animals were reared under similar environmental and managemental conditions and observed closely before, during and after parturition. The cows were calved in calving pens hygienically and kept in individual pens for 10 days after parturition. Starting as early as possible within 30 minutes of parturition, the calves were allowed to suckle for three days before separation from their dams. Per-vaginal examinations were performed to

detect fetal membranes and lochial discharge from day one until week six post-partum. Per-rectal examination of cows was performed until complete involution of the uterus. Both ovaries were examined per-rectally for the detection of ovarian structures. All cows were observed visually twice a day for the detection of estrus.

The parameters recorded were rectal temperature ( $^{\circ}\text{F}$ ), time elapsed (hours) from parturition to complete release of the fetal membranes, days to first post-partum estrus, number of inseminations required for conception, days open, conception rate, milk yield from days 0-120, and the risk of developing metritis, ketosis and mastitis. Statistical comparisons were made using ANOVA and, unless stated otherwise, all inferences were drawn at  $P \leq 0.05$  (Snedecor and Cochran, 1994).

## Results and Discussion

Retention of fetal membranes in cows is a very serious disorder, which has significant negative influence on health, welfare, milk productivity and further reproduction in the postpartum period (Laven and Peters, 1996). There is reduced milk production, delayed involution of uterus and subsequent delayed conception, early embryonic mortality, and problems like repeat breeding or even permanent infertility (Narasimhan and Deopurkar, 1994). In dairy cows, retained placenta may be the cause of serious economic losses to the farmers as cows with retained placenta may develop bacterial infection, become ill and, thus, suffer from reduced production (Tucho and Ahmed, 2017).

In the present study, the efficacy of some herbal uterine ecbolics and cleansers was evaluated in the management of retained placenta in dairy cows. The results of the

study have been summarized in Table 2. The time taken from parturition to the complete release of the fetal membranes was recorded at  $11.23 \pm 3.2$ ,  $11.01 \pm 1.1$ ,  $8.02 \pm 1.2$ ,  $9.14 \pm 1.22$ ,  $11.05 \pm 2.2$  and  $10.01 \pm 1.4$  hours in control, T1, T2, T3, T4 and T5, respectively, and a significant difference was observed in the time from parturition to complete release of the fetal membranes among different treatment groups. The time from parturition to complete release of the fetal membranes was significantly lesser in the group T2 in comparison to all other groups. Walia *et al.*, (2010) reported placental expulsion within 6-8 hours after treatment with herbal formulations whereas in the present study greater lengths of time were recorded, which may be due to hormonal influence as well as managemental factors. They could also report 83.3% efficacy of AV/UTL/17 with complete recovery in 10 of 12 cows suffering from either retained placenta, endometritis or postpartum anestrus.

Both hormonal and non-hormonal approaches have been adopted for the management of retained placenta; herbal formulations have been evaluated by many authors (Abdisa, 2018) and some herbal preparations, such as Exapar, are established to have superior therapeutic efficacy (Srinivas *et al.*, 1998). The use of certain plants and their preparations in fertility regulation, particularly as emmenagogues, and in various other reproductive ailments is very well documented in human Ayurvedic therapy (Perumal *et al.*, 2013). Manual removal of the retained fetal membranes causes an immediate and large but short-lived increase in PGFM, probably due to the physical damage of uterine tissue (Bolinder *et al.*, 1988), often resulting in more frequent and more severe uterine infections. Antibiotics, for example, broad-spectrum, long-acting oxytetracycline, when used to treat the infections, offer good prognosis but the

animal remains at increased risk of developing the condition again (Jesse *et al.*, 2016). Tetracycline antibiotics, commonly used for intrauterine treatment in cattle, tend

to inhibit matrix metalloproteinase (MMPs) and might, therefore, interfere with the normal placental detachment mechanisms (Eiler *et al.*, 1992).

**Table.1** Overview of trial design: Five healthy cows without retention of placenta served as control. Twenty-five cows suffering from retention of placenta were assigned to groups T1-T5

| Group (n=5)    | Treatment  |
|----------------|--|
| <b>Control</b> | Cows dropped their fetal membranes within the first 6-12 hours after parturition and did not develop any post-partum clinical disorders  |
| <b>T1</b>      | Manual removal of the RFM in addition to intrauterine insertion of 2 g Oxytetracycline   |
| <b>T2</b>      | AV/UTP/23 premix (M/s Ayurvet Limited): 20 g; double dose orally twice on day 1 followed by single dose twice daily on days 2-4  |
| <b>T3</b>      | AV/UTL/17 liquid (M/s Ayurvet Limited): 25 mL; double dose orally twice on day 1 followed by single dose twice daily on days 2-4   |
| <b>T4</b>      | Brand A: 50 g; administer one double dose orally mixed with jaggery (molasses) or feed soon after calving and single dose repeated after every six hours till the placenta is shed completely within 24 hours. |
| <b>T5</b>      | Brand B: 100 mL; single dose orally twice on day 1 followed by single dose once daily on days 2-4  |

