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EFFICIENCY OF TREATMENT OF FOLLICULAR CYSTS IN COWS

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ABSTRACT

The aim of the work was to compare two protocols of treatment of cows with follicular cysts. 368 cows of Holstein bred were assigned for the experiment. They were 2-5 years old with average milk production of 9580 kg. The cows with ovarian cysts were randomly divided into two groups according to the treatment method. Diagnostics of the follicular cyst was performed by a transrectal ultrasonographic examination by 5 MHz linear probe. Group 1 consisted of cows (186) which were treated with GnRH on the 0 and 7th day (50µg, *im*; Supergestran), PGF2α on 14th day (25mg, *im*; Oestrophan, Spofa), GnRH on 16th day (50µg, *im*). Insemination was done on the 17th day (20±4 hours after GnRH). Group 2 consisted of cows (182) treated with GnRH on 0 day (50 µg), PGF2α (25 mg) on 7th day and GnRH (50 µg) on 9th day. Insemination was done on the 10th day (20±4 hours after GnRH). The cows were ultrasonographically examined on the 0 and 7th day. On the 7th day after first treatment with GnRH better results ($P< 0.05$) were ascertained in the second group after identical treatment. In the subgroup 60 to 70 days *post-partum* presence of CL was of 4.54 % more and in the subgroup at 101-150 days *post-partum* the number of CL was up to 22.18 % more. This difference among the groups makes 28.99 %. The cows treated between 71st and 100th days *post-partum* in both groups had almost identical occurrence of preovulatory follicles. Significantly better efficiency ($P<0.05$) was achieved in the second group (31.32 %). More preovulatory follicles were ascertained at 60 to 70 days *post-partum* (up to 4.54 % more; $P<0.05$) and at 101-150 days (up to 22.18 % more). From the initial number of animals assigned for the treatment after insemination until 30 days only 30.65 and 36.65 % cows, respectively, remained pregnant. The most cows were concepted in the subgroup of 71-100 days of puerperium (15.59 % or 14.84 %). Both protocols of the treatment showed to be effective methods for the therapy of follicular cystic degeneration.

Key words: cows; ovarian cysts; Ovsynch

INTRODUCTION

Reproductive efficiency is one of the most important factors determining the profitability of the herd of dairy cows. Calving interval is the deciding parameter used for assessment of the reproductive efficiency. One-year calving interval is considered as economically advantageous as well as physiologically acceptable (Schmidt, 1989). Regular and sufficiently intensive puerperal ovarian activity, on-time display and estrus detection, properly scheduled insemination within 85 day *peurperium* despite the high production of milk are necessary for reaching such interval with breedingcows. *Puerperium* is a period of involutional processes of sex organs of a cow after parturition. According to Hajurka (2005) involution of the uterus of cows consists of three processes: from the contraction of *myometrium*, loss of tissue and shedding the surface of *carunculs* and renewal of the epithelium of *endometrium*. The period within 20-30 days after parturition is considered as physiological course of *uterus* involution (Doležel, 1989). Among the basic indicators of successfully proceeding *puerperium* in cows are non-malodorous *lochie*, end of its discharge up to 14 days after parturition, first puerperal estrus during the fourth week from parturition with following estrus in three week time and normal estrous mucus (Bouška *et al*., 2006). Effective puerperal estrus, in the period from 40th to 100th day after parturition, is in the herds with high milk production often a problem, which is associated with high occurrence of follicular cysts (6-30 %), while in

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80 % of cows estrus is absent and in 20 % of cows estrus can be very intensive (Šťastný and Lacková, 2004).

