

Research Article

PREVALENCE OF VARIOUS ETIOLOGICAL FACTORS RESPONSIBLE FOR CAUSING INFERTILITY IN COWS OF HIMACHAL PRADESH, INDIA

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ABSTRACT: A total of 1161 animals were examined in 60 clinical camps for detection of gynecological problems. Among those animals, 930 (80.10%) animals were infertile due to different reproductive disorders and 231 (19.89%) animals were either normal cyclic (55; 4.74%) or were found pregnant/recently calved (176; 15.16%). Out of 930 affected animals 899 were infertile (77.43%) or were suffering with different miscellaneous reproductive disorders (31; 2.67%). Among 899 infertile animals, 445 (38.33%) animals were repeat breeders, 454 (39.10%) were anestrus. In 445 repeat breeder animals, 319 (27.48%), 59 (5.08%), 18 (1.55%) and 49 (4.22%) animals were suffering with endometritis, cervical pathologies, fallopian tube defects and prolonged estrus, respectively. Out of 454 anestrus animals, 63 (5.43%) were silent estrus and 391 (33.68%) cases were of inactive ovaries.

Key words: Prevalence, Repeat breeding, Anestrus, Infertility.

INTRODUCTION

Infertility is temporary loss of fertility which results in failure to produce or delay in producing the normal live calf and can be because of anatomical, infectious, functional and managemental reasons. It is one of the important factors of life time performance of a cow which depends upon the normal functioning of the reproductive system and any impairment in the functioning of reproductive system will result in infertility and sterility in these animals (Noakes *et al.* 2009). Causes of infertility in cows in India or even in Himachal Pradesh are 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 is already reported that 10-30 % of lactation yield may be affected by infertility and reproductive disorders and 3-6 % culling rate per year in developed countries is because of these reasons (Erb and Martin 1980). As per the ICAR report, 2002 due to infertility or sterility approximately 18-40 % cattle are culled every year in India. However, in our neighboring country Pakistan a significantly ($p < 0.05$) lower culling rates have been observed in cattle (23.0%) than buffaloes (77.0%) (Khan *et al.* 2016).

Cattle become infertile when they are neither completely sterile nor fertile and are irregular for production of annual live calf. Although infertility is a complex and multifactor problem, anestrus and repeat breeding have been identified as the main factors responsible for this malady (Parkinson 2009). However, in India as slaughtering of cows is prohibited and has become one of the most important reasons for culling of dairy cattle due to extra expenditure on rearing, feeding, treatment and breeding of such animals. Such animals are finally left stray on the roads (Sharma 2015). So, keeping in view a study was carried out through clinical camps in different districts of Himachal Pradesh to rule out various reasons of infertility.

MATERIALS AND METHODS

The present study was carried out in different districts of Himachal Pradesh with a range of altitudes ranging from 200 m to 3650 m above mean sea level. Overall, 1161 cows were examined through per-rectal examination. All the examined animals were placed in different categories of various reproductive disorders depending on per-rectal examination *viz.* repeat breeders, anestrus, normal cyclic and other miscellaneous reasons of reproductive disorders. Cows which are not conceiving

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in spite of three or more subsequent insemination were categorized into different categories of repeat breeding such as endometritis, cervical pathologies, fallopian tube defects and prolonged estrus etc. and the animals which are not showing apparent signs of estrus even after maturity and calving up to 90 days of calving were placed in the different categories of anestrus such as inactive or smooth ovaries *i.e.* true anestrus or small genitalia and silent estrus. The miscellaneous category of reproductive disorder includes abortion and other disorders like pyometra, mummification, maceration etc. and the cows which were found pregnant and observed in estrus were placed in normal cow's group. In repeat breeder and anestrus categories, the different subcategories are defined as below and tabulated in Table 1.

Endometritis: These categories of animals were showing turbid genital discharge at the time of estrus. The turbid discharge included the discharge away from transparent color such as purulent, mucopurulent, yellow and red etc.

Cervical pathologies: Any enlargement, hardness found in the cervix was categorized into cervical pathologies. Some of the cervical pathologies were diagnosed due to non-patency of cervix after passing of AI gun.

Fallopian tube defects: The fallopian tube defects like salpingitis was diagnosed by palpation of hard cord formation of fallopian tube from uterine horn tip to ovary. The ovaro-bursal adhesions were diagnosed by palpation of ovarian surface. If ovary was attached with bursa and was not lifted during manual examination, the condition was diagnosed as ovaro-bursal adhesions.

