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Effect of Parity of Animal and Season of Year on the Rate of Retention of Placenta in Dairy Cattle

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A B S T R A C T

A survey was conducted at IDF Nagla, Pantnagar, Uttrakhand from year 2003 to 2013 to observe the effect of season of year and parity of animal on the rate of retention of placenta in dairy cattle. All cases of retained placenta in dairy cattle were recorded and the analysis of data was conducted to assess the effect of season of year and parity of animal on the rate of retention of placenta. Cases of retention of placenta in primiparous animals were 88 and 251 in pleuriparous animals. The highest percentages of incidence of retained placenta was detected in spring and summer seasons (29.20% and 27.72% respectively, while the lowest percentage was noticed in autumn (20.94%). Rate of occurrence of retention of placenta is more common in pleuriparous animals than in the primiparous animals (heifers). The incidence of cases of retention of placenta was maximum in spring and summer season and minimum in autumn.

Introduction

Fetal membranes "placenta" is a vital organ for prenatal transfer of nutrients, oxygen and immunity from the mother to the fetus. It is normally expelled out with in short time post parturition. If the placenta is not expelled out within certain duration (12 hours post calving and 3 hours post foaling) (Mohamed *et al.*, 2009 and Taylor *et al.*, 2010), it is then defined as retention of placenta (ROP). This creates a number of problems such as, fever, weight loss, decreased milk yield, longer calving intervals and may result in an open cow during next year and if the infection is severe the animal may sometimes die. A retained placenta usually causes the cow to delay the next pregnancy for 2-6 months (Borel *et al.*, 2006). ROP causes high economic losses which are mainly due to infertility caused by uterine infections. It also leads to decreased milk yield and calf crop. The actual causes of ROP are not clear, but this condition usually occurs after dystocia, mal and unbalanced nutrition, stress, hereditary predispositions or infections. Since

there are many causes of ROP, there is no simple method for control and prevention. Basically we have to prevent the incidences of dystocia through good genetic selection of dam and sire having least probability for ROP, proper and good pre-partum nutrition schedule and exercise. Special care should be paid for nutrition and vitamin supplementation, especially during the dry period. Maintain a sound vaccination programme to minimize the chances of viral and bacterial abortions. Regular examination of the animal should be done for early diagnosis of dystocia. It could be concluded that ROP is an important problem which causes great economic losses and leave the animal sub-fertile even after treatment. So it is recommended to control the condition rather than to treat it.

The incidence of ROP varies from 4 – 16.1% in cow and it can be much higher in problem herds. It increases during summer with increased parity and following birth of male fetus (El-Malky et al., 2010; Ahmed *et al.*, 1999).

Also there observed no significant differences in retained placenta percentage between winter and summer feeding as well as between male or female birthing (Gaafar, 2010). Information regarding effect of season on rate of placenta would be helpful to reduce the cases of retention of placenta in herd. Thus the present study is planned to see the effect of season and parity of animal on incidence of ROP.

Materials and Methods

The present study was based on data collection; the data during 2003-2013 was taken from record book maintained at the office of the Instructional Dairy Farm Nagla, GBPUAT, Pantnagar. Data was analyzed and simple statistics was applied to derive the results.

Results and Discussion

Effect of parity of animal and season of year on the rate of retention of placenta in dairy cattle is depicted in Figure 2 and 3. In year 2003, the total cases of retention of placenta recorded at IDF Nagla were 40. 5% primiparous cows (02 in number) and 95% pleuriparous cows (38 in numbers) were recorded to be suffering from retention of placenta. 27.5% cases occurred in spring, 32.5% in summer, 7.5% in autumn and 32.5% in winter.

In year 2004 the total cases of retention of placenta recorded at IDF Nagla were 40. 22% primiparous cows (09 in number) and 77.5% pleuriparous cows (31 in numbers) were recorded to be suffering from retention of placenta. 32.5% cases occurred in spring, 25% in summer, 25% in autumn and 17.5% in winter.

In year 2005 the total cases of retention of placenta recorded at IDF Nagla were 29. 55.17% primiparous cows (16 in number) and 44.82% pleuriparous cows (13 in numbers) were recorded to be suffering from retention of placenta. 3.44% cases occurred in spring, 24.13% in summer, 37.83% in autumn and 34.48% in winter.

