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Factors affecting anestrus in dairy cows at the rural areas in Bangladesh

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Abstract:

Rural people of Bangladesh rear cow mainly for milk production. Milk production is related with parturition. There are many cow suffering from reproductive disturbance like anestrus that delayed conception and parturition. Therefore it is necessary to uncover the factors those are affecting anestrus in dairy cows. Present study was conducted to detect anestrous in dairy cow through rectal palpation of ovarian cyst and its therapeutic management at the rural areas of Bangladesh. In this investigation a cattle group of 46 indigenous and cross bred cows of first to fifth parturition with poor to moderate BCS and age between 2.5-7.5 years were examined. Data related to age, breed, parturition and insemination type were recorded in a registrar book. 35 cows were examined in upazila veterinary hospital and 11 cows in some small sized dairy farms of Bera upazila, Pabna, Bangladesh. The presumptive diagnosis of anestrous through rectal palpation and its therapeutic management was found effective.

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The ovaries of those cows were examined through rectal palpation where 58.70% were suspected as nutritional anoestrus whereas Follicular and luteal cysts were 19.57% and 13.04% respectively. Anestrous due to ovarian hypoplasia were diagnosed in 8.69% cows. Old cross bred cows (69.57%) ages between 5.5 to 7.5 years were more susceptible to anestrous than that of 2.5-5.5 years indigenous cows (30.43%). Cows affected from follicular cyst were treated with 2.5 ml intramuscular injection of GnRH hormone {Fertilon(R)} and cows affected from luteal cyst were treated with 5 ml intramuscular injection of PGF2α {Dinoprost(R)} and prognosis were recorded as 66.67% and 50% respectively. Ovarian hypoplasia and none recognized cases were first treated with Inj. Fertilon(R) 2.5 ml intramuscularly and after 10-12 days Inj. Dinoprost(R) 5 ml intramuscularly and 75 % cases showed positive response. Our results reflects the present scenario of anestrus and its management. Further study on pathophysiological mechanism of ovarian cyst that leads the anoestrus in dairy cows can give a new window to fight against anestrus in dairy cows.

Key words: Anoestrus, rectal palpation, ovarian cyst & treatment.

1. Introduction

Postpartum ovarian activity and subsequent conception may be affected by several factors such as breed, nutrition plan, milk yield, suckling, uterine involution, season of calving (Baruselli, 2001; Pipaon *et al*., 2002).Milk yield and dairy herds' fertility are of major economic importance for a dairy farmer. In order to gain maximum profit, calving intervals should not exceed 365 days. The achievement of a 365-day calving interval requires an early resumption of ovarian activity, excellent estrus detection, and a high first-service conception rate. Especially the inability to detect estrus and to mate the cows by 60 to 80 days after calving is a common problem among dairy farmers nowadays (Opsomer *et al.,* 1996). It is established that many cows suffering from reproductive disturbance like anoestrus that delayed conception and parturition. Nutrient balance affects the resumption of ovarian cyclic activity following calving in dairy cattle (Mc Dougall *et al.,* 2005). On the other hand cystic ovary is another major cause for anoestrus in dairy cows in rural areas of Bangladesh. There

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are several types of cysts that can be found in the ovaries of the cow which have a significant impact on the reproductive efficiency. The cystic structures that were studied include follicular cysts, luteal cysts and ovarian hypoplasia. Rectal palpation of the ovaries and its response to locally available drugs used as a treatment of those diseases was another consideration. This was performed through the presentation of pertinent information on the cystic ovarian conditions. Throughout the report, the different types of cysts are compared and contrasted in their characteristics, causes, and treatments so that connections are made between the different, yet remarkably similar, conditions. The importance of studying cystic conditions lies in the consequences it has for the dairy producer. As most cysts are an ovulatory, they cause severe delays in the reproductive efficiency of affected animals, leading to decrease milk production over time. This inevitably can affect the bottom line and cause the dairy producer to lose money. Because of the significant impact that cysts can have, they should be understood completely so that the most effective diagnoses can be made and treatments administered in order to prevent unnecessary losses from the farm. Actually anoestrus is in fact a very broad term that indicates the lack of the typical estrus expression at an expected time (Hopkins, 1986). In this study, in which emphasis was given about the anoestrus problems in local and available cross bred dairy cows after calving, the term anoestrus covers all cows not seen to be in heat after a certain time after calving. In this context, also estrus detection failures by the herdsmen have to be seen as a part of the problem.

2. Materials and Methods

2.1. Study area and duration

The study was conducted at Upazila livestock office of Bera, Pabna and some small size dairy farms of its surrounding areas. It was conducted from August' 2014 to April' 2015.