Prolonged estrus: Any animal which was showing signs of estrus more than 48 hours was categorized into category of repeat breeder due to prolonged estrus.

True anestrus/small genitalia/Post-partum anestrus: In this category all the animals which were showing smooth ovaries with no palpable structure and also had included the animals which were not showing signs of estrus after calving up to 90 days were included. Ovarian examination was carried out through per-rectal examination.

Silent estrus: The animals which not showing external signs of estrus but were found to had some structure on ovary through per-rectal examination *i.e.* ovary was having either corpus luteum or follicles.

RESULTS AND DISCUSSION

The prevalence of various etiological factors responsible for infertility in cows of Himachal Pradesh is shown in Table 1. Perusal of the table indicated that among various etiological factors the highest incidence had been recorded for anestrus (39.11%) followed by

Table 1. Prevalence of various etiological factors responsible for infertility in cows of Himachal Pradesh, India.

Diagnosis	Type of problem	No. of animals	(%)
Repeat breeder	Endometritis	319	27.48
	Cervical fibrosis/Kinked Cervix/cervicitis	59	5.08
	Ovaro-bursal adhesions/Salpingitis	18	1.55
	Prolonged Oestrus	49	4.22
	Total	445	38.33
Anestrus	True Anoestrus/Small Genitalia/Post- Partum Anoestrus	391	33.68
	Silent oestrus	63	5.43
	Total	454	39.11
Miscellaneous	Abortion	19	1.63
	Other	12	1.03
	Total	31	2.66
Normal	Pregnant/ Recently calved	176	15.16
	Normal cyclic/estrus	55	4.74
	Total	231	19.90
Grand Total		1161	100

repeat breeding (38.33%) and lowest incidence (2.66%) was recorded for miscellaneous etiological factors. In repeat breeder, the highest incidence of 27.48% had been recorded for endometritis followed by cervical pathologies (5.08%), prolonged estrus (4.22%) and fallopian tube defects (1.55%). Similarly, in anestrus animals, the highest incidence of 33.68% was recorded for inactive ovaries and 5.43% incidence was recorded for silent estrus.

The incidence of repeat breeding in India has been reported from 5.5 to 33.33 % in cattle and from 6 to 30 % in buffaloes (Saxena 2004). In present study an incidence of 38.33% was recorded for repeat breeding in cows.

On the other end, higher incidences of anestrus (39.11%) were recorded in cows of Himachal Pradesh. But still very high incidences of 67.68%, 53.15%, 65% and 43.0-67.11% was recorded in West Bengal (Maji and Samanta 2013), Madhya Pradesh (Pandit 2004), Kerala (Kutty and Ramachandran 2003) and Punjab (Singh

et al. 2003), respectively. Almost similar and comparable results of 37.66%, 39.01% and 31.0% were recorded in IVRI, Bareilly (Kumar *et al.* 2008) and Kashmir (Bhattacharyya and Buchoo 2008), respectively. The variable incidence may be because of heterogeneity or multifactorial reasons of anestrus and repeat breeding as well as the effect of locality and season (Ali *et al.* 2009).

The repeat breeding because of anatomical defects includes cervical problems, ovarobursal adhesions and fallopian tube defects (Singh *et al.* 2017) and recorded incidence was 12.80, 0.81 and 0.86, respectively in cattle (Thakur *et al.* 2006). But in our study the recorded incidences were 5.08%, 1.55% for cervical problems, fallopian tube defects, respectively. Oviductal abnormalities were present in 6-15% of adult cows and can reach up to 80% in those with a history of infertility or repeat breeding (Perez-Marin *et al.* 2007). The ovaro-bursal adhesions were being considered as the commonest lesion in cows (Purohit 2008) and the incidence recorded were as low as 0.04%, and as high as 5.5% in cattle (Andrade *et al.* 2005). Gynecological disorders like Anestrus, repeat breeding, cystic ovarian degeneration, uterine and tubal disorders in cattle and buffalo are most common disorders as per the reports from different states (Agarwal *et al.* 2005). Among these reproductive disorders anestrus and repeat breeding syndrome are worldwide problems in dairy animals (Yusuf *et al.* 2010) and has to be treated well in time with latest diagnostic tools to get good and sufficient results.

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