In year 2006 the total cases of retention of placenta recorded at IDF Nagla were 31. 25.80% primiparous cows (08 in number) and 74.19% pleuriparous cows (23 in numbers) were recorded to be suffering from retention of placenta. 45.16% cases occurred in spring, 29.03% in summer, 19.35% in autumn and 06.45% in winter.

In year 2007 the total cases of retention of placenta recorded at IDF Nagla were 44. 34.09% primiparous cows (15 in number) and 65.90% pleuriparous cows (29 in numbers) were recorded to be suffering from retention

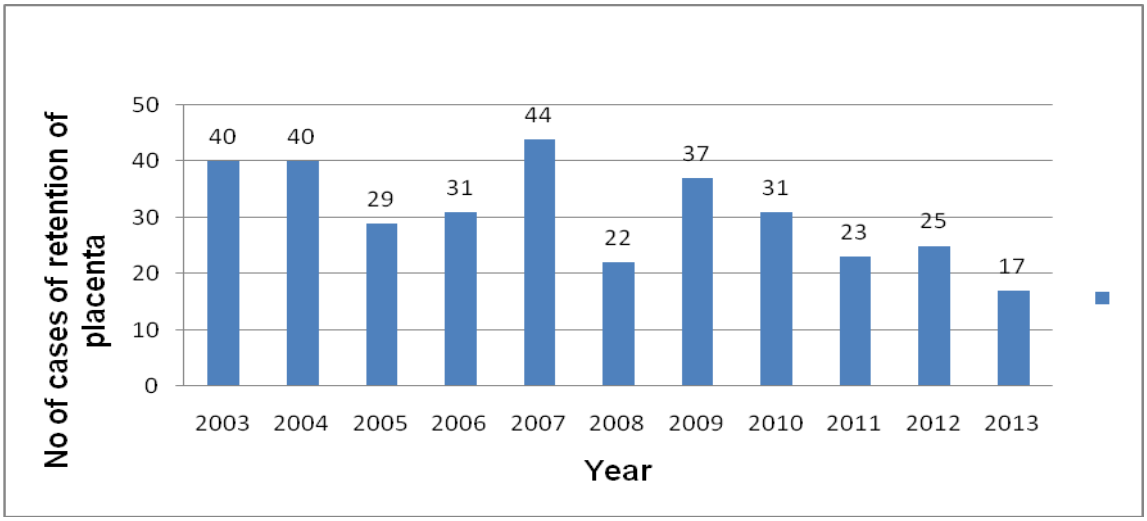
of placenta. 36.36% cases occurred in spring, 27.27% in summer, 20.45% in autumn and 15.90% in winter.

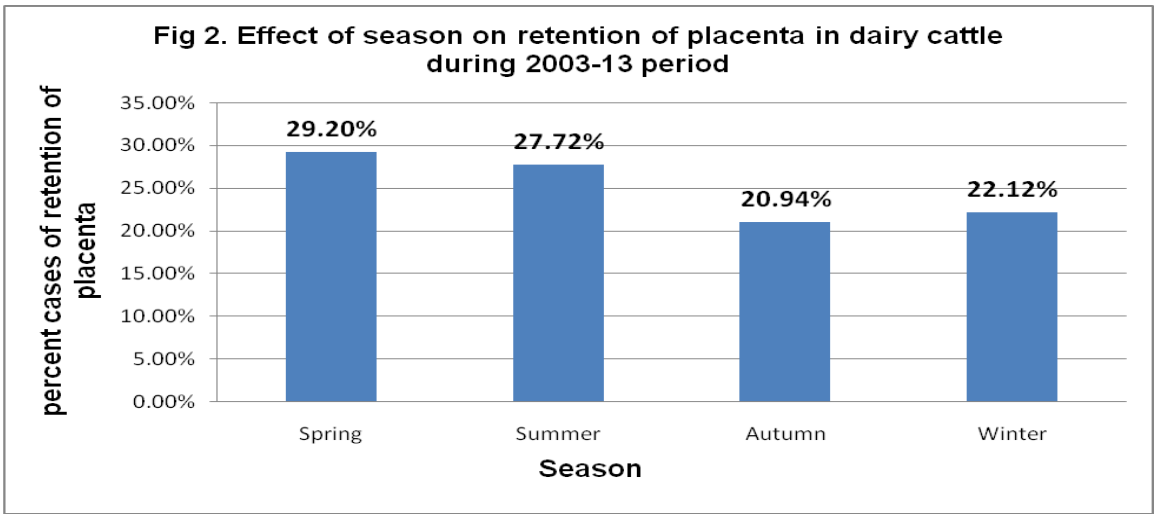
In year 2008 the total cases of retention of placenta recorded at IDF Nagla were 22. 13.63% primiparous cows (03 in number) and 86.36% pleuriparous cows (19 in numbers) were recorded to be suffering from retention of placenta. 40.9% cases occurred in spring, 18.18% in summer, 27.27% in autumn and 13.63% in winter.

