EFFECT OF DYSTOCIA AND RETAINED FETAL MEMBRANES ON MILK PRODUCTION DURING POSTPARTUM PERIOD IN DAIRY COWS IN IRAQ

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ABSTRACT

The aim of this study was to recognize the effect of dystocia and retained fetal membranes on the milk production of dairy cows during puerperal period. This study was conducted in alwahda station of dairy cows and milk production in southern Iraq from 2/1/2015 to 2/1/2018. The study included 223 cows which were divided into three groups according to their milk yield. The first group contains 75 cows with milk production less than (10 kgs) per cow^{-1} day^{-1}, in this group 54 cows (72%) showed normal parturition, while 21 cows (28%) had dystocia and retained fetal membranes. In the second group, there were 123 cows with milk production range (11-20 kgs) per cow^{-1} day^{-1}, 113 cows (92%) in this group had normal parturition, whereas 10 cows (7.9%) only experiencing dystocia and 16 cows (13.2%) in the same group had retained fetal membranes, with significantly difference between first and second groups at ($P<0.01$). The third group contains 25 cows with milk production more than (20kgs) per cow^{-1} day^{-1}, 24 cows had normal parturition (96%), while one cow (4%) suffered from dystocia and retained fetal membranes, with significantly difference at ($P<0.01$) from first and second groups. It was concluded that dystocia and retained fetal membranes have noticeable effect on the cow milk yield during puerperal period.

Key words: dystocia, retained fetal membranes, milk yield, dairy cows.

INTRODUCTION

Optimal reproductive performance is considered as the essential basis, that the milk production in dairy stations depends on, since reproductive performance influences positively on the cow milk yield (Barrier and Haskell, 2011). There are many reasons and problems lead to failure of reproductive performance and subfertility (Kaya *et al.*, 2015), and consequently result in the economic losses in the dairy stations, and through three axis, weak reproductive efficiency of cows, shortening productive lifetime and decreasing milk yield (Rajhala and Grohen,1998).

Dystocia is one of the most important conditions that influence negatively the reproductive performance, and defined as prolonged or difficult birth or parturition and requires assistance (Yehualu *et al.*, 2017). There are different causes associated with dystocia in dairy cows, which result from both maternal and fetal causes (Hafez and Hafez, 2000). The related fetus causes include absolute and relative oversized fetus, faulty disposition of fetus in the birth canal (Noakes *et al.*, 2001), while the related maternal origin of dystocia include constriction of birth canal, uterine inertia and dilation failure of cervix (Lombard *et al.*, 2007). Other causes of this condition include feto-maternal disproportion, uterine torsion and fetal anomalies (Dohoo *et al.*, 1984).

The incidence of dystocia varies among cows, and it is most commonly in heifers than adults (Lombard *et al.*, 2007). Dystocia has obvious impacts on the reproductive performance and animal milk yielding (Barrier and Haskell, 2011), since leading to increased still births, days open, calving interval in the subsequent milk cycles (Grohen *et al.*, 1990 ; Kaya *et al.*, 2015). On the other hand many studies have indicated to the interrelationship between dystocia and low milk yield (Tenhagen *et al.*, 2007) depending on the whole 305 days cow's milk cycle. Dematawewa and Berger (1997) confirmed the sensible decreasing in the milk yielding within later 30 days post partum in the cows have suffered from dystocia and its complications. Erb (1987) indicated that the surgical treated dystocias led to low milk yielding about 9.5% of milk cycle of the treated cows.

Retained fetal membranes is defined as the failure of cow to expel fetal membranes within thirty minutes to 12 hours post parturition (Sharma *et al.*, 2017). Therefore the fetal membranes are considered to be retained if remain more than 12 hours (Taylor *et al.*, 2010 ; Noakes *et al.*, 2009). The incidence of this case varies with range 4-16% (Sharma *et al.*, 2017 ; Sarder *et al.*, 2010) and increased in herds suffering managemental problems (Andrews *et al.*, 2004) and the dairy cows are more prone to this case compared to beef cows (LeBlanc 2008 ; Abdisa, 2018). Adane *et al.*, (2014) have revealed the retained fetal membranes has indirect effect on the milk yielding of animal by leading to poor conception, prolonged calving interval, since 4% of milk cycle will decrease in retained fetal membranes cows. The maintenance of healthy cows is a crucial step to maintain good fertility and milk yielding (Abdisa, 2018 ; Oltenacu *et al.*, 1984).

