



Effect of Estrous Synchronization Protocols on Estrous induction Response and Conception rate in anoestrous Gir cows

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ABSTRACT

The present study was planned to assess the effect of estrous synchronization protocols for the management of anoestrous condition in Gir cows. The study was carried out on 24 true anoestrous and 12 normal cyclic cows. Twelve anoestrous cows each were treated with Ovsynch and Cosynch protocol considering the day of GnRH injection as day 0. The cows in oestrus were inseminated with good quality frozen-thawed semen by a single technician at least for three cycles post-treatment if not settled. Pregnancy diagnosis was performed at 60 days post insemination in non-return cases. Conception rates at induced estrous in ovsynch and cosynch protocol were 58.33 and 25%, respectively. The corresponding overall conception rates of 3 cycles post-treatment were 75 and 66.67%, respectively. In control group, first service and overall conception rates were 33.33 and 41.67%, respectively. The results were best with Ovsynch followed by cosynch protocol. In conclusion, Ovsynch and cosynch protocols may serve as an excellent tool for induction of estrous and improvement of pregnancy rate in anoestrous Gir cows.

Key Words: Gir cows, Anoestrous, Ovsynch, Cosynch, Conception rate.

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INTRODUCTION

In a dairy farm, economic success primarily depends on production of calf crop at a regular interval and any deviation from this results economic loss owing to prolonged dry period, reduced number of calf crop and lactation during the life span of animal. Reproductive efficacy is considered as a key factor in dairy farm management. Improved reproductive management in dairy cattle increases milk productivity as well as reproductive capabilities of cows and young stocks [6]. Though the Gir cattle are recognised as one of the hardiest breeds among the high yielders in the world [9], they have poor reproductive performance (extended post-pubertal and postpartum anoestrus periods) as compared to exotic temperate breeds reared under similar management including the surrounding environments. The reproductive performance of high yielding cattle with high genetic merit declines in many dairy industries because of the negative association between the two traits. One of the major constraints of profitable dairy farming is low conception rate in dairy cows [20]. Anoestrous is the alarming condition consisted majority of infertility problems in zebu cattle. In such situation, hormonal interventions in dairy cattle have been gaining more importance to improve heat detection and insemination as well as pregnancy rates under a variety of production systems.

Reproductive efficacy could be improved in infertile cattle by hormonal therapies only with better nutrition [3, 14]. Various protocols have been developed using a combination of different hormones to induce and synchronize estrus for better pregnancy in anoestrous dairy bovines. These therapies induce cyclicity in acyclic animals and help to achieve ideal inter-calving interval of 12-13 months through a lesser number of services per conception [13]. Estrous synchronization protocol has been reported to considerably narrow down the ovulation time to a range of 24 hours to achieve the goal of maximum conception rate with fixed time artificial insemination and eliminates the need for estrous detection [8]. Ovsynch and Cosynch protocols have been standardized well to control the estrous cycle and improve reproductive efficiency in dairy cattle [11]. The present study was designed to evaluate the comparative

efficacy of two estrous induction and synchronization protocols (Ovsynch and Cosynch) in postpartum anoestrus Gir cows.

MATERIALS AND METHODS

Animals, ration and experimental design:

The present study was conducted on 36 Gir cows selected from the herd maintained at the Cattle Breeding Farm, JAU, Junagadh. Of these, 24 cows had the history of anoestrus, whereas other 12 normal cyclic cows served as control. The cows had a moderate body condition with body weight ranging from 350 to 450 kg and were of 2 to 6 parity with the average milk production of 2500 to 3000 litres per lactation. All animals were fed green fodder, hay, compounded concentrate and mineral mixture as per the standard feeding schedule on the farm. Throughout the study period, animals were maintained under similar feeding and other farm practices under loose housing system of management. All the animals were in healthy condition and kept under strict control measures for internal and external parasitism, as they undergo a periodical deworming and prophylactic vaccination against the endemic diseases. The cows were screened gynaeco-clinically for their reproductive status. Detailed history and rectal palpation findings were recorded. Anoestrus cows were confirmed by palpating smooth inactive ovaries per rectum twice 10 days apart. They were randomly subjected to following two estrous synchronization protocols (*viz.*, Ovsynch and Cosynch, $n=12$ each) with fixed time artificial insemination.

