

The Impact of Vetaroline and Veteglan on Conception Rate in Cross Breed Milking Cows

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ABSTRACT

Increasing the calving interval by decreasing the milk and calf causes economical losses. Different methods are used in order to decrease the calving interval including various pharmacological compounds. The principal mechanism of impacts these components are regression corpus luteum and increasing the secretion of gonadotrophins in time silent heats. It seems that commercial compound of Vetaroline and Veteglan can cause decreasing the calving interval. In order to investigate the impact of these compounds 20 cross breed anestrous cows were chosen. Non-pregnancy of all cows examined by rectal examination. Cows randomized into four treatment including control, Vetaroline, Veteglan and combination of both. Animals were multiparous between age 2-4. Score the physical condition of cows was more than 2.5. All treatments were fed with the antiworms drug (Albendazol). Components administrated and controlled for 48 hours. Animals which showed estrous signs were inseminated, and cows which didn't show estrous signs were inseminated 48 hours after end of treatment regardless of observing estrous signs. For diagnosis of conception, 25 days after the artificial insemination, the milk samples were collected and progesterone concentration was assessed by RIA. After 45 days from artificial insemination, cows were examined by rectal examination. Data of experiment were compared using the statistical T test. The results showed that the commercial compounds of Vetaroline and Veteglan can cause estrous and increasing pregnancy. Hormonal analysis of progesterone shows a significant difference ($P < 0.05$) is between progesterone concentration in pregnant and non pregnant cows.

KEY WORD: Vetarolin, Veteglan, Calving interval

INTRODUCTION

One of the main economical factors in dairy industry is decreasing the calving intervals. A cow, when kept under favorable condition has the potential to produce one calf a year with 12 month calving interval (Stagg et al., 1995). Because the most profits of a herd is through the birth of a calf per year. The best calving interval in cows is 12-13 months. Thus, if a cow can't be pregnant after 45-60 days post partum, the calving interval will increase and can cause economical losses. Anestrus is one of the main factor that interferes with the productivity of cattle reared in tropical regions(Baruselli et al., 2004). The reproduction physiological progresses have led to creating new reproductive methods, So that by seeking assistance from them manager can improve reproductive processes. One of the most important methods is administration of hormones. Gonadotrophins have affected on the ovary, cause growing the follicles and make a new estrous cycle after parturition (20). One of analogous of GnRH is the commercial compound of Vetaroline which is entered to anterior part of hypophysis through portal system. It causes increasing the gonadotrophins secretion in the females and spermatogenesis in males. Its half life time is less than 3 hours, after this time peptides are degraded into amino acids and are excluded from the tissues. Application of these components in cow is infertility originated ovaries. Vetaroline with $PGF2\alpha$ use for controlling the exact time of ovulation (1).

The commercial compound of Veteglan causes estrous synchronization, controlling the exact time of ovulation and treatment of ovarian cysts, because of Veteglan is analog of $PGF2\alpha$. Veteglan causes the contraction of myometrium, distention of cervix and regression of Corpus luteum after 4-5 days from estrous. This compound is also used in ovarian disorders like in ovulatory delay or ovulation failure, ovarian cysts, better control of the estrous cycle at the time of artificial insemination and embryo transfer, making abortions in pathogenic pregnancies and metrium diseases after parturition. Vetarolin stimulates ovary and analog on GnRH(2).

It seems that commercial compounds of Vetaroline and Veteglan can have an important role in decreasing calving intervals. The objective of the present study was to investigate the effect of two compounds of Vetaroline and Veteglan and its interaction on estrous signs of cross breed milking cows.

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MATERIALS AND METHODS

Animals

This study was traditionally done a herd of 20 milking cows multiparous 2-4. The cows were milked twice per day. Animals were fed from alpha alpha hay and concentrate with mineral and vitamin supplement. Reproductive parameters e.g. ovarian follicles, uterine infection, active CL and ovarian cysts were assessed through rectal examinations. Estrous detection in the period of performing the study was done by visual observation. Cows were divided into four treatments and fed with Albendazol (anti worm).

