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Studies on Efficacy of Janova, Sepia and GnRH-PG-GnRH Regimen on Induction of Cyclicity in Postpartum Anoestrus Cows

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ABSTRACT
The present study was designed to assess the therapeutic efficacy of Janova, Sepia and GnRH-PG-GnRH regimen on induction of cyclicity in postpartum anoestrus cows. Fourty (n=40) postpartum anoestrus cows presented at Teaching Veterinary Clinical Complex, veterinary hospital, Khandasha, Faizabad and Villages lying adjacent to University area were utilized in this study.The animals were divided in to five groups comprising of Group-G0 as control, Group G-I as mineral mixture, group G-II as Janova, Group G-III as sepia and G-IV as GPG treated group. After starting of the treatment animals were continuously observed for oestrus signs twice daily in morning and evening. The percentage of oestrus induction in group G-I, G-II, G-III & GIV was recorded as 50%, 62.50%, 75%, 87.50%, respectively and conception rate was observed as 50%, 60%, 33.33% and 42.85% after first successful insemination in G-I, G-II, G-III & GIV group, respectively. Haemoglobin, Packed cell volume, Erythrocyte sedimentation rate, Neutrophil, Eosinophil and Monocytes were significantly higher (P>0.05) in normal cyclic cows as compared with postpartum anoestrus cows. A Significantly higher (P>0.05) values of serum Total protein, Calcium, Phosphorus, Glucose, Albumin and Total cholesterol were observed in normal cyclic cows.The findings of present experiment suggested that commercial herbal preparation (Janova), homeopathic medicine (Sepia) and GPG Protocol have effective in the induction of cyclicity in postpartum anoestrus cows. Sepia, a low cost homeopathic medicine can be used as drug of choice for resumption of cyclicity in postpartum anoestrus cows.
Keywords: Anestrous cow, Janova, Sepia, GnRH-PG-GnRH

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INTRODUCTION

Anoestrus or failure of estrum is most common single cause of infertility in dairy cattle that leads to huge economic losses mainly because of prolonged calving interval, reduced calf crop and shorter productive life. In India, the incidence of anoestrus has been reported from 12.37% [20] to 64.81% [14]. A cyclicity in dairy cows due to smooth ovary is one of the important factors determining the length of calving interval. The main causes of true anoestrus include low plane of nutrition, chronic or debilitating disease, senility, seasonal change and heavy milk yield. It has been proven that a certain threshold frequency of LH secretion is necessary to establish ovarian cyclicty after calving, because the occurrence of prolonged period of ovarian quiescence and an ovulation are mainly due to lowered plasma LH level [9]. Factors that suppress LH pulse frequency are energy deficiency, malnutrition, stress factors, endogenous opioid peptides, suckling and lowered insulin concentration [22]. Homeopathy is one of the fastest growing alternative medicines available today. It is used as dynamized microdoses of herbs, minerals and animal products to stimulate the body's innate healing mechanism. Veterinary homeopathy has its strongest modern tradition in Europe, particularly in Germany, France and Great Britain. It is suggested that homeopathic medicines are effective method of treating a wide variety of ailments at a minimal cost, considerable safe and also has no dangerous residue effect as in allopathy. Currently homeopathy

treatment has established its reputation among all categories of human society with increasing popularity [8].

Many hormonal preparations like GnRH, eCG, progestogen alone or in combination have been tried on anoestrus animals to induce oestrus and restore the ovarian cyclicity. prostaglandin ($PGF_2\alpha$) both endogenous and exogenously administered affects ovulation, luteal regression, implantation, parturition, postpartum physiology through myometrial contraction, chemotactic response in enhancing the sensitivity of pituitary for better LH release [34]. PGF2 administration postpartum has been reported to shorten the postpartum interval in beef cows [25, 32] and may influence days of first estrus in dairy cows. Young *et al.,* [35] and [38] by enhancing lochia evacuation. Postpartum period is reduced in cows treated with $PGF_2\alpha$ or induced to secrete $PGF_2\alpha$ due to combination of mechanisms. Uterine involution or follicular development may be hastened which may advance ovarian cyclicity. Interaction between the uterus, the hyothalmic pituitary ovarian axis and $PGF_2\alpha$ in early postpartum estrus expression is through the release of GnRH [40]. $PGF_2\alpha$ can enhance uterine defense by mitigating the immunosuppressive effect of progesterone. $PGF_2\alpha$ is a pro-inflammatory molecule that stimulates the production of cytokines which enhance phagocytosis and lymphocyte function [30].

