

Analysis of Prevalence of Infertility in Cow of Selected Block of Sundarban Island in West Bengal

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ABSTRACT

The present study was conducted in the selected areas of Gosaba block of South 24 Paragans, a flood prone low land costal area of bay of Bengal during the animal health camps organized by Mobile Veterinary Clinics under the RKVY project (of RA-KVK, Nim-pith) for a period of two years. A total 1186 number of cows were investigated for infertility related problems in entire study period from August 2020 to July 2022. The cows were primarily considered as infertile or suffering from different reproductive problems as per anamnesis taken from owners. Those screened cows were further evaluated for specific forms of infertility. Higher prevalence of delayed puberty (38.11%) followed by anestrus (33.56%), repeat breeding conditions (27.15%), pyometra (0.67%) and other infertility related problems (0.51%) were observed

within the entire study period. Except delayed puberty, all other conditions were significantly ($p < 0.05$) higher in cross bred cows. Local non descriptive cows showed a significant ($p < 0.05$) higher prevalence of delayed puberty compared to cross bred cows. Cumulative prevalence of total infertility cases in autumn, summer, spring and winter season were 32.38, 30.52, 21.23 and 15.85% respectively. It was observed that prevalence of infertility related problems were significantly ($p < 0.05$) higher in autumn and summer compared to spring and winter. Total infertility related problems excluding delayed puberty was significantly ($p < 0.05$) higher between 2nd to 6th parity compared to 1st parity and above 6th parity.

Keywords Sundarban, Infertility, Prevalence, Season, Parity.

INTRODUCTION

Infertility is defined as temporary loss of fertility which resulting into failure or delay in producing the normal live offspring and can be because of anatomical, infectious, functional and managemental factors. Causes of infertility in cows in India are principally divided into hereditary and congenital, acquired, functional (anestrus, cystic ovary, luteal deficiencies and ovulation defects), nutritional deficiencies, infectious causes and miscellaneous causes (Thakur *et al.* 2006). It was reported that about 10 to 30 % of lactation yield may be affected by infertility and reproductive disorders and about 3 to 6 % of the herd is culled every year in developed countries for these problem, (Maji and Samanta 2013). Every missed heat leads to

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a loss of nearly Rs 500.00 in case of lactating cows and the loss is almost double in case of heifers of the poor farmers under Indian condition (Kutty 2000). In the field conditions the diagnosis and proper treatment of large animal infertility in India is not popularized. However, to prevent the production loss and increasing culling trends of the non productive animals, timely diagnosis and their mitigation is very important as day by day slaughtering of the cattle in India become prohibited (Sharma 2015). Anestrus, repeat breeding, cystic ovarian degeneration, uterine and tubal disorders have been observed as the most common gynaecological problems in cattle and buffaloes in Indian condition as per reports from different states (Agarwal *et al.* 2005).

Sunderbans island in West Bengal, comprising 19 development blocks and spread over two districts-South 24 Parganas and North 24 Parganas, is a largest mangrove swamp of the world (Dumrya *et al.* 2015). Livestock is one the potent livelihood assets of the peoples of this area as per farmers report infertility in the domestic animals is a common and predominant problems in this islands. So far reported, there are no such study was conducted in the sudarban area of the West Bengal on the light of the above facts, the present study was conducted to analysis the prevalence of infertility in cow of selected areas of the Sudarban island of West Bengal.

MATERIALS AND METHODS

The present study was conducted in the selected areas of Gosaba block of South 24 Parganas, West Bengal, a flood prone low land costal area of bay of Bengal. The study was conducted in the animals presented during the animal health camps organized by Mobile Veterinary Clinic under the RKVY project (of RA-KVK, Nimpith), Gosaba block, South 24 Parganas, West Bengal, for a period of two years. A total 1186 number of cows were investigated for infertility related problems in the entire study period from August 2020 to July 2022. The cows were primarily considered as infertile or suffering from different reproductive problems as per anamnesis taken from owners. Those screened cows were further evaluated for specific forms of infertility by clinical examinations, mostly per rectal and per vaginal examination

and the methodology followed by Kumar and Singh (2018). The data were analyzed by SPSS version 16.0 software packages for cumulative prevalence and chi square test. The results were presented as per cent.

RESULTS AND DISCUSSION

Prevalence of different infertility problems in cross bred and local non descriptive cows are presented in the Table 1. Total 1186 cows were screened as suffering in infertility problem and among them 452 cows (38.11 %) was showed delayed puberty. Total 398 cows were suffering in anestrus (33.56%) and 322 cows were suffering in repeat breeding conditions (27.15%). In case of clinical pyometra a total 8 cows (0.67%) were recorded. Other infertility related problems such as cystic ovary, metritis, endometritis, non specific genital infections were observed in 6 animals (0.51%) within the study period. Except delayed puberty, all other conditions were significantly ($p < 0.05$) higher in cross bred cows. Local non descriptive cows showed a significant ($p < 0.05$) higher prevalence of delayed puberty compared to cross bred cows. The results reported by Bhattacharyya *et al.* (2009) and Bhat *et al.* (2012) are in accordance with the findings of present study. Dutta *et al.* (2020) reported higher per cent of incidence of anestrus and lower per cent of incidence of repeat breeding case in field study compared to the present investigation. In another study Maji and Samanta (2013) reported higher percentage of incidence of repeat breeding and anestrus than present findings. Khan *et al.* (2016) found lower percentage of anestrus frequency and higher percentage of pyometra compared to our present observations. Variation of these results might be due to wide range variations of feeding, housing, reproductive

Table 1. Breed wise prevalence (%) of female infertility.

