



## Causes and therapeutic management of infertility in abandoned cows of Himachal Pradesh

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Himachal Pradesh is a state with 70% of people associated with agriculture and livestock rearing. Marginal farming system is quite financially unviable as the farmer is willing to maintain a cow until she is lactating, but once the cow becomes permanently dry, whole scenario changes and farmers abandon them (Singh *et al.* 2017).

In western countries, infertile/sterile cows are culled from herd and slaughtered. However, in India where no such provision is made for disposal of these cows, people abandon them when they become uneconomical, which adds to stray cattle population which is escalating manifolds (Kumar 2010). The causes of infertility in abandoned cows are many and can be complex. In order to minimize economic losses, there is need to record the incidence of reproductive problems, their possible etiology with suitable therapeutic measures (Sharma *et al.* 2018).

Therefore, the present study was carried out with the objectives of clinical evaluation of genitalia, identification of possible etiology of reproductive abnormalities in abandoned cows maintained in different *Goshalas* of Himachal Pradesh and to develop strategies for rehabilitation and therapeutic management.

Cows kept in various *Goshalas* in different districts of Himachal Pradesh were selected for study. History of the abandoned animal, if available, was taken from the caretakers of the *Goshalas* which included age, parity, cycle length, feeding status, previous fertility records, date of last calving, post-partum estrus, service dates, natural service or artificial insemination etc. General examination of these cows was done to select cows suffering with reproductive abnormalities and then numbered ear tags were applied to each one for identification. Cows with ailments of reproductive tract were examined thoroughly by rectal examination method and 321 abandoned cows were

diagnosed with 402 reproductive ailments (few of them with multiple disorders). Specific treatments of these cows were done as per diagnosis of reproductive ailment.

Cows suffering from endometritis were treated with single intra-uterine (i/u) administration of 500 mg of Cephapirin benzathine (Metricef, Intervet, India) and i/m administration of Enrofloxacin (Fortivir, Virbac, India) at dose rate of 7.5 mg/kg body weight (BW) once only.

Cows diagnosed with cervical disorders, such as cervical fibrosis and kinked cervix were served with natural service by bull or inseminated with double dose of frozen semen through AI. Similarly, the cows affected with suspected salpingitis were treated with parenteral administration of antibiotics such as Enrofloxacin (Fortivir, Virbac, India) @ 7.5 mg/kg BW.

Cows diagnosed to be true anestrus and small/weak genitalia were administered Toldimphos sodium (T-Phos, Zydus AHL India) @ 5–10 ml i/m and Calcium levulinate (Cal-BD, Vetsfarma Ltd. India) @ 15–20 ml i/m. Tablets CoFeCu (CoFeCu Plus, Indian Herbs India) were also given to each cow @ 2 tablets p.o. daily for 20 days. Vitamin supplementation was provided by injecting Vitamin A, D<sub>3</sub>, E (Vetade, Zydus AHL India) @ 5 ml i/m or Vitamin A, D<sub>3</sub>, E and H (Intavita-H, Intas Pharmaceuticals Ltd. India) @ 5 ml i/m to these cows. Cows diagnosed with silent estrus were treated with i/m administration of Cloprostenol sodium (Clostenol, Zydus AHL India) @ 500 µg i/m.

Cows diagnosed with miscellaneous conditions were treated as per etiology e.g. cows with follicular cyst were treated with i/m administration of Buserelin-acetate (Receptal Vet, Intervet India) @ 20 µg (5 ml) and cows having pyometra were treated with i/m administration of Cloprostenol sodium along with i/m administration of antibiotics (Fortivir, Virbac, India).

In present study, incidence of gynaecological disorders inflicted due to technical errors (cervical disorders, endometritis and ovaro-bursal adhesions) were quite high (50.00%) whereas, success in treating such cows was quite low (12.75%). Comparatively, out of lesser number of cows (38.80%) affected by poor management (true anestrus and silent estrus) more cows (44.45%) could be treated

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Table 1. Incidence and post-treatment follow-up of reproductive problems maintained in various *Goshalas* of Himachal Pradesh

Type of cause	Gynaeco-clinical diagnosis	Incidence (%)	Treated (n)	Followed (n)	Responded (n)	Conceived (%)
Technical errors	Endometritis	27.86	112	83	18	21.69
	Cervical disorders	14.43	58	46	1	2.17
	Affections of fallopian tubes	7.71	31	20	0	0
	Total	50.00	201	149	19	12.75
Poor management	True anestrus/ weak genitalia	33.83	136	83	35	42.17
	Silent estrus	4.97	20	16	9	56.25
	Total	38.80	156	99	44	44.45
Miscellaneous reproductive disorders	Overall	11.20	45	32	1	3.13
		100.00	402	280	64	22.86

successfully (Table 1). Overall recovery rate to various treatments was 22.86%.