MATERIALS AND METHODS

The present study was carried out at Department of Veterinary Gynecology and Obstetrics, College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj Faizabad. The study was planned to develop cost effective therapeutic management of postpartum anoestrus in cows. The postpartum anoestrus cases presented at Veterinary Hospital Khandasa Block and the Villages in vicinity of university were selected for the study.

The post partum anoestrus cows which were having small, smooth and inactive ovaries with the absence of graffian follicle or corpus luteum and characterized by absence of estrus were selected for herbal treatments. The selected postpartum anoestrus cows were divided into four (G0, GI, GII, GIII, GIV) group and one normal cyclic cows (GV) group were also included for assessment of normality after treatment of acyclic animals with ethno-veterinary medicines. Each group was comprising of eight (n=8) animals. The animals in G0 grouped as untreated control. The group G1 is treated with only mineral mixture whereas GII, GIII and GIV group was treated with herbal medicine i.e Janova, Homeopathic medicine (Sepia-30) & GPG Protocol, respectively.

All post partum anoestrus cow were treated with fenbendazole @7.5 mg per kg body weight to reduce the worm load in affected animals and animals were supplemented with chelated mineral mixture powder @ 50 gm p.o, once a day for 20 days before start of treatment to provide uniform condition and elimination of parasite and nutritional deficiency of major and micro minerals important for reproduction and health status. The overall estrus induction and conception rate was recorded as 50% & 75% for mineral mixture, 62.5% & 80% for Janova, 75% & 66.66% for Sepia, 87.5% & 57.14% for GPG treatment. The recovery rate was highest in GPG treated group.

Study for Treatment:

The selected fourty (n=40) anestrous cows will be divided into five groups, each comprising of eight (n=8) animals. The treatment will be given as per following schedule and various parameter were assessed.

Group	Treatment
G0	Anoestrus without treatment
G I	Deworming (day 0) + Min. Mix. Supplementation for 10 days (1-10 days), served as control
G II	Deworming (day 0) + Min. Mix. Supplementation for 10 days (1-10 days) + jenova capsule daily for 2 days followed by 3 capsule orally for two days on 11th day
G III	Deworming (day 0) + Min. Mix. Supplementation for 10 days (1-10 days) + sepia 30, 10 drops orally daily for 10 days
G IV	Deworming (day 0) + Min. Mix. Supplementation for 10 days (1-10 days) + GnRH-PG-GnRH regimen
G V	Normal estrus exhibited cow

RESULTS AND DISCUSSION

Blood Biochemical Parameters

A.Total protein (gm/dl): There was significantly higher ($P<0.05$) level of total serum protein in responded animals in comparison to anoestrus control. Virmani *et al.,* [33] found similar result in pretreated & post treated group as 6.52±0.57 and 8.61±0.64, respectively. In contrast to our findings, Mahour [15] found that the level of serum total protein concentration was significantly higher ($P<0.05$) in anoestrus cows (7.29±0.31 gm/dl) as compared to induced estrus cows (6.36±0.48 gm/dl). Bhoraniya *et al.,* [7] found total protein mean values in anoestrus and normal cyclic cow under study were 5.89±0.23 and 6.20±0.20 gm/dl, respectively. According to Pariza *et al.,* [20], mean total serum protein in anoestrus

and control group of cow were 3.4±0.8 and 5.2±0.8 gm/dl, respectively. It was significantly (P<0.05) lower in anoestrus group than that of control group of cows.

B.Calcium (mg/dl): There was significantly higher level (P<0.05) of serum calcium in cyclic & treated animals in comparison to pretreatment value. Virmani *et al.,* [33] found similar results of mean values of serum calcium level in normal cyclic cow and anoestrus cow 7.50±1.21 and 9.27 mg/dl, respectively. In contrast to our finding, Bhoraniya *et al.,* [7] found serum calcium level in anoestrus and normal cyclic group was 9.67±0.23 and 8.01±0.79, respectively. Singh *et al.,* [29] reported lower concentration of serum calcium in cyclic group as compared to anoestrus Hariana cows.