**Table.2** Efficacy of herbal products as treatment option for retained placenta in dairy cows

| Group (n=5)    | Rectal temp (°F) | Parturition to complete release of the fetal membranes (hrs) | Days to first post-partum estrus | No. of AI required for conception | Reproductive parameters |        | Milk yield from days 0-120 | Incidence of complications |
|----------------|------------------|--|----------------------------------|-----------------------------------|-------------------------|--------|----------------------------|----------------------------|
|                |                  |  |                                  |                                   | Days open               | CR (%) |                            |                            |
| <b>CONTROL</b> | 101.5            | 11.23 ± 3.2 <sup>b</sup>                                     | 150                              | 3                                 | 204                     | Nil    | 8.01 ± 5.6 <sup>c</sup>    | Mild endometritis          |
| <b>T1</b>      | 101.6            | 11.01 ± 1.1 <sup>b</sup>                                     | 90                               | 3                                 | 204                     | 60     | 9.23 ± 1.2 <sup>b</sup>    | Nil                        |
| <b>T2</b>      | 101.5            | 8.02 ± 1.2 <sup>a</sup>                                      | 60                               | 2                                 | 100                     | 80     | 10.87 ± 4.4 <sup>a</sup>   | Nil                        |
| <b>T3</b>      | 101.5            | 9.14 ± 1.22 <sup>c</sup>                                     | 70                               | 2                                 | 110                     | 60     | 8.87 ± 32 <sup>d</sup>     | Nil                        |
| <b>T4</b>      | 100.5            | 11.05 ± 2.2 <sup>b</sup>                                     | 85                               | 2                                 | 125                     | 60     | 9.53 ± 3.1 <sup>c</sup>    | Nil                        |
| <b>T5</b>      | 101.4            | 10.01 ± 1.4 <sup>c</sup>                                     | 80                               | 2                                 | 120                     | 40     | 9.11 ± 4.3 <sup>b</sup>    | Nil                        |

Values bearing identical lower-case superscript do not differ significantly within columns

Besides its immediate negative effects on uterine health, retention of placenta is known to exert detrimental effects on post-partum reproductive and productive performance (Gohar *et al.*, 2018). In the present study, first post-partum estrus was observed on days 150, 90, 60, 70, 85 and 80 in control, T1, T2, T3,

T4 and T5, respectively. Number of inseminations required for conception was recorded at 3, 3, 2, 2, 2, 2 and 2 in control, T1, T2, T3, T4 and T5, respectively. Open days were recorded at 204, 204, 100, 110, 125 and 120 days in control, T1, T2, T3, T4 and T5, respectively. Conception rate was

recorded as nil in control and 60, 80, 60, 60 and 40% in T1, T2, T3, T4 and T5, respectively. Comparatively, group T2 showed better results in terms of reproductive indices than the other groups. Previously, Parmar *et al.*, (2017) recorded a significantly higher conception rate in the AV/UTL/17-treated group (83.33%) as compared to the untreated control (60%). Milk production was recorded from days 0 to 120; the average daily yield (litres) was  $8.01 \pm 5.6$  in control group, and  $9.23 \pm 1.2$ ,  $10.87 \pm 4.4$ ,  $8.87 \pm 3.2$ ,  $9.53 \pm 3.1$  and  $9.11 \pm 4.3$  in T1, T2, T3, T4 and T5, respectively. Clearly, group T2 showed better productive and reproductive performances than the other groups. Kaneko *et al.*, (1997) suggested that the conception rate at first service may not be related to occurrence of retained placenta but the more salient effect was more number of open days. Tucho and Ahmed (2017) also recognized decreased milk production and more open days as the main economic impacts of retained placenta.

There was no incidence of metritis, ketosis or mastitis in any of the treatment groups although mild endometritis could be recorded in the control group. Endometritis is a very common sequel to retained placenta. Antibiotics and estrogens have been used to treat, control or prevent the condition, but they are not routinely effective and may have deleterious side-effects (Peters and Laven, 1996).

In conclusion, the use of some herbal uterine ecboic and cleansing agents was found to be successful in improvement of the production and reproduction parameters in dairy cows suffering from retained placenta. Based on the findings of the study, it could be concluded that AV/UTP/23 premix @ 20 g with double dose orally twice on first day followed by single dose twice daily for next three days was effective for the prompt expulsion of retained

placenta, and improvement of post-partum reproduction and production in dairy cows.

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