MATERILAS AND METHODS

This study was conducted in Al wahda dairy station located south west of Baghdad from 2/1/2015 to 2/1/2018, and included (223) hybrids between Holstein and Friesian breed cows, and the age of these cows ranges between 3 to ten years. The feeding of these cows comprised green fodders and roughages, in addition to concentrated food. The whole normal births, difficult births and retained fetal membranes cases and milk yielding of cows during 30 day postpartum were recorded. The studied cows were divided into three group:
First group: included 75 cows with milk yielding less than 10 Kgs per day.
Second group: included 123 cows with milk yielding about 11-20 Kgs per day.
Third group: contained 25 cows with milk yielding more than 20 Kgs per day.

The results were analyzed statistically using, Chi-square to significant compare among the ratios of normal births, difficult births and retained fetal membranes for these groups (SAS. 2012).

RESULTS AND DISCUSSIONS

The first group (75) cows, through which the daily milk yielding of cows was less than 10 Kgs, 21 cows (28%) experiencing dystocia, this ratio is relatively high and consequently leads to increasing incidence of retained placenta and uterine problems during puerperium period and this reflects negatively on the subsequent reproductive performance, and on the general animal health and milk yield of the animals (Kaya *et al.*, 2015). These results are in accord with Dejemali *et al.*, (1987) who stated that the decreasing milk yielding is associated with dystocia and it is ramifications. But Rajhala and Grohen (1998) found dystocia has no significant effect on milk yielding of the cows.

The same group also reveals that the rising in the cases of the retained fetal membranes, hence 21 cows (28%) of the first group were affected, and this is a rationale due to the increasing of dystocia conditions. Dawod *et al.*, (2015) have indicated that dystocia increases the possibility of occurrence of retained placenta about 4 folded and leading the cows being infected with uterine problems.

Gaafar *et al.*, (2010) and Kaya *et al.*, (2015) believed that retained fetal membranes being as impact factor on the milk production during the first four weeks postpartum, and the low milk yielding is accompanied with prolonged duration of retained fetal membranes and its complications, specifically within the first five days after parturition (Van werven *et al.*, 1992), but (Rajhala and

Grohen, 1998) didn't find any direct effect of retained fetal membranes on the milk production within (305) days of milk cycle (Table 1).

Table 1. Distribution of studied sample according to group of milk yielding, dystocia, eutocia and retained fetal membranes (No. and %)

The group	Eutocia	Dystocia	Chi square	Cows without retained fetal membranes	Cows have retained fetal membranes	Chi square
First group (75 cows)	54 (72%)	21 (28%)	12.63**	54 (72%)	21 (28%)	12.63**
Second group (123 cows)	113 (92.03%)	10 (7.97%)	14.41**	107 (87%)	16 (13%)	13.85**
Third group (25 cows)	24 (96%)	1 (4%)	14.93**	24 (96%)	1 (4%)	14.93**
Chi square	9.294 **		---	9.528 **		---
(P<0.01)**						

The results of the study have showed that the second group (123) cows, with milk yielding varied 11-20 Kgs, 10 (7.97%) cows contained in this group suffered dystocia with significant difference from the first group at (P<0.01). it has been shown in the comparison with the first group, that the cases of dystocia are relatively less than in the first group, which reflected positively on the general health of the animals and consequently on the milk production (Dubuc *et al.*, 2011). Other studies have found the condition of dystocia has no evident effect on the low milk production of cows during the milk cycle (Kaya *et al.*, 2015). In this study 16 cows(13%) suffered retained placenta with significant difference from the first group at (P<0.01), it has been seen that the decreasing in the incidence rate of retained placenta in this group has positive effect on the milk production during the puerperium, specifically during first four weeks postpartum, and this in agreement with (Dawod *et al.*, 2015 ; Rajhal and Grohen, 1998) who found that the cases of retained placenta have no considerable effect on the milk production during 305 days milk cycle.

The results of this study indicated that the third group which contains (25) cows through which the daily milk yielding was more than 20 Kgs, one cow in this group experienced dystocia and retained placenta (4%) with significant difference from the first and second groups. It has been seen that the total milk production in this group is more than in both first and second groups, these results reveal that the decreasing incidence of both dystocia and retained placenta led to apparent increasing of milk production in the individuals of this group. And reflected positively on the general health of these cows. These

results have agreed with (Dawod *et al.*, 2015 and Andraws *et al.*, 2004) who revealed that the maintaining healthy cows is the optimal choice in maintenance of high milk production cows with high fertility, hence the number of culled cows would decrease when the whole cows are healthy and devoid from reproductive problems (Bell *et al.*, 2010 ; Gaafar *et al.*, 2010) (Table 1).