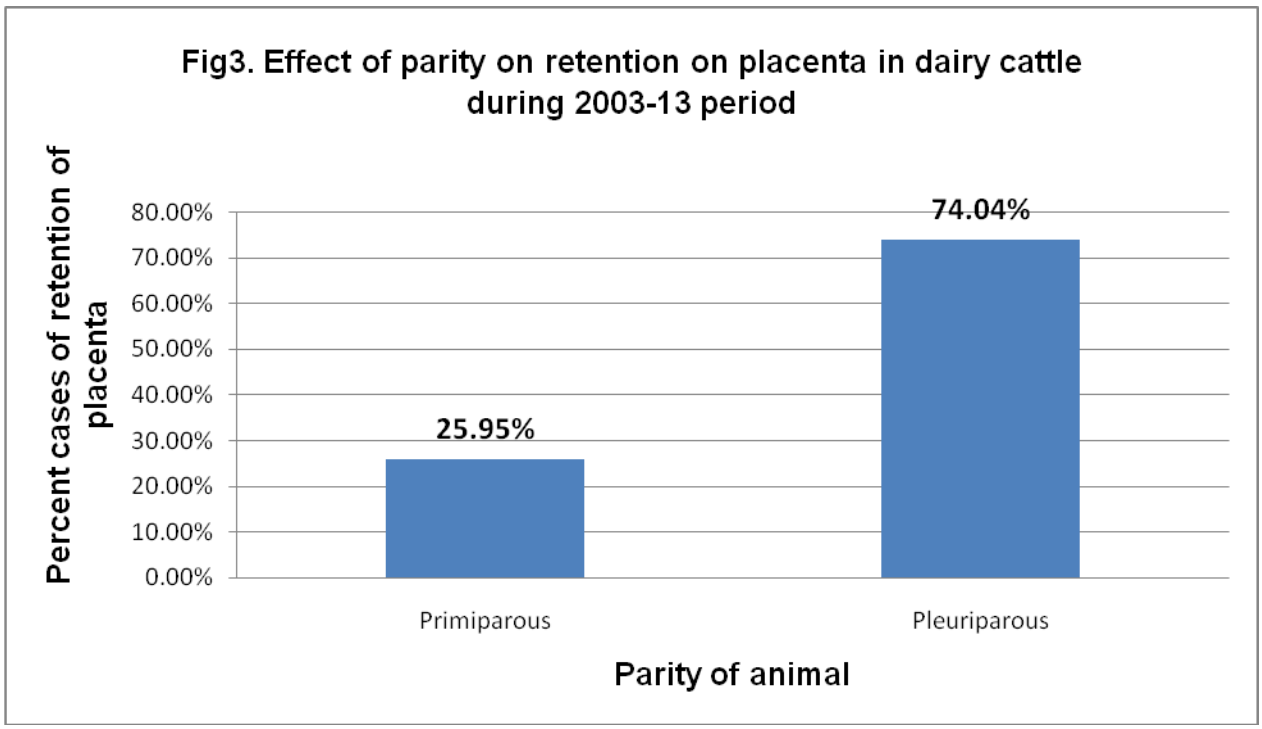
In year 2009 the total cases of retention of placenta recorded at IDF Nagla were 37. 37.83% primiparous cows (14 in number) and 62.16% pleuriparous cows (23 in numbers) were recorded to be suffering from retention of placenta. 18.91% cases occurred in spring, 29.72% in summer, 32.43% in autumn and 18.91% in winter.