C.Phosphorus (mg/dl):

It was observed that serum phosphorus concentration is significantly higher (P<0.05) in treatment groups in comparison to pretreated cows. Agrawal *et al.,* (2015) found similar results, he reported that normal cyclic animals had significantly (P<0.05) higher phosphorus level as compared to the anoestrus animal. The mean serum phosphorus value in anoestrus animals were lower than that recorded by Virmani *et al* [33] and Bhoraniya *et al.,* [7]. The phosphorus level of cyclic & responded cows were lower than that of Virmani *et al* [33], Bhoraniya *et al* [7] & . The phosphorus level was significantly higher in conceived than non-conceived group Kumar *et al.,* [11].

D. Glucose (mg/dl): It was observed that glucose level is significantly higher (P<0.05) in post treated in comparison to pretreatment group. The mean value of serum glucose is 42.58±6.73 and 73.7±10.69 in anoestrus and normal cyclic cow, respectively. The serum glucose was reported to be an important factor which modulates reproduction and the same at lower level is postulated as the cause for decreased fertility rate as well as for nor cyclicity Yadav *et al.,* [36]. Many workers have supported the view that the concentration of glucose reflects the energy status and reproductive activity of the animals [16, 18]. Mc Clure [16] observed that variations in blood glucose were clearly linked to cyclicity and fertility. The loss of ovarian activity in hypoglycemic animals is due to the effect of hypoglycemic state on the release of gonodotrophins from hypothalamus. Kumar & Saxena [12], Suggested that the reduced concentration of glucose and insulin in blood were associated with nutritional anoestrus. Glucose thus appears to be centrally involved in the release of LH and this presumably reflects its role in modulating GnRH release.

E. Albumin (mg/dl): It was observed that serum albumin level is significantly higher (P<0.05) in treatment group in comparison to pre treatment group. Virmani *et al.,* [32] finding is similar to our finding, she reported slightly elevated serum albumin in cow suffering from postpartum anoestrus compared to control group. It is generally accepted that albumin levels are positively related with productive and reproductive performance [25]. In contrast to our finding, Mahour *et al.,* [15] reported that level of serum albumin was significantly higher (P<0.05) in anoestrus cows (3.25±0.12 gm/dl) as compared to induced estrus cows (2.61±0.18 gm/dl).

F. **Cholesterol (mg/dl):** It was observed that mean values of cholesterol is significantly (P<0.05) higher in treatment group. In contrast to our finding, Virmani *et al.,* [33] found that cholesterol levels decreased as the animal approached towards cyclicity. The utilization of cholesterol for optimum steroid hormone biosynthesis to maintain the cyclicity may be correlated with lower level of cholesterol in cyclic animal [38].According to Ahmad *et al.,* (2004), the mean values of cholesterol in cyclic cow and non-cyclic cows was 199.12±9.38 and 202.96 ±14.84, respectively. He reported that difference between cyclic and non cyclic animals was nonsignificant. Similarly, Zaman *et al.,* [38] reported a non significant difference in level of plasma cholesterol of cyclic and non cyclic animal. In contrast to present findings, Bhoraniya *et al.,* [7] and Virmani *et al.,* [33] suggested that the values of cholesterol is higher in non-cyclic animal to comparison of cyclic animal. Singh *et al.,* [32] observed that high level of cholesterol increased the estrogen level resulting in manifestation of heat, as cholesterol is the precursor of steroid hormones. Kumar and Sharma [14] supported our finding, he found that high incidence of repeat breeding and anoestrus are associated with the deficiencies of cholesterol might be due to inadequate availability of metabolites and metabolic hormones in the central nervous system causing low level of GnRH secretion from the hypothalamus and also the gonadotrophic hormones from the anterior pituitary gland. Kumar *et al.,* [12] recorded high plasma total cholesterol concentration in normal cyclic than the repeat breeder cows. Though there was no significant difference in the levels between conceived and non-conceived groups. Jain and Pandita [10] and Singh and Singh [31] observed significantly higher level of total serum cholesterol at induced estrus. Mahour *et al.,* [15] observed that mean total cholesterol level in the cows during anoestrus before giving treatment was 125.01±9.65 mg/dl. At induced estrus the overall mean total cholesterol level was 118.90±10.2 mg/dl, whereas Ramakrishna [24] observed that cholesterol level was significantly higher in normal cyclic crossbred cows as compared to anoestrus cows.