It has been concluded according to the findings of this study, that the parturient problems like dystocia and retained fetal membranes have obvious effects on the milk production during postpartum period in dairy cows.

REFERENCES

Abdisa, T. 2018. Review on the reproductive health problem of dairy cattle. *Dairy and Vet. Sci. J.*, 5(1): 1-12.

Adane, H., T. Yisehak and T. Niguse. 2014. Assessment of major reproductive disorders of dairy cattle in Urban and Per Urban Area of Hosanna, Southern Ethiopia. *Animal and Veterinary Sciences*. 2(5): 135-141.

Andrews, A. H., R. W. Blowey, H. Boyd and R. G. Eddy. 2004. Bovine Medicine Disease and Husbandry of Cattle. 2th ed., Blackwell publishing, USA.

Barrier, A. C. and M. J. Haskell. 2011. Calving difficulty in dairy cows has a longer effect on saleable milk yield than on estimated milk production. *J. Dairy Sci.*, 94: 1804-1812.

Bell, M. J., E. Wall, G. Russell, D. J. Roberts and G. Simm. 2010. Risk factors for culling in Holstein-Friesian dairy cows. *Vet. Rec.*, 167: 238-240.

Dawod, A. 1., I. Mostafa, H. El-Baz, T. Abdel-Hamid and M. M. Fat. 2015. Risks of some uterine affection on reproduction and milk yield of high yielding cows. *J. Veterinar. Sci. Technolo.*, 6: 1-5.

Dematawewa, C. M. B. and P. J. Berger. 1997. Effect of dystocia on yield, fertility, and cow losses and an economic evaluation of dystocia scores for Holsteins. *J. Dairy Sci.*, 80: 754-761.

Djemali, M. A., E. Freman and P. I. Berger. 1987. Reporting of dystocia scores and effects of dystocia on production, days open from dams herd improvement data. *J. Dairy Sci.*, 70: 423-431.

Dohoo, I. R., S. W. Martin, A. H. Meek and W. C. D. Sandals. 1984. Disease, production and culling in Holstein-Friesian cows 111 disease and production as determinants of disease. *Prev. Vet. Med.*, 2: 671-690.

Dubuc, J., T. F. Duffield, K. E. Leslie, J. S. Walton and S. J. Leblanc. 2011. Effect of postpartum uterine diseases on milk production and culling in dairy cows. *J. Dairy Sci.*, 94: 1339-1346.

Erb, H. N. 1987. Interrelationships among production and clinical disease in dairy cattle: A review. *Can. Vet. J.*, 28: 326.

Gaafar, R. M. A., S. M. Shamiah, A. A. Shitta and H. A. B. Ganah. 2010. Factors affecting retention of placenta and its influence on postpartum reproductive performance and milk production in Friesian cows. *Slovak Journal of Animal Science*. 43: 6-12.

Grohn, Y. T., H. N. Erb, C. E. McCulloch and H. S. Saloneimi. 1990. Epidemiology of reproductive disorders in dairy cattle: Associations among host characteristics, disease and production. *Prev. Vet. Med.*, 8: 25-39.

Hafez, B. and E. S. E. Hafez. 2000. Reproduction in Farm Animals. 7th ed., Lippincott Williams and Wilkins. U.S.A.

Kaya, I., C. Uzmay and T. Ayyilmaz. 2015. Effect of dystocia on milk production and reproduction in subsequent lactation in a Turkish Holstein Herd. *Turk. J. Vet. Anim. Sci.*, 39: 87-95.

LeBlanc, S. J. 2008. Postpartum uterine disease and dairy herd reproductive performance: a review. *Vet. J.*, 176: 102-114.

Lombard, J. E., S. M. Garry, F. B. Tomlinson and L. P. Garber. 2007. Impact of dystocia on health and survival of dairy calves. *J. Dairy Sci.*, 90: 1751-1760.

Noakes, D. E., T. J. Parkinson and G. C. W. England. 2001. Arthurs Veterinary Reproduction and Obstetrics. 8th ed., Saunders Elsevier Limited. UK.

Noakes, E. D., J. T. Parkinson and C. G. England. 2009. Veterinary Reproduction and Obstetrics. 9th ed. Saunders Elsevier Limited. U.K.