Speaking of technical errors, incidence of endometritis was detected in 27.86% abandoned cows in our study (Table 1). The incidence is higher than 18.7 and 19.6% reported in smallholder dairy cows in Kombolcha and Mekele, respectively (Oumer 2003). Our finding is also higher than Mamo (2004) and Ali and Ameen (2014) who reported 13.6 and 18% incidence of endometritis, respectively. Contrarily, higher incidence of 50% has also been reported by Tackacs *et al.* (1990). The variation in the incidence of endometritis compared to the above-mentioned reports can be due to differences in the management system under which the cows were maintained.

Endometritis is a common reproductive disorder in female domestic cows with consequences ranging from no effect on reproductive performance to permanent sterility. It adversely affects their reproductive performance (Amiridis *et al.* 2003). Only 21.69% abandoned cows conceived following treatment with antibiotics (Table 1).

In the current study, 14.43% of the abandoned cows had problems associated with cervix which included cervical fibrosis, cervicitis, non-patent cervix, kinked cervix (Table 1). It is much higher than findings of Feyissa (2000) and Mekibib *et al.* (2013), where it was 5.1 and 2.32% only. Similarly, Andrade *et al.* (2005) found cervical inflammation in 0.6% cases only. This variation could possibly be due to reason that only abandoned infertile cows were studied. An incidence of cervicitis (1.28%) and kinked cervix (0.01%) was also reported in cows examined under field conditions (Raju *et al.* 2007). Cervicitis is known to prevent conception and can occur concurrently with endometritis (Rao *et al.* 1977). Following treatment, one (2.17%) cow conceived following natural service by bull.

In our study, 7.71% abandoned cows were diagnosed with affections of fallopian tubes and adnexa (Table 1). The frequency of oviductal pathologies found in this study is in comparison with 10–15% incidence recorded by Megale (1985). However, Gebrekidan *et al.* (2009) and Simenew *et al.* (2011) reported 1.30 and 1.10% incidence of salpingitis in dairy cows. The higher incidence in abandoned cows could also be due to a result of some popular malpractices like faulty handling of ovary, intra-uterine infusion of irritant drugs in large volume, rupture of cyst

and due to prolonged untreated genital tract infections (Singh *et al.* 2008).

In this study, a significant share of 33.83% abandoned cows was suffering from true anestrus/weak genitalia (Table 1). In agreement to our findings, Gebrekidan *et al.* (2009) also reported 36.60% incidence of anestrus in dairy cows. This can be attributed to malnourishment, as nutritional deficiency and low energy diets are the major causes of inactive ovaries and this is one of the important factors affecting the reproductive performance (Kaur 1994). Reproductive tissue competes with other systems for nutrients because the metabolic hormones that control growth and lactation also influence reproduction, so any deficiency of nutrients will affect the reproductive performance (O'Connor and Zhiguo 2000). Post treatment, 35 out of 83 (42.17%) true anestrus cows and 9 out of 16 (56.25%) silent estrus cows responded positively (Table 1). However, only 1 out of 32 (3.13%) cows treated for other miscellaneous reproductive ailments responded to treatment.

In conclusion, treatment of abandoned cows with respect to specific diagnosis led to conception in fair number of cows. Abandoning of cows by the farmers is increasing day by day which further adds to the stray cattle population. Although nutritional management plays an important role in maintaining the fertility of cows, but proper diagnosis and therapeutic management of the malady in infertile cows is need of the hour to avoid abandoning and make farmers enjoy the benefits of rearing healthy cows.

#### SUMMARY

The present study was carried out with an objective of examining the reproductive status of abandoned cows kept in 18 *goshalas* of Himachal Pradesh. Overall 321 abandoned cows were diagnosed with 402 reproductive ailments (few of them with multifactor etiology). Amongst the genital tract ailments in abandoned cows, a very high incidence, i.e. 50%, of reproductive disorders was associated with injuries/technical errors (endometritis, cervical disorders, affections of fallopian tubes and adnexa) of which only 12.75% were treatable. However, 38.80% incidence of managerial/functional problems (true anestrus and silent estrus) was found and a higher post treatment recovery rate was recorded. This can be attributed to the faulty AI technique, inefficient inseminators or inadequate training on AI. Overall, 22.86%

abandoned cows having various reproductive ailments conceived following different therapeutic regimes.

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