Treatment Protocols:

Twelve true anoestrus cows (Group-I) under Ovsynch protocol were administered intramuscularly with injection of GnRH, 5ml (Buserelin acetate 0.0042mg/ml equivalent to 0.004mg Buserelin/ml 'Receptal', Intervet, Germany) on day 0, followed by an injection 500 μ g (2ml) PGF₂ α (Pergola, Virbac) on day 7, and a second GnRH injection of 5ml on day 9. Fixed time AI was performed 22hrs after second GnRH injection.

Another twelve animals (Cosynch group, Group- II) were treated with the single intramuscular injection of 5 ml, GnRH, followed by an injection of 500 μ g (2 ml) of PGF₂ α on day 7 and fixed time AI was performed 48 hours after PG injection together with single intramuscular injection of 5 ml of GnRH.

The third group (Group-III) of 12 normal cyclic cows that expressed spontaneous estrus within 90 days postpartum and inseminated served as normal cyclic control group. Cows in spontaneous or induced estrus were inseminated using good quality frozen-thawed semen by a single technician. Animals detected in estrus subsequent to FTAI were re-inseminated up to two cycles and in non-return cases pregnancy was confirmed per rectum 60 days of last AI.

Statistical analysis:

The data were compiled, expressed as a percent for better interpretation and analyzed statistically. The variation between groups in estrous induction response and conception rate was compared by chi-square test and considered as significant if ' p ' ≤ 0.05 .

RESULTS AND DISCUSSIONS

Anoestrus is the commonest single cause of infertility in cattle [17]. Results pertaining to estrous induction response and fertility in anoestrus Gir cows have been presented in Table-1.

Table-1: Oestrus induction response and fertility in true anoestrus Gir cows treated with Ovsynch, Cosynch and Untreated control groups.

Reproductive Status	Treatment Group	No. of Cows	Estrous Induction Response (%)	Conception rate (%)			
				First Service	Second Service	Third Service	Overall
Anoestrus Gir Cows	Ovsynch (Group-I)	12	100 (12/12)	7/12 (58.33)	2/5 (40)	-	9/12 (75)
	Cosynch (Group- II)	12	100 (12/12)	3/12 (25)	3/9 (33.33)	2/6 (33.33)	8/12 (66.67)
Normal Cyclic Gir Cows	Untreated Control (Group- III)	12	-	4/12 (33.33)	-	1/8 (12.5)	5/12 (41.67)
Chi-square value				3.039	0.8	0.347	3.039
p-value		36	-	0.219	0.06	0.884	0.219

All the animals came to heat after estrous induction using Ovsynch and Cosynch treatment in anoestrus Gir cows. The conception rates obtained at induced estrus in cows under these two protocols were 58.33 and 25%, respectively, with corresponding overall pregnancy rates of three cycles as 75 and 66.67%. In the untreated normal cyclic control group ($n=12$), the conception rates at the first service and overall of

three cycles were 33.33 and 41.67%, respectively. The overall conception rate was higher in Group- I and II as compared to the normal cyclic group- III. But, the results were statistically non- significant. The response of anoestrous animal was at par the normal cycling animals indicating that the treatment has a significant effect on conception.

The findings with the Ovsynch protocol is in line with Dhama *et al.* [5] as 50.00% and 40.00%, first and second service conception rate in anoestrous crossbred cows, respectively, whereas, the overall conception rate was 80.00%. Lower first service conception rates of 30.00% [15] and 29.41% [4] with Ovsynch protocol are also documented by other researchers. Nak *et al.* [13] reported overall conception rate of 42.18% in non-cycling cows and 44.07% for heifers. Relatively lower conception rates of 46.66 to 55.55% were noted in other breeds of cows elsewhere [19, 16, 7]. However, conception rates of 61.00 to 90.00% were also noted in cows by Ansari *et al.* [2] and Muneer *et al.* [12]. The possible reason for variation could be the reproductive status or stage of estrous cycle at the beginning of the protocol, nutritional, managerial, lactation, drug source, age and breed and variations in geographical locations.

The conception rate was 33.33% at induced estrus and 75.00% in the second cycle, with an overall conception rate of 83.33% for two cycles obtained with Cosynch protocol by Ramakrishnan *et al.* [18]. The conception rate obtained at first service of this study was similar to that reported previously (28-38%) in other breeds of anoestrous cows [1, 10].

CONCLUSION

An anoestrous condition in Gir cows could be augmented by different hormonal protocols *viz.* Ovsynch and Cosynch protocols. Hence, it can be used by the practising veterinarians in anoestrous cows to improve their reproductive efficiency and thereby the farmers economy.

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