Oltenacu, P. A., T. H. Britt, R. K. Braun and R. W. Mellenberger. 1984. Effect of health status on culling and reproductive performance of Holstein cows. *J. Dairy Sci.*, 67: 1783.

Rajhala, P. J. and Y. T. Grohen. 1998. Effect of dystocia, retained placenta, and metritis on milk yield in dairy cows. *J. Dairy Sci.*, 81(12): 3172-3181.

Sarder, M. J. U., M. I. Z. Moni and S. Aktar. 2010. Prevalence of reproductive disorders of crossbred cows in the Rajshahi district of Bangladesh. *SAARC Journal of Agriculture*. 8(2): 65-75.

SAS. 2012. Statistical Analysis System, User's Guide. Statistical. Version 9.1thed. SAS. Inst. Inc. Cary. N.C. USA.

Sharma, M., Y. Bhat, N. Sharma and S. Rawat. 2017. Effect of parity of animal and season of year on the rate of retention of placenta in dairy cattle. *Int. J. Curr. Microbiol. App. Sci.*, 6(12): 3103-3108.

Taylor, F., T. Brazil and M. Hillyer. 2010. Diagnostic Techniques in Equine Medicine. Second Edition, Saunders Elsevier. UK.

Tenhagen, B. A., A. Helmbold and W. Hellweiser. 2007. Effect of various degrees of dystocia in dairy cattle on calf viability, milk production, fertility and culling. *J. Vet. Med. Series A.*, 98-102.

Van werven, T., Y. H. Schukken, J. Lioyd, A. Brand, H. T. Heeringa and A. Shea. 1992. Effects of duration of retained placenta on reproduction, milk production, postpartum disease and culling rate. *Theriogenology*, 37: 1191-1203.

Yehualu, B., G. Bassazin, M. Sewalem and B. Mekonene. 2017. Review in the predisposing factors, causes and economic impact of dystocia in dairy cows. *J. Reprod. and Infertility.*, 8(3): 72-81.

دراسة تأثير كل من عسر الولادة واحتباس المشيمة في انتاج الحليب خلال فترة النفاس في الابقار الحلوب

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المستخلص

هدفت هذه الدراسة للتعرف على تأثير كل من عسر الولادة واحتباس الأغشية الجنينية على إنتاج الحليب في أبقار الحليب خلال فترة النفاس. أجريت هذه الدراسة في محطة أبقار حليب الوحدة والواقعة جنوبي العراق في الفترة الممتدة من 2015/1/2 ولغاية 2018/1/2. شملت الدراسة 223 بقرة والتي قسمت إلى ثلاث مجاميع حسب كمية الحليب المنتجة من قبل هذه الأبقار. المجموعة الأولى تحتوي عل 75 بقرة مع إنتاج حليب اقل من (10كيلوغرام) لكل بقرة$^{-1}$ لليوم$^{-1}$ الواحد، 54 بقرة (72%) في هذه المجموعة كانت ذات ولادة طبيعية، في حين 21 بقرة (28%) عانت من عسر ولادة مع احتباس للأغشية الجنينية. احتوت المجموعة الثانية على 123 بقرة مع معدل إنتاج حليب تراوح بين (11-20 كيلوغرام) لكل بقرة$^{-1}$ لليوم$^{-1}$ الواحد، 113 بقرة (92%) في هذه المجموعة كانت لديها ولادة طبيعية، بينما 10 أبقار (7.9%) فقط كانت تعاني من عسر ولادة و16 بقرة (13.2%) في نفس المجموعة كان لديها احتباس للأغشية الجنينية، مع فارق إحصائي معنوي بين المجموعة الأولى والثانية عند ($P<0.01$). احتوت المجموعة الثالثة على 25 بقرة مع إنتاج حليب أكثر من (20 كيلوغرام) كل بقرة$^{-1}$ لليوم$^{-1}$ الواحد، 24 بقرة (96%) كانت لديها ولادات طبيعية في حين كان هنالك بقرة واحدة (4%) عانت من عسر ولادة مع احتباس للأغشية الجنينية، وبفارق إحصائي معنوي عند ($P<0.01$) بين المجموعة الثالثة والمجموعتين الأولى والثانية. يستنتج من هذه الدراسة أن كل من عسر الولادة واحتباس الأغشية الجنينية لديه تأثير بارز على إنتاج الحليب لدى الأبقار خلال فترة النفاس.

الكلمات المفتاحية: عسر ولادة، احتباس الأغشية الجنينية، إنتاج الحليب، أبقار حليب.