Follicular cysts in cows are hypertrophic follicles which do not ovulate in the estrus period (Garverick, 1999). Since these cows remain temporarily sterile they make an economic loss for the breeder. The loss depends on the frequency of occurrence of cysts. The exact cause of ovarian cysts is unknown, but the lack of hypothalamic gonadotropin – releasing hormone (GnRH) in the estrus period plays an important role in its pathogenesis (Gumen *et al*., 2003). Lack of GnRH can have various reasons, from genetic to alimentary and stress causing reasons. These can be peripartal disorders, milk fever, retention of placenta, *endometritis*, high content of oestrogens in the fodder, etc. The lack of endogenous GnRH is shown also by the positive reaction to the application of exogenous GnRH to cows with follicular cysts which induces ovulation of the follicle or luteinisation of the ovarian cyst (Fricke *et al*., 1998; Garverick, 1999, Stevenson, 2012) and stimulates new follicular wave. Its application to cows without ovarian cyst via new follicular wave can cause increased occurrence of follicle *atresia* (MacMillan and Thatcher, 1991). Protocol for synchronisation of ovulation and timing of insemination (Ovsynch), which can affect the percentage of gravidity if it is timed to the early luteal phase, is used for cows without ovarian cysts at a specific stage of estrous cycle (Pursley *et al*., 1997; Moreira *et al*., 2000). According to Ježková (2006) is it possible to avoid these problems by examination of the state of health in *puerperium* and by assessment of the quality of feed ration. Regular puerperal examination of the reproductive organs and thorough observation of the displays of estrus as well as usage of instrumental technique in clinical gynaecological practice can put this problem under effective control which could increase the possibilities of early cyst elimination.

The aim of the work was to compare two protocols of treatment of cows with follicular cysts.

MATERIAL AND METHODS

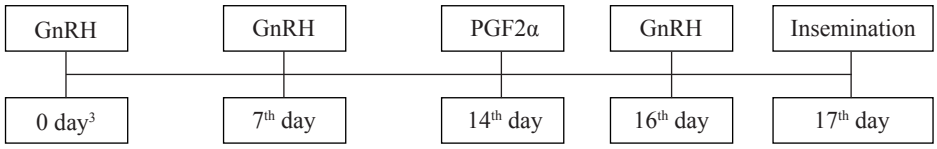
368 cows of Holstein bred at the age from 2 to 5 years with average productivity of 9580 kg of milk in the period from April to August were assigned for the experiment. The cows were stabled freely in categories according to productivity. Gynaecological examination of cows was conducted in the herd in 14 day intervals since 60±7 days after parturition. Cows with follicle cysts were afterwards divided into two groups according to the method of treatment. Diagnostics of follicular cysts was conducted using transrectal ultrasonographic examination (DP-3300 Vet Digital Ultrasonic Imaging System, Midray Medical Corp. USA) with 5 MHz linear probe. As a criterion for cyst identification was the size of follicle (> 25mm), the wall thickness of the follicle and the absence of *corpus luteum* (CL). Diagnostics of gravidity was conducted following 30±3 days after insemination using ultrasonographic examination and following 60±5 days manually using rectal examination. The occurrence of follicular cysts of various forms after the parturition (< 70, 71-100, 101-150, > 150 days), the presence of corpus luteum (CL) seven days after treatment with GnRH and the presence of preovulatory follicles at the day of insemination were assessed statistically by the computational software of SAS. Pregnancy rate per AI was defined as the number of pregnant cows to total number of animals.

The group 1 consisted of cows (186) treated with GnRH (50µg, *im*; Supergestran) on 0th and 7th day, PGF2α (25mg, *im*; Oestrophan Spofa) on 14th day and GnRH (50µg, *im*) on 16th day. Insemination was conducted on the 17th day (20±4 hours after the treatment with GnRH).

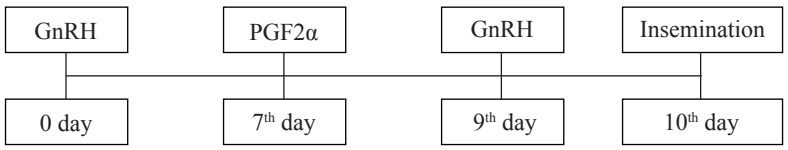
The group 2 consisted of cows (182) treated with GnRH on 0th day (50 µg), PGF2α (25 mg) on 7th day and GnRH (50 µg) on the 9th day. Insemination was conducted on the 10th day (20±4 hours after treatment with by GnRH). The cows were ultrasonographically examined on the 0th day and 7th day.

Protocols of the treatment

group 1



group 2



RESULTS AND DISCUSSION

Follicular cysts were diagnosed in 368 cows. These were treated by two methods. The treatment in both groups started (0th day) by application of GnRH. The period from the treatment to insemination in the first group was 17 days and in the second group - 10 days. Within both groups the animals were divided into subgroups according to the length of puerperal period when the ovarian cysts were detected.