Injection method

In the control treatment (I) each cow was intramuscularly received 3 milliliters of distilled water and then cows were controlled during 48 hours. In case of showing any estrous signs during 24 to 48 hours, cows were inseminated, otherwise after 48 hours they were inseminated regardless of observing estrous signs. Treatment II (Vetaroline) each cow was intramuscularly received 5 milliliters of the commercial compound of Vetaroline. treatment III (Veteglan) each cow intramuscularly received 2 milliliters of the commercial compound of Veteglan. Treatment IV (Vetaroline and Veteglan) at the first day of experiment, 5 milliliters of Vetaroline, and in the 7th day 2 milliliters of Veteglan were intramuscularly injection per cows. By observing estrous signs cows were inseminated otherwise, in the 9th days at the start of experiment again 5 milliliters of Vetaroline was injected and after 18 hours regardless of estrous signs, they were inseminated.

Sampling:

For the pregnancy diagnosis, hormonal methods and rectal examinations were used. Milk samples were prepared after 25 days from artificial insemination. Milk sample were collected with the help plastic tube volume 15 cc. Samples were centrifuged 25 minutes, with the 13200 rpm. The skim milk and milk fat were kept separately in - 20°C. Concentration of progesterone was done with the help of RIA method.

RESULTS

Among the 20 chosen cows in this study, 2 cows had leutal cysts and 18 other cows had CL. No cow from the treatment I (distilled water) and the treatment II (Vetaroline) in the interval between 24 to 48 hours after injecting the drug showed estrous signs. In the treatment III, one of the cows had active CL, and 24 hours after injecting, estrous signs were seen. In the treatment IV (Vetaroline & Veteglan), 24 hours after injection, estrous signs were observed.

Table 1: effect of commercial compound (Vetarolin and Veteglan) on CL regression leutal cyst and estrus sings

Type of compound	CL regression	leutal cyst	estrous sign after injection
Distilled water(T1)	negative	negative	negative
Vetaroline(T2)	negative	negative	negative
Veteglan(T3)	positive	positive	positive
Vetaroline &Veteglan(T\$)	positive	positive	positive

from 20 cows experimented in this study, 16 cows were inseminated. After sampling the milk, in treatment IV, estrous signs in one cow were observed during several times.

Table 2: explanation of treatments inseminated cows

Treatments	number of cows	number & insemination	number of sample	of analyzed sample
I	5	3	3	3
II	5	3	3	3
III	5	5	5	5
IV	5	5	5	4
total	20	16	16	15

In the control treatment (I), concentration of milk progesterone was high. it became clear that they are non-pregnant (with the help of rectal examination). In experimental treatments, some cows were diagnosed as pregnant (Table 2).

The results of the milks progesterone concentration in pregnant and non-pregnant cows were showed that the average of the milks progesterone concentration in pregnant and non-pregnant groups had a signification difference at the %5 level. The average of progesterone concentration was 0.18 and 2.49 ng/ml for non-pregnant and pregnant group respectively.

DISCUSSION

In spite of ovary cysts and active CL in the third and fourth treatments, it seems that the commercial compound of Veteglan which is prostaglandin analogues, can regress CL and ovarian cysts. A high percentage of unsuccessful pregnancies allocate to the embryo mortality. Most losses of pregnancy rate from 25 to 40 percent is because of the embryos death from the time of insemination up to the end of implantation. Embryo mortality depends on chromosomal anomaly, hormonal disorders, milking, nutrition, disease, immunological and environmental parameters. Because of this, the probability of the birth of a calf which is inseminated will not be more than %60 (20). Variation of estrogen and progesterone balance causes the embryos death before the implantation. Blood progesterone concentration in ewes having embryo losses were less than those which had a successful pregnancy. Embryo can't produce enough interferon, can't support CL, therefore will die because of decreasing the progesterone. In milking cows, embryo mortality is more and its reasons have been known as decreasing defensive system, Milking stress and lack of developing the endometrium. The fetus mortality in milking cows was also reported 5-12 up to 15-20 percent. Genetic anomalies cause at least %5 of embryo mortality in cows. It seems that by increasing the milk production mortality increases too. In some varieties, by getting older, decreasing rate have been observed (20). Genetic improvements in milking cows have increased the milk production, but decrease the rate of pregnancy. Also, the low concentration of glucose and insulin in blood may decrease the rate of LH secretion and can limit the response of ovary to gonadotrophins. secretion of LH after parturition, is the most important factor for growing and developing follicles. Some factors like suckling and poor nutrition have negative effects on LH secretion (5). It seems that some cows get pregnant after the artificial insemination, but for various reason they have been aborted. Calf birth as the best parameter in assessing the effect of these compounds. Many researchers have suggested that decreasing of LH concentration is because of the low amount of glucose. Although when insulin is low, the decrease of LH wave continues for a longer time. May be low insulin concentrations have directly affected on LH secretion more than low glucose concentrations. Hypothalamus has a regulatory role on insulin, and it regulate the glucose metabolism in nervous tissues(16).

