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INCIDENCE OF POST PARTURIENT UTERO-VAGINAL COMPLICATIONS IN DAIRY CATTLE: A REVIEW

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India possesses one of the largest livestock wealth in the world which comprises of 199 million cattle, 105.3 million buffaloes, 140 million goats and 71.5 million sheep. Even though, India is the largest milk producing country in the world, productivity per animal is less than 50 % of the world average. This is mainly due to poor level of nutrition and low genetic potential for milk production and health care. With ever increasing per capita consumption of milk in the country, there is increase in the domestic demand of milk. Hence therefore, crossbreeding is receiving more importance to overcome this gap. Crossbreeding of zebu cattle with exotic bulls of high merit for increasing productivity was initiated as a part of our breeding policy. The present economic condition demands that not only the individual animal be high producer but should be profitable too. However, the improvement of milk production in past few decades has not necessarily resulted in proportionate increase in profits to dairy farmers as animals with high milk production are prone to increased risk of exposure to health disorders.

Selection of dairy cattle has generally focused on increased milk yield, which can have an unfavorable effect resulting in increased incidence of disease. In a worldwide scenario reproduction disorders are common causes after low milk yield for culling of dairy animals. Antagonistic genetic correlations between milk production and disease traits indicate that disease incidence increases as a consequence of genetic improvement for milk production (Simianer et al. 1991; Neilson et al. 1997). Concern has been expressed that, if single trait selection of dairy cattle for milk production is continued, adverse effects may result, such as reproductive failure or increased incidence of health disorders. The present review focused on some important post parturient utero-vaginal complications in dairy cattle.

Retained Fetal Membranes

Bovine retained fetal membranes (RFM) have been defined as failure to expel fetal membranes within 8 to 12 hours postpartum. Retention of foetal membranes is a common postpartum complication in farm animals and, if untreated, is likely to result in permanent sterility due to pyometra, salpingitis, ovaritis, and severe damage to the endometrium etc. (Roberts, 1971).

Metritis

Metritis is the inflammation of the uterus. Metritis is mostly septic following parturition and is observed usually within 1 to 10 days after parturition. It is usually associated with removal of retention of foetal membranes, prolonged dystocia and abortion.

Endometritis

Endometritis is the inflammation of endometrium. The endometrium is the inner layer of the uterus.

Anestrous

The anestrous cows are those which do not exhibit signs of oestrous for 90 days or more after parturition. High incidence of infertility due to long post partum anoestrus condition in cattle is a major problem.

Repeat breeding

Animals which are exhibiting regular estrous cycles but fail to conceive after 3 or more inseminations are considered as repeat breeders.

Pyometra

Pyometra is an abscessed and pus-filled infected uterus. Toxins and bacteria leak across the uterine walls and into the bloodstream causing life-threatening toxic effects without treatment death is inevitable.

Effects of genetic group on the incidence of post parturient utero-vaginal complications:

Retention of foetal membranes

Sethi and Balaine (1978) reported 21.4 % incidence of retention of foetal membranes in Hariana cows and 22.9 to 28.2 % in crossbred cows with Holstein, Brown Swiss and Jersey bulls. However, Sinha et al. (1978) reported the incidence of retention of foetal membranes as 14.1 % and significantly higher incidence of retention of foetal membranes (61.4 %) was observed in parturitions associated with dystocia, still births and abortions in comparison to the uneventful parturitions (14.1 %). However, Pandit et al. (1981) found that the overall incidence of retention of foetal membranes in the herd of Gir cows and their crosses was 8.8%. Dutta and Dugwekar (1983) observed the incidence of retention of foetal membranes in cows and buffaloes as 18.46 and 4.69%, respectively. Agarwal et al. (1984) reported the incidence of retention of foetal membranes as 7.82 % among 460 calvings in crossbred cattle. However, Balasundaram (2008) reported high (18.67 %) incidence of retention of foetal membranes in Karan Fries cows.

