IMPROVEMENT IN CONCEPTION RATE BY GnRH OR hCG ADMINISTRATION ON DAY 5 POST-AI IN NON-INFECTIOUS REPEAT BREEDER COWS

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ABSTRACT

Thirty-six non-infectious repeat breeder cows were selected on the basis of typical fern pattern, negative white side test, normal pH of cervical mucus and <4% polymorphonuclear (PMN) cell count in endometrial content. Selected animals were randomly distributed in three groups containing twelve animals each. Group-I and Group-II were treated with inj. GnRH @ 10 mcg and inj. hCG @ 2000 IU by intramuscular route, respectively on day 5 post-AI, whereas group-III served as controls. Conception rates in group I, II and III was recorded as 58.3, 66.7 and 25.0%, respectively. Thus, hCG treatment on day 5 post-AI improved conception rate in non-infectious repeat breeder cows.

Key words: Conception rate, GnRH, hCG, Non-infectious, Repeat breeder

About 32-35% cases of repeat breeding in dairy animals are due to non-infectious causes and out of these early embryonic mortality is one of the most important cause (Diskin *et al*., 2008). Inadequate functioning of corpus luteum (CL) is responsible for early embryonic mortality in cattle (Kimura *et al*., 1987). Delayed leutinization may lead to inadequate release of progesterone during early embryonic period, thereby reducing the chances for embryonic survival. Several measures were adapted to correct luteal dysfunction including use of GnRH (Lewis *et al*., 1990) or hCG (Santos *et al.,* 2001) after insemination which increases progesterone secretion and renders high conception rate. Considering the post-fertilization reproductive events and endocrine changes, it is proposed to attempt GnRH and hCG therapies in non-infectious repeat breeder cows for improvement of conception rate.

Thorough clinical investigations were conducted to select the specific cases of repeat breeding due to luteal insufficiency. The cases were evaluated during estrus stage by per-rectal palpation as well as through laboratory investigations to rule out other etiological factors causing repeat breeding like improper timing of insemination or embryonic mortality due to uterine infection. The cervico-vaginal mucus (CVM) was collected in a sterilized petridish on the day of estrus simultaneously with per-rectal palpation. Fern patterns in cervico-vaginal mucus smear were evaluated under low power (10 X) and were classified as Typical type (fern pattern with primary, secondary and tertiary branches), Atypical type (fern pattern with primary and secondary branches) and Nil type having no fern pattern. Cervical discharges were also evaluated with digital pH meter. The observation of physical properties like color, consistency and odour of CVM reflected the presence of uterine infection and the same was confirmed with white side test (Bhat *et al.,* 2014). Uterine mucus samples were aseptically collected by using cytobrush and smears were prepared and stained with Geimsa stain for PMN cell count under oil immersion using 1000X magnification. The positive cases for uterine infection as confirmed by white side

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test (yellow color), uterine cytology (PMN cells >4%) and pH (>7.5) were excluded and only non-infectious repeat breeder cows were selected for the study. Artificial insemination was performed only in the cows showing typical fern pattern. Thus, total 36 cases of repeat breeding cows were taken for the experiment in three groups *viz.* Group-I (n=12) cows were treated with inj. GnRH @ 10 mcg by intramuscular route and Group-II (n=12) cows were assigned with inj. hCG @ 2000 IU intramuscularly on day 5 post-AI whereas, Group-III (n=12) cows were kept untreated post-AI as a control. The effect of treatment in different groups was evaluated in terms of first service conception rate as confirmed by trans-rectal examination after 60 days of AI.

Typical type of fern pattern with tertiary branching in cervical mucus is indicative of ovulatory heat, whereas, atypical fern pattern is observed in silent or weak estrus (Galhotra *et al.*, 1971). In present study, pH values of mucus sample in cows from group-I, II and III were recorded between 7.0-7.5. Samples of endometrial content were carrying <4% PMN cells with average number as 3.04±0.36% in group I, II and III. A positive correlation was reported between PMN cells and bacterial infection in uterus (Dutt *et al.*, 2017). If PMN cell count is >10%, the chances of subclinical endometritis are highly evident.

First service conception rate of group I, II and III was 58.3, 66.7 and 25.0%, whereas the number of services per conception was recorded as 1.7, 1.5 and 4.0, in the respective groups. The result of conception rate in group-I (58.7%) corroborated with an earlier study in GnRH treated non-infectious repeat breeder cows (62.5%; More *et al.,* 2012). In another study, higher conception rate (75%) was recorded (Pandey *et al.*, 2016) compared to current findings (66.7%) in repeat breeder crossbreed cows treated with hCG. Administration of hCG or GnRH in early luteal phase between d4-7 of estrus cycle induced pre-ovulatory luteinization of the dominant follicle of first wave and thereby formation of accessory CL. This may further

aid in progesterone concentration with a positive impact on embryo survival (Mehni *et al.*, 2012). Thus, the present study reflects that hCG treatment on day 5 post-AI was effective to achieve higher conception rate in non-infectious repeat breeder cows.

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