2.2. Animal selection and management

A total number of 46dairy cows(16 local and 30 cross bred cows) were examined through rectal palpation for the detection of anoestrus. The as usual management systems for summer session in the local areas of Bangladesh was considerable during the study period. At the time of breeding 38 cows were bred through AI, 5 cows through natural insemination and artificial insemination (AI) was initially used with natural mating towards the latter part of the breeding season for 3 cows. Heat detection for AI mainly consisted of frequent observation (early morning, throughout the day and late evening) but tail-painting was also used to a varying extent.

2.3 Method used and data collection

The histories of the cows were recorded in the registrar book. Anoestrus in the cows were diagnosed through rectal palpation. The condition of the ovaries were listed in the book and compared with the history. Data related to age, breed, parturition, milk yield, insemination type were recorded. Farmers complain and history of previous treatment was taken under consideration during diagnosis and treatment of the diseases. Regular follow-up of the patient and prognosis were recorded carefully.

2.4. Experimental design

Cow showing no estrus in ≤ 85 days after parturition was considered as anoestrus cow. Rectal palpation of these cows was done to identify the cause(s) of anoestrus. In some cases anoestrus were detected due to persistent corpus luteum which was treated with PGF2α

(Dinoprost[(R)]). Some cows showed anoestrus due to follicular cyst which was treated with GnRH (Fertilon[(R)]) where as some were identified without any cyst. In those cases the cows first was treated with GnRH and advised to supply some concentrated feed. Then PGF2α was given after 10 days of the first treatment. The same treatment was given to the cows suffering with ovarian hypoplasia. All the cows were under close monitoring by the farmer and authors. After detection of heat the cows were breed with bull. In some cases AI was performed along with natural breeding. After 3-5 months the inseminated cows were diagnosed as pregnant.
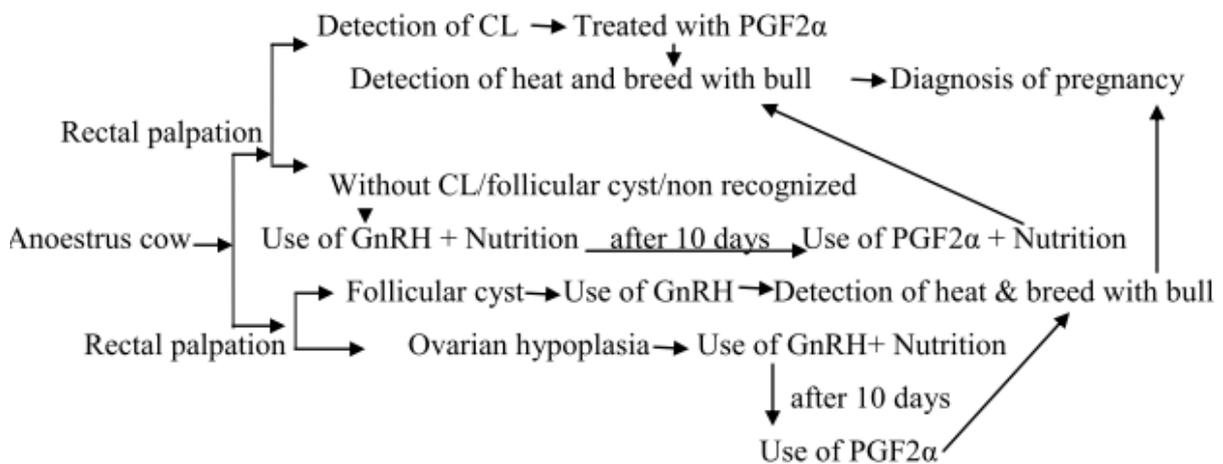
2.5.Statistical analysis

Raw data were recorded, entered and stored using the MS Excel for descriptive statistics to determine the factors affecting anestrus. Differences in percentages of different parameters were analyzed by graphical and tabular methods.

3. Result and Discussion

The incidence of cystic ovaries appears to be related to a variety of traits like age, parturition, breed, insemination type and milk yield in dairy cattle. In the present study it was recorded that the cystic ovaries are more prevalent in high lactating cross bred cows (69.57%) than

