

Co-Triggering of Diseases during Transitional Period in Dairy Animals of Punjab

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ABSTRACT

The present study was undertaken to determine the predisposition of one transitional disease on the other in various dairy animals of Punjab. For this purpose, a total of 250 respondents were randomly selected and were interviewed personally from various parts of Punjab through a structured interview schedule. Among the various transitional diseases in dairy farms, anoestrus was found to be high (59.00%) followed by mastitis (52.00%). Dystocia was found to be highly significant ($p < 0.01$) with transitional diseases such as Retention of Placenta (ROP) and metritis. ROP had highly significant variation ($p < 0.01$) with diseases such as dystocia, mastitis, ketosis and metritis. Anoestrus was found to be significant ($p < 0.05$) with repeat breeding. Ketosis was found to be highly significant with anoestrus ($p < 0.01$). Milk fever varied significantly with dystocia and ROP ($p < 0.05$). Metritis had significance with dystocia, mastitis, anoestrus and milk fever ($p < 0.01$). Also, repeat breeding was highly significant ($p < 0.01$) with mastitis. Thus, it was concluded that presence of one transitional disease can predispose the dairy animal to other transitional diseases as well. Hence, farmers are educated on transitional disease management through training and other extension and advisory services.

Keywords: Dairy animals, Predisposition, Transitional disease.

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INTRODUCTION

Farmers rear dairy animals with an objective to run their farms profitably. It is important to build the capacity of the dairy farmers in dairy farming management practices including health and nutrition management. Non-adoption of recommended management practices can lead to incidence of transitional diseases (Sethy *et al.*, 2019). Transitional diseases are those diseases which may occur during the transitional period (period between three weeks before parturition and three weeks after parturition) leading to various financial losses to the dairy farmers. Various transitional diseases of economic importance are: dystocia, ROP, mastitis, metritis, anoestrus, repeat breeding, milk fever etc. (Thakur *et al.*, 2019). Occurrence of one transition disease may predispose to another disease in animals (Santos *et al.*, 2003).

The nutritional status of dairy cattle has a significant influence on many of the production diseases that result in financial losses to the dairy farmers. Nutrition and management during the transition period is very important, but its success is set several months earlier. High Dietary Cation and Anion Difference (DCAD), low magnesium, calcium levels in the diet, negative energy balance, low protein, vitamins and minerals are major factors contributing to transitional diseases (Oetzel *et al.* 1991 and Sakha *et al.*, 2014). Since farmers have poor knowledge about transitional period and transitional diseases; so appropriate strategies should be formulated in order to implement a structured transition cow programme (Thakur, 2018) to minimise post calving disorders, maximize dry matter intake, increase milk production, minimize degree and extent of negative

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nutrient balance, improve Calcium homeostasis, and minimize severity of negative energy balance and also the other factors triggering one transitional disease on the other. Therefore, extension efforts need to be taken for successful implementing the transitional programme for the benefit of farmers.

MATERIALS AND METHODS

For assessing the predisposition of one transitional disease to another, a two-year study was conducted and a total of 250 dairy farmers were selected randomly from all parts of Punjab (mainly from Barnala, Ferozepur, Hoshiarpur, Muktsar, Tarn Taran, Patiala, Sangroor, Faridkot, Gurdaspur

and Ludhiana districts). They were subjected to pre-testing through pilot survey from non-sampling area (Ropar District). The pre testing was done on 40 dairy farmers. Statements or items in an interview schedule were compiled through latest relevant literature, discussion with field extension personnel, subject matter specialists and academicians. The statement selected initially encompassed major areas of transitional period management according to the knowledge level and understanding of the dairy farmers. Very easy, very difficult and confusing items were eliminated from the final interview schedule. The pre tested final structured interview schedule was used as a tool to study the factors triggering incidence of one transitional disease on the other among the dairy animals of their farms. The data was tabulated and put to suitable statistical analysis with the help of SAS 9.3 system.