The results of presence of CL on 7th day after initial treatment with by GnRH are shown in the Table 1. Better results (P< 0.05) were ascertained in the second group, although the performed treatment was identical. There was 4.54 % more CL present in the subgroup of 60 - 70 days *post-partum* of the group 2. The difference in the second subgroup of 101-150 days post-partum

Table 1: Presence of CL on the 7th day after the treatment of cows with GnRH at different time of puerperium

CL/7th day	Group 1		Group 2	
Days post partum	n-186	%	n 182	%
60 - 70	12	6.45	20	10.99[a]
71-100	39	20.97	39	21.43
101-150	17	9.14	57	31.32[a]
> 150	14	7.53	17	9.34
total	82/186	44.09	133/182	73.08[a]

a-P<0.05

Table 2: Presence of preovulatory follicles at the day of artificial insemination

Days post partum	Group 1		Group 2	
	n-186	%	n 182	%
60 - 70	11	5.9	19	10.44[a]
71-100	37	19.89	36	19.78
101-150	17	9.14	57	31.32[a]
> 150	9	4.83	12	6.59
total	74/186	39.78	124/182	68.13[a]

a-P<0.05

Table 3: Gravidity on the 30th day after artificial insemination

Days post partum	Group 1		Group 2	
	n-186	%	n 182	%
60 - 70	7	3.76	16	8.79
71-100	29	15.59	27	14.84
101-150	17	9.14	14	7.69
> 150	4	2.15	9	4.95
total	57/186	30.65	66/182	36.26

between groups was 22.18 %. Total difference between the groups makes 28.99 %. Similar findings were reported by Hendricks (2004), who used the same protocols of treatment, which he rationalized with different levels of progesterone at the time when the cows were put into observation. These differences are probably resulting from random categorization of cows into groups. It could result in the fact that cows in the second group had more even and lower progesterone concentration or lower ovary sensitivity to GnRH. The tendency of CL presence is about the same, when the most CL were ascertained in the subgroup between 71st and 150th day, in the second group it was mainly after the 100th day of puerperium.

The cows in both groups treated between the 71st and 100th day of puerperium showed almost identical occurrence of preovulatory follicles. As results from the Table 2, there is a difference in the efficiency among treatments presented by the presence of preovulatory follicles, which results from the differentiated treatment procedure since the 7th day after putting the cows into experiment. Significantly higher efficiency ($P<0.05$) was reached in the second group (31.32 %). Similarly to the CL presence, more preovulatory follicles (4.54 %) were ascertained in the subgroup of 60 to 70 days post-partum ($P<0.05$). It was at 22.18 % more in the group of 101-150 days post-partum. It is probable that the combination of application of PGF2α on the 7th day and GnRH on the 9th day was more effective also from the point of already mentioned individual sensitivity. According to Moreira *et al.* (2000), cows treated according to Ovsynch protocol in the early diestrum (group 2) respond to the treatment more intensively. The cows between 71st and 100th day post-partum responded less intensively than the cows between 101-150 days post-partum. This supports the assumption about the ovary sensitivity, since at that time the milk production culminated, which was probably the dominant factor (Lopez-Gatius *et al*., 2002). Despite stated significant differences in the ovarian reaction in both groups there were not ascertained significant differences from the point of treatment protocol in the gravidity of the animals on the 30th day at ultrasonographic examination (Tab.3). Thirty days after insemination there were 30.65 % and 36.26 % of pregnant cows from the initial number of treated animals. The most cows were concepted in the subgroup of 71-100 days of puerperium (15.59 % or 14.84 %). Both protocols of treatment turned out as effective methods of therapy of ovarian cyst degeneration. Higher efficiency is shown from the point of duration of the treatment at shortened protocol used in the second group (17 or 10 days), as well as from the point of manipulation with animals during their examination and treatment and from the point of cost of medication (GnRH was repeatedly applied on 7th day in the first group). Ascertained facts show the importance of the observation and on-time treatment of ovarian cystic disorder, because their treatment after the culmination of lactation curve does not have significant effect on their treatment, but only decreases losses to the reproduction process which are caused by ovarian cysts (Gossen and Hoedemaker, 2006).

CONCLUSION

Cystic ovarian disease in dairy cattle occurs most frequently during the post-partum period up to 70 days after calving. In conclusion, the results of this study suggest that fertility may not be different between cows with ovarian cysts treated with either the shorter or the longer Ovsynch protocol in this dairy herd.

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