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Comparative Study of the Three Different Times for Manual Removal of Retained Fetal Membranes in the Cow

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Abstract: The syndrome of retained placenta or Retained Fetal Membranes (RFM) is an important economic problem that affects cows in the farms of Iran and many other countries. For determine of the best time for manual removal of fetal membranes, from September 2002 to September 2005 a total number of 200 RFM cows in the farms of Tabriz (north-west of Iran) were identified and randomly divided to 4 groups of A, B, C and D. In the groups of A, B and C the fetal membranes were pulled out by manual traction on days 6, 7 and 8 postpartum (Day of parturition = 0), respectively. The rates of complete or incomplete removal of fetal membranes were recorded in each group. In the group of D (group of control), the fetal membranes were not removed by hand and the mean time of spontaneous expulsion of fetal membranes in this group calculated as M = 10.8 days. In the groups of A, B and C, the rates of complete removal of fetal membranes were recorded as 52, 76 and 100%, respectively. Significant statistical differences ($p<0.05$) were observed between group of C (day of 8th postpartum) and other groups. These results indicated that, from technical point the day of 8th postpartum is the best time for manual removal of retained fetal membranes in the RFM cows. In other word, due to the high probability of fetal membranes rupturing and remaining of the part(s) of placenta in the uterus and following complication, traction of retained placenta, before the 8th day of postpartum, is not recommended in the RFM cows.

Key words: Cow, manual removal, retained fetal membranes, retained placenta

INTRODUCTION

The syndrome of Retained Fetal Membranes (RFM) is an important economic problem that affects cows in the farms of Iran and many other countries. Theoretically, all cows that calve have Retained Fetal Membranes (RFM). Over three fourths of cows expel their placenta by 6 h and very few cows after 12 h postpartum. Detrimental effects on reproductive performance, milk production, postpartum disease and culling rate were detected when retention exceeded 12 h (Van Weren *et al*., 1993). In a study conducted in the Netherlands, the relative economic impact expressed in percentage was identified in four main areas: decreased milk production (40%), increased veterinary services (32%), increased culling rate (19%) and increased calving interval (9%) (Joosten *et al*., 1988).

Etiologically, detachment of the fetal membranes indicates that uterine involution is progressing normally. Involution of the uterus is accompanied by a massive breakdown of collagen and other proteins. Lack of cotyledon proteolysis (collagenolysis) appears to be the underlying cause of RFM. If placenta- anchoring systems are not enzymatically degraded, fetal membranes are retained (Eiler *et al*., 1992; Sharp *et al*., 1990). Many risk factors including: dystocia, abortion, premature parturition, infectious diseases, vitamin(s) or mineral(s) deficiencies and etc, are caused the retention of fetal membranes in the cow. But, determine of the main factor(s) in each case of RFM cow is a very difficult or impossible practice. Therefore, we have to treat all of the RFM cows by a unic approach. Manual removal of the fetal membranes is a very simple and effective approach, which is performed in the many of countries. But, when this method of treatment is used in the wrong time, due to the tearing and remaining the parts of membranes in the cow's uterine, consequently, septicemia and metritis will be occure. In the other hand, 50% of the retained fetal membranes are expelled spontaneously by day 5th postpartum in the cows (Eiler *et al*., 1993; Van Werven *et al*., 1993). Therefore, the manual removal of fetal membranes, before the day 6th postpartum, seems unreasonable.

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The objective of this research was determining the best practical time for manual removal of retained fetal membranes, in the cows which cause less complications.

MATERIALS AND METHODS

From September 2002-2005 a total number numbers of 200 RFM cows in the farms of Tabriz (north-west of Iran) were identified and randomly divided into 4 groups of A, B, C and D. These cows had a history of the fetal membranes retention for a period, longer than of 5 days. After restraining of the cows and their tails, vulva and perineal region were washed carefully with diluted chlorhexidine (3%). Then, with wearing the hands by disposable gloves, fetal membranes were pulled out by introducing a hand into the vagina, grasping the nearest parts of these membranes to the cervix and gently traction.

In the groups of A, B and C, the fetal membranes were removed on days 6, 7 and 8th postpartum, respectively and complete or incomplete removal of membranes were recorded. In the group of D (group of control), the fetal membranes were not removed by hand and these cows were allowed to expel their placenta by natural manner.

RESULTS

In the group of A (day of 6th postpartum), the rate of complete or incomplete manual removal of fetal membranes were recorded as 52 and 48%, respectively (Fig. 1). In the group of B (day of 7th postpartum) 76% of fetal membranes completely and 14%, incompletely were removed by manual traction (Fig. 1). In the group of C (day of 8th postpartum) all of the fetal membranes (100%) completely were removed manually (Fig. 1).

In the group of D (group of control) mean days of spontaneous expulsion of fetal membranes were calculated as M = 10.8 days (Fig. 2).

Collected data analyzed by statistical method of chi-square. Significant statistical differences observed between group of C (8th day of postpartum) and other groups ($p<0.05$).