those of indigenous cows (30.43%). These cross bred cows mainly derived from crosses of local cows with Holstein-Friesian, Jersey and Shahiwal at their different generation. Coleman (1831) reported that Cystic ovarian disease was more common in Holstein-Friesians than in Jersey, Guernsey or Ayrshire cows and varied among sire-lines within breed. Through the study of insemination type and use of semen during insemination the present study concluded that cross of local and Holstein Frisian are more susceptible to ovarian cyst. The history of the disease, health status of the animal, feed quality and feed supply level to the dairy cows in village areas were recorded poor. In case of indigenous cows this condition was found weaker. Actually in the study areas the small scale dairy farmers reared a large number of cross bred cows and most of the farmer depends on open field to collect grasses. On the other hand they poorly supply straw along with succulent feed. For this reason, about 58.70% (27) of the dairy cow suffering from malnutrition and subsequently anoestrus. These animals were treated first with anthelmintic and then minerals, vitamin A and E along with a good ration. It was found effective in 55.56% cases. This result was in agreement with Hurley *et al.,* (1982) who reported that deficiency of mineral-phosphorus and vitamin A and E cause anoestrus. In this experiment it was recorded that cows between 2.5 -7.5 years of ages are susceptible to anoestrus, but incidence was greater (32.61%) in cows between 6.5-7.5 years of age. So occurrence of ovarian cyst rises with age in dairy cattle. Allrich (2001) reported that mature cows have a higher incidence (39%) of ovarian cysts than do first-calf heifers (11%). Cows during their fourth and fifth parturition i.e. when milk yield is often greatest showed higher incidence like 28.26% and 39.13% respectively. The condition was also commonly diagnosed 1-4 months after calving. It was thus suspected that lactation stress is a predisposing factor but Chapman *et al.,* (1975) found no correlation between the two factors. They reported that the incidence of cystic ovaries increased from 8.4% in primiparous cows to 25.9% in cows in

their fifth lactation. The incidence overall was also higher in cows with metritis (14.6%) and those with retained placenta (13.6%) than in healthy cows (8.5%). Other factors influencing incidence were prolonged interval from calving to first detected estrus, first mating and conception, and the interval from first detected heat to conception. Some dairy heifers may be stressed or low on the 'peck order', which causes anestrus or sub estrus. In the present study the prevalence of follicular cyst was higher (19.57%) than luteal cyst (13.04%) which was in agreement with the study of Allrich (2001). Soonwuk et a1.,(1996) examined 800 cows and observed 24% luteal cyst, 10% follicular cyst, 1% persistent CL and 0.6% ovarian adhesion. Bierschwal (1996) found the incidence of ovarian cyst was 11 to 17% in dairy cows. On the other hand Allen (1997) reported that ovarian follicular cyst is an ovulatory follicular structures that occur in 10 to 13% of dairy cows. In the present study ovarian hypoplasia was recorded in 8.69% (4) cows. Cows (9 in number) suffering from follicular cyst were treated with 5 ml intramuscular injection of gonadotropin hormone {Fertilon[R]} and positive results were recorded in 6 cows which was 66.67%. It was supported by Armstrong(1986) who noted that stress may disrupt the hypothalamohypophyseal system resulting in disruption of the normal pattern of gonadotropin secretion or may alter ovarian function. On the other hand, cows (6 in number) affected from luteal cyst were treated with 2.5 ml intramuscular injection of PGF2α {Dinoprost[R]} and positive response was recorded in 3 cases which was 50% of the total cases. Ovarian hypoplasia and non-recognized cases (4 in number) were first treated with Inj. Fertilon[R] 5 ml intramuscularly and after 10 days Inj. Dinoprost[R] 2.5 ml intramuscularly and 75 % cases (3 in number) showed positive response.

Hormonal treatment is the only perfect solution of ovarian cyst. Currently, gonadotropin releasing hormone (GnRH) is the most frequently recommended treatment for cows with ovarian cysts because it causes the pituitary to release FSH and LH for follicular growth,

development, maturity and does not result in antibody formation. Because a high proportion of cysts spontaneously regress during the early postpartum period, treatments are usually not administered until after 30 days postpartum. The GnRH treatment causes luteinization of the cyst, and the subsequent prostaglandin treatment of the luteinized cyst causes regression of that structure.

4. Conclusion

Ovarian cysts reduce reproductive efficiency in dairy herd. Large numbers of dairy cows suffering from anoestrus in different regions of Bangladesh. Further ultrasonography investigation of the ovary and study on pathophysiological mechanism of the ovarian cyst can give a great inside and solution of anestrus in dairy cows.

Acknowledgement

Author contribution

All authors equally contribute to the experimental design, methodology selection, data collection and analysis, write up the manuscript and finally approved the manuscripts.