Hematological parameter :

A. Haemoglobin (gm/dl): The mean values of hemoglobin is significantly higher (P<0.05) in post treated animals. According to Pariza *et al.,* [21], mean value of hemoglobin in anoestrus and control group was

10.2±1.5 and 13.1±2.6, respectively. The hemoglobin concentration is significantly higher in control group comparison to anoestrus group. The haemoglobin concentration is significantly higher in treatment group in comparison to anoestrus group. The lower hemoglobin might be due to anemia caused by gastrointestinal parasites or nutritional deficiency of protein and micro minerals [18]. Though the importance of haemoglobin levels has not been directly implicated in reproductive disorders. A low level of haemoglobin influences tissue oxygenation of the reproductive tract, which in turn could affect the cyclicity Ramakrishna [24].

B. Total leucocytes count : The mean total leucocytes count value is significantly (P<0.05) lower in treatment group in comparison to pre-treatment group. Pariza *et al.,* [21] finding is supported to our finding he reported that significantly higher TLC values in anoestrus groups of cows was than that in the cyclic cows. Leucoytosis occurs as a results of infection in the body. The degree of leukocytosis depends upon several factors including nature of causative agent, severity of infection, resistance of animal and localization of inflammatory response [6] The differences between groups were significant. Ahmad *et al.,* [2] observed no significant difference in TLC value in cyclic and non-cyclic cows.

C. Packed cell volume (%): The mean PCV values is significantly higher (P<0.05) in treated animals as compared to untreated control group. The PCV is index of anemia [23, 5]. Kumar and Sharma [13] and Ahmad *et al.,* [3] reported lower values of PCV in anestrous cows. Patil *et al.,* [23] noted that PCV was higher in cyclic heifers than other heifers. The cyclic estrus cow have higher metabolic rate, which causes increase in production of RBC and this lead to increased values of other hematological parameters.

D.ESR (Erythrocyte Sedimentation Rate): The mean values of ESR in pre and post treated group G_0, G_I, G_{II}, G_{III}, G_{IV} & G_V was observed as 7.05±0.10, 7.10±0.09, 7.21±0.01, 7.18±0.07, 7.10±0.08, 7.81±0.03, & 7.03±0.04, 7.52±0.07, 7.96±0.08, 7.93±0.08, 8.16±0.10 7.81±0.06. In contrast to present findings variation in ESR values due to seasons of the year were also highly significant (P<0.01) with highest values observed during autumn than other seasons. Patil *et al.,* [23] stated that erythrocyte sedimentation rate in new born buffaloes was very low but later on it increased is the age advanced.

DLC (Differential leucocytes count):

A. Neutrophil count (%): There was no significant difference (P<0.05) was observed in before treatment group and after treatment group. Whereas Ahmad *et al.,* [3] reported that there was no significant difference in the neutrophil count in the cyclic and non cyclic animals. Leukocytosis induced as a result of infection promotes the release of neutrophils from the bone marrow through leukocytosis-inducing factor (LIF) of the plasma concentration of LIF is increased in bacterial disease by bacterial products. Hence leukocytosis (Neutrophilia) occurs in such disease [28]. In states of excitement, exercise and strange surrounding there was occurrence of leukocytosis (Neutrophilia), since adrenaline liberated during these states might has mobilized the marginal neutrophils pool cells [27].

B. Lymphocyte count (%): There was no significant difference (P<0.05) observed in pre & post treated group. Similar results were also observed by Ahmad *et al.,* [3]. Function of lymphocytes of its products range from the neutrophilization of pathogens with specific antibodies to the activiation of macrophages and to direct cytotoxic activity. Lymphocytes differentiate in primary lymphoid organs where they commit a lymphocytic lineage, express B or T cell receptors which, are essential for cell survival of further maturation as well as function and are selected according to their capacity of antigen recognition

C. Monocyte (%): There was no significant difference (P<0.05) was recorded in anoestrus and treated animal which is similar to the observation of Ahmad *et al* [2]. Monocytes are a sunset of circulating white blood cells that can further differentiate into a range of tissue macrophages of dendrictic cells [4]. Blood stream monocytes are derived from precursors in the bone marrow and are subdivided into subsets that differ in size, trafficking stimulation, with cytokines and microbial molecules [4] monocytes mediate host antimicrobial defense [29] and are also implicated in many inflammatory disease Woollard of Geissman [36].