In year 2010 the total cases of retention of placenta recorded at IDF Nagla were 31. 16.12% primiparous cows (05 in number) and 83.87% pleuriparous cows (26 in numbers) were recorded to be suffering from retention of placenta. 25.80% cases occurred in spring, 41.93% in summer, 16.12% in autumn and 16.12% in winter.

Fig.1 Retention of placenta cases in different years in dairy cattle







In year 2011 the total cases of retention of placenta recorded at IDF Nagla were 23. 34.78% primiparous cows (08 in number) and 65.21% pleuriparous cows (15 in numbers) were recorded to be suffering from retention of placenta. 17.39% cases occurred in spring, 30.43% in summer, 08.69% in autumn and 43.47% in winter.

In year 2012 the total cases of retention of placenta recorded at IDF Nagla were 25. 16.00% primiparous cows (04 in number) and 84.00% pleuriparous cows (21 in numbers) were recorded to be suffering from retention of placenta. 36% cases occurred in spring, 12% in summer, 12% in autumn and 40% in winter.

In year 2013 the total cases of retention of placenta recorded at IDF Nagla were 17. 23.52% primiparous cows (04 in number) and 76.47% pleuriparous cows (13 in numbers) were recorded to be suffering from retention of placenta. 41.17% cases occurred in spring, 29.41% in summer, 23.52% in autumn and 05.88% in winter.

From the period of 2003 to 2013, the total cases of retention of placenta were 339 (Fig. 1). 25.95% cases occurred in primiparous cows (heifers) and 74.04% in pleuriparous cows. 29.20% (99 in numbers) cases occurred in spring, 27.72% (94 in numbers) cases occurred in summer, 20.94% (71 in numbers) in autumn and 22.12% (75 in numbers) cases in winter.

The highest percentages of incidence of retained placenta were detected in spring and summer seasons (29.20% and 27.72% respectively), while the lowest percentage was noticed in autumn (20.94%). Similar results were obtained by Gaafar (2010), Atalah (1993), Deyab (2000) and Gabr *et al.*, (2005). The incidence of retention of placenta increases significantly with increasing body weight of cows, parity and body weight of calves born. There were no significant differences in the percentage of retained placenta between winter and summer feeding as well as between male or female birthing Gaafar (2010). Calvings during the summer or during periods of heat stress have been

associated with higher incidences of retained placenta. There is decreased incidence of retained placenta in autumn (Chassagne *et al.,* 2005).

The causes of the lower incidence in the fall season compared to hot season are due to the environmental and nutritional differences, e.g. temperature and concentrate to forage ration in the diet (Echternkamp and Gregory, 1999). Such seasonal differences in nutrition may influence placental development; placental growth (i.e., mass and net cellular proliferation) in the first half of gestation period (Ehrhardt and Ball, 1995). Calf birth weight and placental weight have been reported to be correlated positively in cattle (Echternkamp, 1993).

Above results reveal that the effect of parity on the incidence of retained placenta in dairy cows increases significantly from 1st parity onwards. It could be explained on the basis of the uterine muscles. These results are in accordance with those obtained by Karen (1996), Deyab (2000) and Gabr *et al.,* (2005). They reported that the incidence of retained placenta increased in old cows with parity over fourth. Most of researcher showed similar results.

Sarder *et al.,* (2010) showed the incidence of retained placenta at 1st parity, 2nd parity, 3 rd parity, 4th parity, 5th parity and >6th parity ware 8.5%, 13.3%, 6.1%, 9.4%, 20% and 28.7%, respectively which is closer to our study. Gaafar *et al.,* (2010) reported the incidence of retained placenta in Friesian cows increased significantly from 14.20% for 1st parity to 54.60% for 8th parity. Azad, (2010) reported the rates of retention of placenta in 1st, 2nd, 3rd and 5th parity were 15.0%, 15%, 33.3% and 37.5% respectively. Stevenson and Call, (1988) reported that retained placenta increases with advancing parity except in heifer.

Conclusion

By analyzing the above data, it was found that the rate of occurrence of retention of placenta is more common in pleuriparous animals than in the primiparous animals (heifers). The incidence of cases of retention of placenta is maximum in spring and summer season and minimum in autumn.

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Conflict of interest

There is no conflict of interest. The results are in accordance with the opinion of authors.

Authors' contribution

All authors contributed technically in carrying out this research and finalizing this article

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