Since progesterone is for implantation and making a suitable environment for embryo, moreover CL is the only source of progesterone at the beginning of pregnancy, so there should be some functions to prevent from CL regression which happens regularly at the end of ovarian cycle. 80 to 85% of cows which were diagnosed as pregnant on the basis of the milk progesterone concentration were parturated successfully (1). As a result, the progesterone concentration measurement is used as a pregnancy index. The results show that the milks progesterone level at the first weeks after parturition is lower than 2 ng/ml, that the lowness of progesterone concentration is the result of ovaries inactivity(17). The highness progesterone concentration in the milk samples is suggestive of CL activity. The correlation between the high progesterone concentration and cows pregnancy is about %80(20). In the following cases, the progesterone level was high, the cows were n't be pregnant but CL activity continued for some reasons. Sampling before abortion and reproductive anomalies which are mistaken with pregnancy (20). In the control the amount progesterone concentration of milk was shown as high, but that after performing rectal experiment, it became clear that these cows were non-pregnant. Therefore, it seems that the highness of milk progesterone concentration is the result of CL resistance which was diagnosed by the rectal examination and of course injecting distilled water for this treatment(control) had no effect on regression of the CL activity. In other treatments, the high progesterone concentration and assessing the rectal examination are suggestive of the effect of commercial drugs of Vetaroline and Veteglan on ovarian cysts. Using the milk fat for assessing progesterone is very helpful, because between 75 to 80 percent, milk progesterone accompanies with milk fat, thus the milk fat and amount of progesterone concentration have relations with each other. In cow's milk fat, progesterone concentration are observed 1.68 – 0.14 ng/ml in leutal and estrous phases respectively. Milk progesterone concentration can be used in pregnancy diagnosis with %89 of precision (3).

The progesterone concentration of some pregnant cows which were treated by Vetaroline and Veteglan was low (0.56 and 0.8) while they were diagnosed as pregnant by rectal examination. It seems that progesterone level for continuing of pregnancy in this treatment was low. Mann and Lamming 1999, observed that using of progesterone in 6 days after the artificial insemination causes increasing the amount of pregnancy rate (13).

In milking cows, the pregnancy rate in 28 - 32 days after the artificial insemination was 40 to 70, in heifer 75 and in beef cows 90 percent. Thus the rate of fetus survivance was 93 percent until the 8th day and it decreased until the 12th day %56 after the artificial insemination (18).

Non return rat in milking cows was reported about 10 percent more than milking heifer. In milking cows, all physiological factors causing low pregnancy rat were not recognized correctly but some of them includes stresses coming from a high milk production, negative balance of energy, toxic effects coming from urea nitrogen, inability in responding to changes of the environment temperature and losing weight of the animal at the beginning of the pregnancy (18). Given that this study involved small numbers of animals. According to the results of this experiment

in the third and fourth treatments after injecting, estrous signs were observed and cows were inseminated. Several studies have shown that cows which have lower progesterone concentration have a lower conception rate (10-14). In pregnant and in non-pregnant cows, progesterone concentrations were 3.79 and 0.15 ng/ml respectively. There is a positive correlation between plasma progesterone concentrations in the diestrus phase preceding insemination and subsequent conception rate (6-9). The function of these compounds especially Veteglan and the fourth treatment (Vetaroline + Veteglan) can be effective on CL, ovary cysts (leuteolysis) so can be increase the conception rate. It seems that, these treatments cause to be removed negative feedback of progesterone on the hypothalamus. After this act, LH concentration reaches to its peak and causes ovulation and starting the ovary activity. Further studies are needed to investigate different of treating in order to improve calving interval.

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