We noticed that, the forces which were used for traction of fetal membranes in the groups of A and B, were more stronger than of forces used for group of C. In all cases of A and B groups, for prevention of fetal membranes tearing at the time of manual traction, introducing hand into the vagina was necessary. But in the group of C, in many cases, manual removal of fetal membranes were performed without vaginal touch. In other word, in this group in the many of cases, without doing the vaginal touch, fetal membranes were removed simply by traction of their external parts hanging from the vulva.

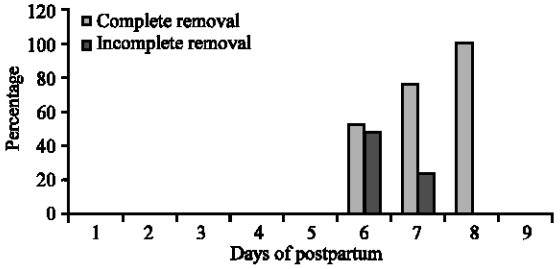

Fig. 1: Percentage of complete or in complete manual removal of fetal membranes in the groups of A, B and C

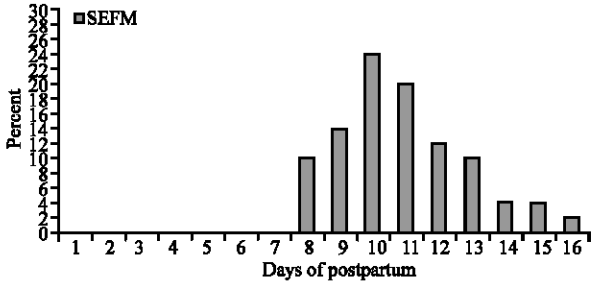

Fig. 2: Percentage of spontaneous expulsion of fetal membranes in different days of postpartum by cows in the group of D

DISCUSSION

Almost one half of RFM cows, spontaneously expel their placenta until the day of 5th postpartum (Van Werven *et al*., 1993; Eiler *et al*., 1993). These cows usually don't have serious problems and in many cases, owners don't refer these cows to veterinarians. Therefore, we focused on the second half of RFM cows which they had not been expelled their placenta by the day of 6th postpartum.

It is proposed that the biochemical disturbance leading to RFM may be triggered before or during delivery (Youngquist, 1997). The collagenolytic activity of cotyledon villi is decreased in cows with RFM (Gross *et al*., 1985) and there is persistence of type III collagen in cows with RFM (Sharp *et al*., 1990). These observations suggest that there is a deficiency of collagenase involved in the hydrolysis of type III collagenase (Eiler *et al*., 1993).

It is possible that RFM may also be due, in some cases, to the presence of an anticollagenase system in the placenta, since intraplacentome injections of collagenase

are unable to hydrolyze collagen in 15% of cows with RFM (Eiler *et al*., 1993). Several factors have been related to failure of cotyledon-caruncle detachment, including: hormone imbalances, trauma, abortion, cesarin section, twin birth, nutritional deficiencies, infectious diseases and etc (Hoedemaker *et al*., 1989; Peter *et al*., 1987; Slama, 1994, 1993; Goshowaki, 1998). After placental detachment is accomplished, uterine involution is completed in an average of 39 days in normal cows and 50 days in cows with FRM (Marion *et al*., 1968). By day 6 postpartum, caruncle septa are disorganized, by day 15, caruncles are completely sloughed due to necrosis (Archbald *et al*., 1972).

Consequently, RFM are detached by caruncle necrosis within 6-10 days and not later than 17 days postpartum. The surface of the edometrium is covered by new epithelium by day 26-30 postpartum (Paisley *et al*., 1986; Gier *et al*., 1968).

Many approaches have been used to detach RFM. These include manual removal, attachment of a weight to the membranes to speed expulsion and administration of uterokinetic drugs, sulfonamides, prostaglandins, antibiotics, antiseptics and hormones. None of these methods are effective in detaching RFM, however (Youngquist, 1997). A new approach for the treatment of RFM is the injection of collagenase into the umbilical arteries retrieved from RFM (Eiler, 1993). This treatment is safe but after the 48 h postpartum, don't effective (Eiler, 1992). In the other hand, due to the fetal membranes spontaneous expulsion in 50% of RFM cows by the day 5th postpartum (Van Werven *et al*., 1993) injection on of the collagenase to all of the RFM cows seems uneconomic program. Manual removal of retained fetal membranes is a very simple and effective approach, if performed at a suitable time of postpartum. Subject to precautions removing the membranes and following the best time window, this approach could be safe and helpful for the treatment of RFM cows. Our results indicated that the 8th day of postpartum is the best practical time for manual removal of retained fetal membranes in the cow, because in this time, the placenta is removed very easily and completely. Also, in this time, the cervix partially has been closed and external pathogens could not be introduced easily to the uterus by hands.

We recommend the traction of fetal membranes on day 8th of postpartum, because in this time, fetal membranes were necrotized previously and easily retracted by hands. In contrast, we refuse the traction of fetal membranes before the day 8th of postpartum, due to the high risks of fetal membranes tearing and following dangerous diseases and complications.

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