



## Effect of progesterone and oxytocin on conception rate in repeat breeding Cattle

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ARTICLE INFO	ABSTRACT
<b>Original Research article</b> Received on May 01, 2017 Accepted on May 30, 2017  <b>Article Author</b> Dinesh Mahto <b>Corresponding Author Email</b> <a href="mailto:drdineshgy@gmail.com">drdineshgy@gmail.com</a>	A total of 50 cross bred repeat breeder cattle were selected and grouped into 4 treatment and one control group which belonging to organized farms around, K. V. K. Gandhar, Jehanabad. Hydroxyprogesterone caproate (500 mg) was administered I.M. on day 4 post A. I. in group I, In group II, 500mg progesterone was administered I M on day 4 and again on day 10. Evatocin (40 I.U.) was administered I.M. 5 minutes before A.I. to animals belonging to group III. The same drug was used through Intra vulvo-submucosal route (15 I.U.) to animals of group IV. Group V animals received no treatment and served as control. Pregnancy diagnosis was done by rectal palpation D 45-60 after artificial insemination. In group I, the conception rate was found to be 60% as against 20 % in the control (Non-significant), Gr II, the conception rate improved from 20% in control animals to 70% in treated animals (Significant) and Gr III, the C.R. 60% than control(20%) where as Gr IV, C.R. 40% . The difference in conception rate of treatment and control group animals was non-significant.
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Repeat breeding is the most common reproductive disorder in cattle both in organized farm as well as in field condition. Still, fertilization failure and embryonic mortality are the two major factors affecting the fertility of females (Roberts, 1971). Higher embryonic mortality has further been reported to be a major cause of repeat breeding (Awasthi *et al.*, 2002).

### MATERIALS AND METHODS

The present study was conducted on 50 cross bred repeat breeder cattle belonging to organized farms around, K.V.K., Jehanabad from January, 2013 to December, 2013. The animals were in the age group of 3 to 6 years, 2<sup>nd</sup> to 3<sup>rd</sup> parity and apparently normal, healthy and free from obvious genital diseases. The animals under all the treatment and control were examined for pregnancy. The between the periods of 45-60 days, post insemination by rectal palpation.

### RESULTS AND DISCUSSION

During the present study, administration of progesterone on day 4 post insemination in repeat breeding cattle (Gr I) resulting in a conception rate of 60 % which was higher than the conception rate in control animals (20%).

Progesterone administration on day 4 and again on days 10 after artificial insemination (Gr II) further improved the conception rate significantly from 20% in control to 70% in treatment animals. Similar results were recorded by earlier workers like (Singh *et al.*, 2002 and Abhilash, 2006) on day 5 of estrous cycle following artificial insemination increased conception rate. According to (Awasthi *et al.*, 2002) between days 6 to 8 post artificial insemination, conception rate significantly (70%) as compared to control (20%) repeat breeding cows. Kishore *et al.* (2005) on days 3 post insemination, conception rate (46.6%) and (Awagan *et al.*, 2000) conception rate (33.3%) on days 2 post insemination in repeat breeding cows. Normally circulatory progesterone profile following insemination or mating are essential for fertility and subsequent embryonic development. Plasma or milk progesterone concentration rise during the first few days of pregnancy, identical to the early luteal phase of the non-pregnant animals. Madan (1988) suggested that deficiency of progesterone following artificial insemination or natural mating is associated with early embryonic mortality in buffaloes. Major embryonic losses occur either at initiation of blastocyst formation *i.e.* day 5-6 post mating in cattle (Maurer and Chenault, 1983).

**Table 1. Treatment schedule repeat breeding animals**

Groups	Drugs	Dose and Routes	Treatment	
			Pre A. I.	Post A. I.
I (n=10)	Duraprogen	500mg,(2ml), I.M., Single	--	4 days
II (n=10)	Duraprogen	500mg,(2ml), I.M., Single	---	10 days
III (n=10)	Evatocin	40I.U.(8ml), I.M., Single	5 minutes	---
IV (n=10)	Evatocin	15I.U(3ml), I.M., Single	5 minutes	----
V (n=10)	Control	No treatment	Only A.I.	Only A.I.