D. Basophil count (%): There was no significant difference in (P<0.05) before treatment group of after treatment group.

E .Eosinophil count (%): There was no significant difference (P<0.05) in before treatment and after treatment group. In a study Ahmad *et al.,* [2] reported significantly (P<0.05) higher values of eosinophil in non cyclic cow than normal cyclic cows, while Ahmad *et al.,* [3] observed that there was no significant difference in eosinophil count among the cyclic and non-cyclic cows.

Table 1; Effect of mineral mixture, commercial herbal drug (Janova), homeopathic medicine (sepia-30) and GPG protocol on biochemical profile (mean±SE) in postpartum anoestrus cows

Parameter	Status	Treatments					
		G0	G1	G2	G3	G4	G5
Total Protein	Before	6.72±0.12^{Y}	6.91±0.10^{A,Y}	6.98±0.08^{A,}	6.87±0.06^{A,Y}	6.82±0.07^{A,Y}	8.53±0.02^{X}
	After	6.75±0.14^{Y,a}	7.93±0.07^{B,ab}	8.46±0.06^{B,bc}	8.48±0.08^{B,bcd}	8.65±.04^{B,cde}	8.54±0.04^{X}
Calcium	Before	7.62±0.10^{Y}	7.71±0.06^{Y}	7.66±0.06^{Y}	7.69±0.08^{Y}	7.74±0.06^{Y}	9.20±0.04^{X}
	After	7.65±0.10^{a,Y}	8.95±0.07^{B,ab}	9.31±0.06^{B,bc}	9.29±0.06^{B,bcd}	9.49±0.05^{B,ced}	9.21±0.03^{X}
Phosphorus	Before	3.81±0.05^{Y}	3.85±0.03^{Y}	3.84±0.03^{Y}	3.84±0.04^{Y}	3.87±0.03^{Y}	4.60±0.02^{X}
	After	3.83±0.05^{aY}	4.47±0.03^{B,ab}	4.65±0.03^{B,bc}	4.65±0.03^{B,bcd}	4.74±0.02^{B,cde}	4.61±0.01^{X}
Glucose	Before	50.50±0.58^{Y}	51.30±0.72^{Y}	51.52±0.85^{Y}	51.73±0.70^{Y}	51.81±2.16	57.05±0.43^{X}
	After	50.95±0.67$^{a\ Y}$	55.13±0.69^{B,ab}	58.05±0.99^{B,bc}	58.48±1.05^{B,bcd}	58.86±0.95^{B,bcde}	57.33±0.79^{X}
Albumin	Before	2.71±0.04^{Y}	2.72±0.06^{Y}	2.81±0.07	2.89±0.06	2.91±0.65	3.42±0.13^{X}
	After	2.76±0.04^{a}	3.26±0.06^{B,ab}	3.51±0.09^{B,bc}	3.62±0.05^{B,bcd}	3.69±0.03^{B,cde}	3.45±0.04^{X}
Cholesterol	Before	80.40±0.44^{Y}	81.12±0.58^{Y}	81.99±0.73	81.36±0.60^{Y}	81.91±0.70	129.7±0.48^{X}
	After	80.58±0.66^{a}	124±0.55^{B,ab}	131.4±1.07^{B,bc}	132.0±0.98^{B,cd}	133.4±0.65^{B,cde}	129.8±0.51^{X}

Mean bearing different superscript in the column (A, B) and in a row (a, b, c, d, and e) significantly differed repeatedly for each attributes

Table 2: Effect of mineral mixture, commercial herbal drug (Janova), Homeopathic medicine (sepia-30) and GPG Protocol on hematological profile (mean±SE) of postpartum anoestrus cows