Saloniemi et al. (1986) observed the incidence of dystocia, retention of foetal membranes and metritis as 0.9%, 4.5% and 2.3%, respectively in Finnish Ayrshire cattle. Saini et al. (1988) reported that the incidence of retention of foetal membranes was 17.48 % in different crossbred cattle of Holstein Friesian, Brown Swiss and Jersey with Hariana. Mukherjee et al. (1993) reported a high (15.57 %) incidence of retention of foetal membranes in Karan Fries cattle at NDRI herd. Satya pal (2003) calculated the incidence of retention of foetal membranes as 27.65 % in Karan Fries cows. However, Sharma (2010) reported overall incidence of retained placenta was measured as 0.25 %.

Metritis and Endometritis

Metritis is very important reproductive disorder which results in the huge economic loss to the farmer.

Kaikini et al. (1983) studied reproductive disorder in Holstein x Gir F1 crossbred cows and observed that the overall incidence of reproductive disorders was 36.50%. They observed that, most frequent disorder was metritis (8.76%) followed by placental retention (7.06 %), cystic ovaries (6.21 %) and dystocia (5.35 %).

Franz et al. (1988) reported the incidence of endometritis in German black Pied first ca1f heifers to be 20.7% and in cows as 17.4% respectively. However, high (14.11%) incidence of Metritis was reported by Mukherjee et al. (1993) in Karan Fries.

Satya pal (2003) reported the incidence of metritis as 29.7 % in Karan Fries cows. Kulkarni et al. (2002) obtained the incidence of metritis and endometritis 0.74% in indigenous Gir, halfbreds, ¾ breds and reciprocal crosses. However, Balasundaram (2008) reported the overall incidence metritis was the most severe reproduction disorder in both first calvers (28.90%) and all calvers (38.93%) in Karan Fries cow. Whereas, Sharma (2010) reported very less incidences of metritis (0.08%) and endometritis (0.02) in the same breed.

Effects of various non-genetic factors on post parturient utero-vaginal complications:

Pandit et al. (1981) found that parity wise difference in the incidence of retention of foetal membranes was highly significant ($P<0.01$) and incidence of retention of foetal membranes increased with increasing age in crossbred cows. They also revealed the significant effect of season on incidence of retention of foetal membranes.

Kaikini et al. (1983) worked on 96 Friesian x Gir F1 crossbred cows and showed that the incidence of reproductive disorders (mainly metritis and retention of foetal membranes) was lowest during third lactation and highest during fifth lactation. However, the incidence of retention of foetal membranes was affected significantly by season of calving and it was found highest in rainy season (Verma et al. 1986).

Saloniemi et al. (1986) found that the incidence of retention of foetal membranes, metritis and dystocia was lowest in second parity. Saini et al. (1988) observed that the incidence of retention of foetal membrane was significantly affected by season and parity, being highest in summer season as well as in first and second lactation. Mukherjee et al. (1993) reported the retention of foetal membrane to be less prevalent during first and second lactation while it was more prevalent during latter lactations. However, Bhagat Singh et al. (1997) found that incidence of retention of foetal membranes was significantly affected by season of calving. It was reported

that incidence of retention of foetal membranes was less among cows calved during summer and highest among cows calved during rainy season.

Sinha et al. (1978) observed that incidence of retention of foetal membranes was high during summer which was probably due to lesser number of calvings. Satya pal (2003) reported the incidence of retention of foetal membranes and metritis in Karan Fries cows was significantly affected by parity and period and the incidence was lower during first lactation compared to latter lactations. However, Balasundaram (2008) reported that none of the non-genetic factors (season, period and parity) had significant effect on incidence of metritis in Karan fries cow.

Sharma (2010) reported the effect of period and parity was statistically significant (PÜ0.01) on the retained placenta, metritis and endometritis in Karan Fries cows.

Genetic parameters of reproduction disorders:

Heritability estimates were reported by Mukherjee et al. (1993) for the abortion, still birth, retention of foetal membranes, metritis and dystocia as 0.23, 0.086, 0.068, 0.0155 and 0.143, respectively. Bolgov (1984) reported the similar (>0.06) results of estimates of heritability for abortion and still birth in exotic cattle.