**Table 2. Percentage of conception in repeat breeder animals under different treatment**

Groups	No of animals treated	No of animals conceived	C.R.(%)	N.D. Values
I (n=10)	10	6	60	1.825 <sup>NS</sup>
II (n=10)	10	7	70	2.247*
III (n=10)	10	6	60	1.825 <sup>NS</sup>
IV (n=10)	10	4	40	
V (n=10)	10	2	20	0.912 <sup>NS</sup>

Developing embryo, in turn secretes trophoblastic protein which prevent regression of corpus luteum (Flint *et al.* 1988). Thus progesterone supplementation should be of great value in improving fertility, particularly in case where early embryonic mortality is likely due to insufficiency of corpus luteum as luteal inadequacy was associated with sub-fertility in cows and buffaloes (Madan, 1988 and Shelton *et al.* 1990). Progesterone treatment is known to alter the uterine environment by stimulating production of series of proteins (Garrett, *et al* 1988; Thatcher *et al.* 1994) and resulting improved embryonic development & also modifies the genital tract motility and movement of fertilized ovum (Roberts, 1989). The could be helpful in preventing the embryonic mortality occurring around the time embryo enter the uterus. Additionally, progesterone treatment between day 1-4 post insemination was found to be associated with better embryo quality at day 11-13 (Ashworth *et al.*,1989), which secrete more amount of antiluteolytic interferon (Mann *et al.* , 1989) . Higher progesterone levels during days 3 to 6 following

insemination in ewes were associated with better embryonic quality and growth at day 11 to 13 (Wilmot *et al.*, 1986; Asworth *et al.*, 1989) and higher production of antiluteolytic factor interferon at the time of maternal recognition of pregnancy in ewes and cattle (Singh, 1994; Mann *et al.*, 1998). Thus administration of exogenous progesterone on days 4 or on days 10 of the cycle in repeat breeding animals might have improved early pregnancy levels of plasma progesterone leading to be amelioration of the problem of repeat breeding.

### Oxytocin Administration and Conception Rate

The conception rate in the repeat breeding animals where 40 I.U. of oxytocin was given I.M. 5 minutes before artificial insemination (Gr III) was 60% as compared to the control (20%). The differences in the conception rate between the control group and when 40 I.U. of oxytocin was given I. M. was not significant. This finding agreement with the finding of Singh and Gangwar (1976) who administrated different doses of

oxytocin to repeat breeder buffaloes and reported that the conception rates were higher (13.6% more) than that of control. Present finding is also in consonance with the result of (Singh *et al.* 1986) who found improvement in conception rate by 17% over control when 30 I. U. of oxytocin was administered 5 minutes before artificial insemination to repeat breeding cattle. Animals in Gr IV were treated with 15 I.U. of oxytocin through intra vulvo-submucosal route 5 minutes before artificial insemination. The conception rate recorded was 40%. Though the conception obtained in this type appears to be have been done in cattle where oxytocin was found from the available literature. However the present finding tailed with that of Singh and Gangwar (1976) who tried 15 I.U. of oxytocin I.M. 5 minutes before artificial insemination as compared to control. During the present experiment low doses of oxytocin (15 I.U.) was tried through intra vulvo-submucosal route keeping in mind the observed of above workers. Here the conception rate in repeat breeding cattle was recorded to be lower (40%) of oxytocin was used through I.M. route. Although no parallel study/report is available to compare the present finding. The experiment of Harris (1947) and Vandemark and Hays (1954) had show that various stimuli of natural mating or artificial insemination resulted in the release of oxytocin which in turn brought about increase in the tone and motility of above uterus. Gorohov (1964) reported that uterine concentration in cows become more intense and rapid after the injection of oxytocin. This helped the transport of spermatozoa from cervix to the oviducts. The animals in heat are nervous and excited and are put to stress while artificial insemination is done. This leads to liberation of epinephrine i.e. fright hormone. In cows, epinephrine causes a relaxation of the oestrogenized uterine muscle thus affecting sperm transport and fertilization rate. Ruckebuch and Bayard (1975) recorded the effect of oxytocin and catecholamine on the motility of oviduct and uterus of cows during oestrus cycle and observed that oxytocin increased the frequency and amplitude of the phase at oestrus without any change in their origin while the effect of adrenaline on the oviduct was inhibitory. Hay *et al* (1958) observed that a deficiency in the release of oxytocin occurred in cows, which affected the conception rate. They further observed that the conception rate could be improved by administration off oxytocin at the time

of breeding. The present study, the exogenous oxytocin administered five minutes before insemination is thought to have neutralized the epinephrine which was released due to nervousness and thus improved the conception rate.

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