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The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2019; 8(12): 443-445

www.thepharmajournal.com
Received: 14-10-2019
Accepted: 18-11-2019

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Hormonal intervention for improvement of fertility in repeat breeder buffaloes

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Abstract
The present investigation "Hormonal intervention for improvement of fertility in repeat breeder buffaloes" was undertaken at Veterinary Polyclinic, Guntur and buffaloes presented to Veterinary Hospitals in and around Guntur District of Andhra Pradesh. The study comprised 32 repeat breeding buffaloes with a history of failure to conceive even after three consecutive artificial inseminations (AI) with good quality frozen semen from a fertile sire. GnRH (Group 1 – 10µg of GnRH 8 hours before AI at observed estrus and Group 2 – 10µg of GnRH 8 hours before AI at observed estrus and 13th day of post insemination), whereas, hCG (Group 3 – 1500 IU of hCG 8 hours before AI at observed estrus and Group 4 – 1500 IU of hCG 8 hours before AI at observed estrus and 13th day of post insemination) protocols for enhancement of fertility studied in 32 repeat breeding buffaloes in comparison with normal cyclical buffaloes as untreated control (Group 5). The conception rates of repeat breeding Graded Murrah buffaloes in Group 1, 2, 3, 4 and control group (Group 5) were recorded to be 25.00, 50.00, 62.50, 75.00 and 42.85 per cent, respectively. In, conclusion hCG treatment groups revealed higher per cent of conception rates when compared with that of GnRH treatment groups.

Keywords: Hormonal intervention, improvement, breeder buffaloes

Introduction
The animal that has failed to conceive even after three or four successful services with fertile bull or artificial inseminations are often termed as repeat breeders. Repeat breeding is one of the major problems in dairy farm management especially in buffaloes which have low reproductive efficiency (Butani *et al*., 2016) [1]. The percentage of incidence of repeat breeding in buffaloes was reported to range between 15-32 with a high of 57.14 per cent (Khasatiya *et al*., 1998 and Butani *et al*., 2016) [2, 1]. Reproduction is primarily governed by gonadotrophic releasing hormone (GnRH) and gonadotrophic hormones (FSH & LH) secreted by hypothalamus and anterior pituitary, respectively and further, by ovarian hormones estrogen and progesterone secreted by graffian follicles and corpus luteum of ovaries structures, respectively. Significant deficient in secretion or stimulation by these hormones culminates to repeat breeding in the form of delayed ovulation, failure of ovulation and early embryonic death (Singh *et al*., 2003 and Butani *et al*., 2016) [3, 1]. Perusal of literature revealed that no systematic studies were carried out on repeat breeding syndrome and the use of GnRH and hCG during mid-diestrum of estrous cycle with regards to conception. The present study recorded conception rate of buffaloes suffers from repeat breeding syndrome.

Materials and Methods
The present investigation was undertaken at Veterinary Polyclinic, Guntur and buffaloes presented to Veterinary Hospitals in and around Guntur District of Andhra Pradesh. The study comprised 32 repeat breeding buffaloes with a history of failure to conceive even after three consecutive artificial inseminations (AI) with good quality frozen semen from a fertile sire. The experiment was carried out for a period of 6 months from July 2018 to December 2018. All the 32 repeat breeder buffaloes were subjected to detailed examination of the complete genital system, by rectal palpation. Thorough examination of the cervix, uterine body, uterine horns and ovaries was performed to detect palpable abnormalities in the genital tract. A total of 32 buffaloes were selected and divided randomly into four equal groups (each group consisting of 8 buffaloes). In the present study animals of four groups were subjected to different methods of hormonal protocols and the groups are designed as follows. GnRH (Group 1 – 10µg of GnRH 8 hours before AI at observed estrus and Group 2 – 10µg of GnRH 8 hours before AI at observed estrus and 13th day of post insemination), whereas, hCG (Group 3 –

1500 IU of hCG 8 hours before AI at observed estrus and Group 4 – 1500 IU of hCG 8 hours before AI at observed estrus and 13th day of post insemination) protocols for enhancement of fertility studied in 32 repeat breeding buffaloes in comparison with normal cyclical buffaloes as untreated control (Group 5). All the recorded data were analyzed statistically as per Snedecor and Cochran (1994) [4].