Erb et al. (1959) and Yaillard and Charaz (1982) reported low heritability of retention of foetal membranes (0.16) and of dystocia (0.05 ± 0.01), respectively. However, low heritability estimates were also reported by Erb et al. (1959) of abortion (0.05) and still births (0.05); and by Yaillard and Charaz (1982) for still-births. Sethi and Balaine (1978) found low (0.20) heritability of retention of foetal membranes in Hariana cattle and moderate to high (0.26 to 0.55) for crossbreds. Saloniemi et al. (1986) reported the heritability of retention of foetal membranes, metritis and dystocia to be 0.03, 0.07 and 0.02, respectively in Finnish Ayrshire cows. However, findings of Franz et al. (1988) indicated that heritability of metritis ranged from 0.18 to 0.39 in German black pied first calf heifers.

Singh and Singh (1998) reported low estimates of heritability for abortion, still birth and retention of foetal membranes and were 0.066, 0.014 and 0.015, respectively. Heritability estimates for incidence of dystocia and prolapse were zero. Van Dorp (1998) reported heritability estimates of retention of foetal membranes and metritis as 0.01 and 0.02, respectively. However, repeatability estimates for abortion, stillbirth, retention of foetal membranes, metritis and dystocia were reported as 0.038, 0.024, 0.072, 0.103 and 0.153, respectively (Mukherjee et al. 1993). Sharma (2010) reported the heritability estimates of metritis as 0.24 ± 0.009 in Karan Fries cattle.

Inter-relationship amongst different post-parturient utero-vaginal complications:

Lin et al. (1989) found that Genetic correlations between dystocia, retained placenta, metritis, and mastitis were moderate in size and positive, whereas cystic ovaries were correlated negatively with dystocia and retained placenta. They also reported the genetic correlations were significant between dystocia and metritis (>0.8 for first parity and 0.28 for second parity cows) and between retained placenta and metritis (0.24 for first parity and >0.8 for second parity cows). However, Thompson (1984) reported that genetic correlations for retained placenta with milk fever (0.54) and mastitis (0.33) were positive; however, only the correlation with milk fever was significant.

Mantysaari et al. (1993) reported the genetic correlations between the first and the second lactation recordings for metritis was 0.58 and repeatability was 0.24.

Table 1. Genetic correlations among reproductive problems in Holstein Frisian cows (Lin et al., 1989).

Lactation group		Dystocia	Retained placenta
First calf heifers	Retained placenta	0.32	NE
	Metritis	0.95	0.24
Second lactation cows	Retained placenta	0.41	NE
	Metritis	0.28	1.19

NE- Not estimable

Effects of post parturient utero-vaginal complications on production and reproduction performances:

Sandals et al. (1979) studied the effect of retention of foetal membranes and metritis complex on reproductive performance. He revealed that the metritis complex, in the presence or absence of retention of foetal membranes, caused a significant increase in service per conception, calving to first heat intervals and days from calving to first service.

Pandit et al. (1981) reported that service period of the cows which showed retention of foetal membranes increased by 25.6 to 78.9 days. Mukherjee (1989) reported that the effects of metritis on 305 days milk yield, total milk yield was non-significant in Karan Fries cattle.

Simerl et al. (1992) found that the milk yield in first lactation to be depressed by retention of foetal membranes. A reduction in milk yield after retention of foetal membrane was also described by Heuer et al. (1999). Rajala and Grohn (1998) observed that retention of foetal membranes was significantly associated with decreased milk yield among cows in first parity. Satya pal (2003) reported that utero-vaginal disorders comprising retention of foetal membranes, metritis and dystocia had significant effect on lactation yield (2899.90 kg vs. 3408.86 kg) and lactation length (277.21 ± 10.79 kg vs. 309.02 ± 8.29 days) in Karan Fries cows.

CONCLUSION

Various studies revealed that the post parturient utero-vaginal complications in dairy cattle cows had significant adverse effect on 305-days milk yield as well as total milk yield. Also various non-genetic factors (season, period, parity etc.) affect the incidence of reproductive problems in dairy cattle. Therefore, proper management of high yielder is one of the important indicators of productivity is the total milk production during lactation as well as to reduce the incidence of post parturient utero-vaginal complications in dairy cow. However, in the Indian contest, a more extensive study of crossbred dairy cattle should be conducted regarding choice of mating system and its consequences in terms of economical or genetic implication of periodic introduction of exotic inheritance in halfbreds vis-à-vis selection and interbreeding in interbred group for minimizing incidence of post parturient utero-vaginal complications in dairy cattle.

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