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Table 1. Factors pertaining anestrus in dairy cow

Parameters	Factors	Number of cows	Percentage (%)
Causes	Nutritional cause	27	58.70
	Follicular cyst	9	19.57
	Luteal cyst	6	13.04
	Ovarian hypoplasia	4	8.69
Age (years)	2.5-3.5	4	8.70
	3.5-4.5	3	6.52
	4.5-5.5	10	21.74
	5.5-6.5	14	30.43
	6.5-7.5	15	32.61
Parturition	1st	2	4.35
	2nd	5	10.87
	3rd	8	17.39
	4th	13	28.26
	5th	18	39.13
Breed	Indigenous	14	30.43
	Crossbred	32	69.57
Insemination type	AI	38	82.61
	NI	5	10.87
	NI + AI	3	6.52

AI: Artificial insemination, NI: Natural Insemination
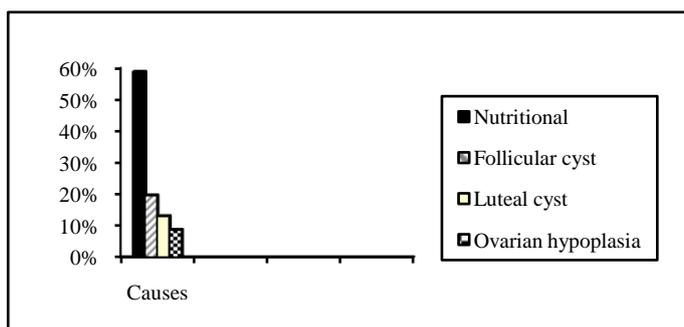
Figure 1. Graphical presentation of prevalence of different causes of anestrus in dairy cow
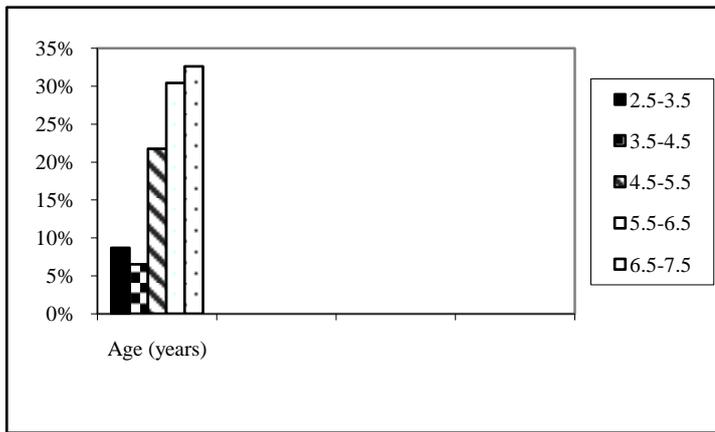
Figure 2. Incidence of anestrus in different age groups of dairy cow
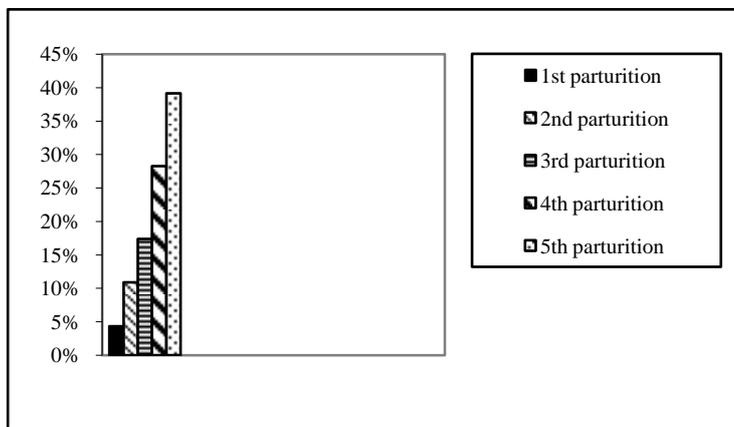
Figure 3. Incidence of anestrus in different parturition of dairy cow
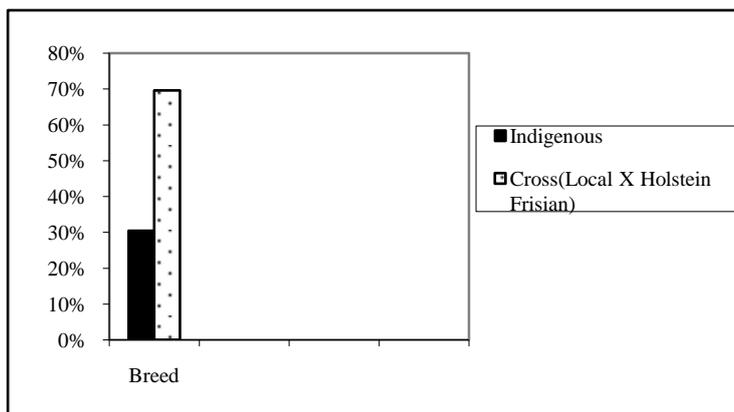
Figure 4.Incidence of anestrus in dairy cow according to breed

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