Results and Discussion

In the present study a conception rate of 25.00 per cent was observed in Group 1 repeat breeder buffaloes which were treated with 10 µg of GnRH (Buserelin acetate) intramuscularly on the day of observed estrus, and artificial insemination done after 8 hours of administration of GnRH (Table.1). The findings of the present study were in consonance with the earlier studies (Selvaraj and Harendra Kumar, 2001) [5]. Tanabe *et al*. (1994) [6] did not find any improvement in conception rate after treatment with GnRH. In the present study less conception rate in Group 1 when compared to control group buffaloes might be due to insufficient dose of gonadotrophic hormone or variations in climate, and nutritional status and management conditions as opined by Kishore Kumar (2010) [7].

In the present study the conception rate of 50.00 per cent was recorded in Group 2 repeat breeder buffaloes which were treated with 10 µg of GnRH analogue (Buserelin acetate) intramuscularly on the day of observed estrus, and artificial insemination done after 8 hours of administration of GnRH and a second dose (10 µg) of GnRH analogue (Buserelin acetate) was administered on13th day after estrus (Table.1). The findings of the present study were in agreement with the earlier studies by Lopez-Gaitus *et al*. (2006) [8], who observed improved conception rate. Increased conception rate in Group 2 in the present study when compared to control group buffaloes might be due to the effect of GnRH administration at 13 days post-insemination which boosted the function of the existing CL which increased plasma progesterone as opined by Robertson *et al*. (1974).

In the present study the conception rate of 62.50 per cent was recorded in Group 3 repeat breeder buffaloes which were treated with 1500 IU of hCG intramuscularly on the day of observed estrus, and artificial insemination done after 8 hours of administration of hCG (Table.1). The present observations were in agreement with the earlier studies of Selvaraju *et al*. (2004) [10] and Carvalho *et al*. (2007) [11], who recorded improved conception rates after administration of hCG during estrus in repeat breeder buffaloes. Effect of hCG administration at estrus coincident with the presence of the dominant follicle which might have stimulated the CL function.

In the present study the conception rate of 75.00 per cent was observed in Group 4 repeat breeder buffaloes which were treated with 1500 IU of hCG intramuscularly on the day of observed estrus, and artificial insemination done after 8 hours of administration of hCG and second dose (1500 IU) of hCG was given at 13th day after estrus (Table.1). The observation of the present study were in agreement with the earlier studies of Schmitt *et al*. (1996) and Khan *et al*. (2007) [12, 13] who recorded improved conception rates after administration of hCG during 13th of estrous cycle in repeat breeder buffaloes. hCG treatment on day 13 post-insemination which suggested that the LH-like activity of hCG might have strength the luteotrophic stimulation to the existing corpus luteum.

The present study revealed that the conception rates in Group 1, Group 2, Group 3 and Group 4 and Group 5 (control) were 25.00, 50.00, 62.50, 75.00 and 42.85 per cent respectively. The hCG treatment (Group 4) was more effective in overcome the repeat breeding problem in buffaloes when compared with the GnRH treatment. It was further, observed that hCG groups achieved higher (62.50 and 75.00%) conception rates when compared with that of GnRH treatment groups (25.00 and 50.00%) and control group (42.85%).

Table 1: Conception rate of repeat breeder buffaloes

Groups	No. of animals	No. of animal inseminated	No. of animal conceived	Percentage conception rate
Group-1	8	8	2	25.00
Group-2	8	8	4	50.00
Group-3	8	8	5	62.50
Group-4	8	8	6	75.00
Group-5	8	7	3	42.85

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