Parameter	Status	Treatment					
		G0	G1	G2	G3	G4	G5
Hemoglobin	Before	8.90±0.05	9.03±0.08^{Y}	9.13±0.07	9.09±0.06^{Y}	9.11±0.07^{Y}	11.36±0.36^{X}
	After	8.91±0.06$^{a\ Y}$	9.99±0.11^{B,ab}	11.15±0.23^{B,bc}	11.38±0.29^{B,bcd}	11.64±0.29^{B,cde}	11.43±0.23^{X}
TLC	Before	9.36±0.04^{Y}	9.34±0.05^{Y}	9.38±0.06^{Y}	9.36±0.06^{Y}	9.40±0.57^{Y}	7.36±0.09^{X}
	After	9.35±0.05$^{a\ Y}$	7.5±0.07^{B,ab}	7.29±0.10^{B,bc}	7.30±0.05^{B,bcd}	7.18±0.05^{B,bcde}	7.33±0.05^{X}
PCV	Before	27.35±0.49^{Y}	28.77±0.24	27.11±0.46^{Y}	27.87±0.33^{Y}	28.62±0.32	31.26±0.34^{X}
	After	27.38±0.40^{a}	29.50±0.35^{B,ab}	32.27±0.31^{B,bc}	32.76±0.50^{B,cd}	33.84±0.55^{B,cde}	31.56±0.41^{X}
ESR	Before	7.05±0.10	7.10±0.09^{Y}	7.21±0.01^{Y}	7.18±0.07^{Y}	7.10±0.08^{Y}	7.81±0.03^{X}
	After	7.03±0.04$^{a\ Y}$	7.52±0.07^{B,ab}	7.96±0.08^{B,bc}	7.93±0.08^{B,bcd}	8.16±0.10^{B,cde}	7.82±0.06^{B,X}

Mean bearing different superscript in the column (A, B) and in a row (a, b, c, d, and e) significantly differed repeatedly for each attributes

Table 3, Effect of mineral mixture, commercial herbal drug (Janova), Homeopathic medicine (sepia-30) and GPG Protocol on differential leukocyte count (mean±SE) of postpartum anoestrus cows

Parameter	Status	Treatment					
		G0	G1	G2	G3	G4	G5
Neutrophil	Before	25.88±0.35	26.38±0.46	26.50±0.42	26.63±0.46	26.38±0.38	27.88±0.35^{X}
	After	25.50±0.19^{a}	28.50±0.42^{b}	28.63±0.42^{bc}	28.75±0.45^{bcd}	28.38±0.38^{bcde}	27.38±0.38^{X}
Lymphocyte	Before	67.00±0.50	66.38±0.42	66.63±0.60	65.88±0.61	65.88±0.44	65.50±0.19^{X}
	After	67.13±0.44^{a}	66.75±0.59^{ab}	64.63±0.60^{B,abc}	63.88±0.61^{B,bcd}	63.88±0.44^{B,cde}	65.25±0.25^{X}
Monocyte	Before	3.25±0.25	3.25±0.37	3.25±0.37	3.63±0.26	3.63±0.18	3.70±0.25^{X}
	After	3.38±0.26^{a}	4.13±0.30^{ab}	4.13±0.30^{abc}	4.50±0.19^{B,abde}	4.63±0.18^{B,bcde}	4.13±0.23^{X}
Basophile	Before	0.38±0.18	0.50±0.19	0.38±0.18	0.50±0.19	0.38±0.18	0.50±0.19^{X}
	After	0.50±0.18	0.63±0.18	0.38±0.18	0.50±0.19	0.75±0.16	0.63±0.18
Eosinophil	Before	3.38±0.18	3.50±0.19	3.50±0.19	3.50±0.19	3.38±0.18	3.00±0.28^{X}
	After	3.38±0.18^{a}	2.25±0.16$^{B.b}$	2.50±0.19^{B,abc}	2.38±0.18^{B,abcd}	1.88±0.13^{B,bced}	2.63±0.26^{x}

Mean bearing different superscript in the column (A, B) and in a row (a, b, c, d, and e) significantly differed repeatedly for each attributes

CONCLUSION

Biochemical and hematological profile was differed significantly between cyclic and postpartum anoestrus cows, so that these parameters helpful in the diagnosis of postpartum anoestrus cows. Overall estrus induction and conception rate was recorded as 50.00 % & 75.00 % in Mineral mixture, 62.50% & 80% in Janova, 75 % & 66.66 % in Sepia, 87.50 & 57% GPG treated group. Based on present finding it is concluded that GPG protocol and homeopathic drug (Sepia-30), have effective to estrus induction in

postpartum anoestrus cows and GPG protocol is more effective to estrus induction in postpartum anoestrus cows.

The commercial herbal preparation Janova and homeopathic medicine (Sepia) will reduce the cost of treatment.

Based on above, it can be stated that anoestrus is most commonly occurring reproductive problem of cattle. It is functional disorder of reproductive cycle.

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