Breed	Delayed puberty	Anestrus	Repeat breeding	Pyometra	Others	Total
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Cross-bred	208 ^a (29.58)	256 ^b (53.00)	228 ^b (32.43)	6 ^b (0.85)	5 ^b (0.71)	703 ^b (59.27)
Local	244 ^b (50.52)	142 ^a (29.40)	94 ^a (19.46)	2 ^a (0.41)	1 ^a (0.21)	483 ^a (40.73)
Total	452 (38.11)	398 (33.56)	322 (27.15)	8 (0.67)	6 (0.51)	1186 (100.00)

Means bearing different superscript in a column differ significantly ($p < 0.05$).

Table 2. Season wise prevalence (%) of female infertility.

Season	Delayed puberty No. (%)	Anestrus No. (%)	Repeat breeding No. (%)	Pyometra No. (%)	Others No. (%)	Total No. (%)
Autumn	152 ^b (33.62)	133 ^b (33.41)	94 ^b (29.19)	3 ^b (37.50)	2 ^b (33.33)	384 ^c (32.38)
Summer	150 ^b (33.19)	134 ^b (33.67)	92 ^b (28.57)	3 ^b (37.50)	2 ^b (33.33)	382 ^c (30.52)
Spring	78 ^a (17.27)	72 ^a (18.09)	70 ^a (21.74)	1 ^a (12.50)	1 ^a (16.67)	222 ^b (21.23)
Winter	76 ^a (16.81)	56 ^a (14.07)	65 ^a (20.19)	1 ^a (12.50)	1 ^a (16.67)	198 ^a (15.85)
Total	452 (38.11)	398 (33.56)	322 (27.15)	8 (0.67)	6 (0.51)	1186 (100.00)

Means bearing different superscript in a column differ significantly ($p < 0.05$).

management, hormonal factors and most crucially climatic conditions (Dutta *et al.* 2020). However, all of those authors including Ashoo *et al.* (2020) and Asaduzzaman *et al.* (2016) were reported that the prevalence of infertility problems was lower in local breed than cross bred cows. This is in agreement with present findings. Noticeably a high prevalence of delayed puberty was observed in our investigation. These might be due to nutritional scarcity of those areas. Due to climatic change frequency of flood became increase in Sundarban, which increasing the soil salinity of the agricultural field. Less production of crop and fodders, and scarcity of animal feed turn the livestock illfed around the year (Das 2011, Mohit *et al.* 2015, Mukhopadhyay *et al.* 2021). The farmers are also less aware about feeding management of the livestock (Das *et al.* 2017).

Season wise prevalence of infertility cases in cows is presented in the Table 2. Cumulative prevalence of total infertility cases in autumn, summer, spring and winter were 32.38, 30.52, 21.23 and

15.85% respectively. It was observed that prevalence of infertility related problems were significantly ($p < 0.05$) higher in autumn and summer compared to spring and winter. Same incidence also reported by Bhattacharyya *et al.* (2009) and Bhat *et al.* (2012) in their investigations. In another study Khair *et al.* (2013) reported the lower incidence of reproductive problems of cow in winter season compared to summer and rainy seasons. In winter and spring season plenty of green grass and fodder might be nutritionally enriched the animals which further enhanced the reproductive performances of them (Shakeel *et al.* 2020). During the summer season, heat stress acted on the physiological homeostasis of animals lower down the reproductive performances (Wolfenson and Roth 2019, Dhara *et al.* 2020). However, Kumar *et al.* (2006) reported non significant effects of seasons on repeat breeding condition.

Parity wise prevalence of female infertility in cow is depicted in Table 3. Chi square analysis revealed that total infertility related problems excluding delayed puberty was significantly ($p < 0.05$) higher between 2nd to 6th parity compared to 1st parity and above 6th parity. These findings might be due to pick production period range which makes nutritionally deficient to the animals. Asaduzzaman *et al.* (2016) also recorded increasing trend of repeat breeding with increment of parity. In other study Bhat *et al.* (2012) reported higher repeat breeding prevalence in 2nd and 3rd parity compared to other parities. Another reason might be that older cows with higher parities may have large pendulus uterus due to repeated pregnancy related changes of uterus. Thus older cows may show repeated conception failure since small volume of frozen semen might not be enough to fertilize in the oviduct after traveling a long distance from uterus to horn by the spermatozoa (Asaduzzaman *et al.* 2016).

Table 3. Parity wise prevalence (%) of female infertility.

Parity	Anestrus No. (%)	Repeat breeding No. (%)	Pyometra No. (%)	Others No. (%)	Total No. (%)
1 st	83 (20.85) ^b	68 (21.12) ^b	0 (0.00) ^a	1 (16.67) ^a	152 (20.71) ^b
2 nd -4 th	143 (35.93) ^c	115 (35.71) ^c	2 (25.00) ^b	2 (33.33) ^b	262 (35.69) ^c
4 th -6 th	145 (36.43) ^c	117 (36.34) ^c	2 (25.00) ^b	2 (33.33) ^b	266 (36.24) ^c
Above 6 th	27 (6.78) ^a	22 (6.83) ^a	4 (50.00) ^c	1 (16.67) ^a	54 (7.36) ^a
Overall					734 (100.00)

Means bearing different superscript in a column differ significantly ($p < 0.05$).

However, Bhattacharyya *et al.* (2009) reported different conclusion that higher prevalence of anestrus in 1st parity compared to subsequent parities.

CONCLUSION

In the present investigation it was found that the cumulative prevalence of infertility related problems was significantly higher in the cross bred cows. The season also affected the prevalence of infertility of cow in the present study. During summer and autumn the prevalence was significantly higher compared to winter and spring. It was also observed that the delayed puberty was a common problems followed by anestrus and repeat breeding in these area. Total infertility related problems excluding delayed puberty was significantly ($p < 0.05$) higher between 2nd to 6th parity compared to 1st parity and above 6th parity.

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