RESULTS AND DISCUSSION

Incidence of dystocia, retention of placenta and mastitis with other transitional diseases

The occurrence of dystocia was found to be significant ($p < 0.05$) with milk fever and ketosis. Whereas, the incidence of retention of placenta and metritis was found to be highly significant ($p < 0.01$) with dystocia (Table 1). The occurrence of retained placenta and metritis had more chances of occurrence in relation to dystocia because a week during or after parturition has abundance of bacteria such as *E. coli* and *Arcanobacterium pyogenes* (Giuliodori *et al.*, 2013) which affects the incidence of these diseases and also further mastitis. Milk fever and ketosis may occur as a predisposing factor of stress caused to the animal during this crucial period (Thakur, 2018).

As given in Table 1, retention of placenta varied significantly ($p < 0.01$) with dystocia, mastitis and anoestrous. Moreover, milk fever and ketosis were also found to be significant ($p < 0.05$) with the retention of placenta. Metritis had a highly significant variation with incidence of retained placenta ($p < 0.01$). Retention of placenta, mastitis and metritis occurs in relation to contamination due to bacterial pathogens whereas, various adverse effects on reproduction such as anoestrous or production such as milk fever and ketosis occurs in relation to the stress caused to the animal during this crucial period. Maizon *et al.* (2004) in their study reported that retained foetal membranes delay uterine involution predisposing cows to metritis and further decreased fertility. Also, nutrition plays an important role in predisposing animals to other transitional diseases.

In the study, mastitis was found to be highly significant ($p < 0.01$) with occurrence of milk fever, metritis, retained placenta, anoestrous and repeat breeding, (Table 1). The occurrence of mastitis may lead to metritis and retained placenta because of manipulation and hygiene practices while handling the case and bacterial contamination during the occurrence. Mastitis may also occur due to dietary deficiencies which may further lead to anoestrous, milk fever and repeat breeding. Ceylan *et al.* (2003) revealed that greatest incidence of transitional diseases occurs with the rate of increase of daily milk yield. Thus high producing cows susceptible to disturbed homeostasis, suppressed immune system and further leading to other transitional diseases.

Incidence of anoestrous and milk fever with other transitional diseases

Table 1 indicates that the occurrence of anoestrous was highly significant ($p < 0.01$) with milk fever, ROP, mastitis, ketosis and metritis. While repeat breeding varied significantly ($p < 0.05$) with anoestrous. Occurrence of milk fever, metritis, repeat breeding and ketosis may be due to dietary deficiencies particularly imbalanced DCAD or insufficient requirement of minerals to the animals (Van Dijk and Lourens, 2001). Whereas, retained placenta, mastitis and metritis may occur due to lack of management practices during the transitional period. Hundal *et al.* (2016) in their study revealed that majority of feed and fodder are deficit in major minerals which further lead to decreased productive potential, reduced immunity, repeat breeding, infertility and further reproductive disorders; predisposing to transitional diseases.

Table 1 depicts mastitis, ketosis, metritis and anoestrous varied significantly ($p < 0.01$), whereas, retention of placenta and dystocia also highlighted significant ($p < 0.05$) variation with the occurrence of milk fever. Milk fever may lead to dystocia because of the imbalance of calcium and further DCAD leading to contraction in the muscles of animals. Also, milk fever can cause retained placenta because of the deficiency of the minerals particularly Vitamin E and Selenium. The imbalance in DCAD causes negative energy balance to the animal which helps in the occurrence of Ketosis. Sharma (2003) stated that cows infected with milk fever were more prone to clinical mastitis. Houe *et al.* (2001) also indicated hypocalcaemia to be a key risk factor for reproductive disorders like dystocia, retained placenta and metritis.



Table 1: Incidence of different diseases with other transitional diseases (Significant correlation coefficient), n=250

Diseases	ROP	Mastitis	Milk fever	Ketosis	Metritis	Dystocia	Anoestrous	Repeat breeding
Dystocia	0.23**	0.12*	0.12*	0.13*	0.27**	-	-	-
ROP	-	0.22**	0.13*	0.13*	0.21**	0.23**	0.24**	-
Mastitis	0.22**	-	0.29**	-	0.29**	0.12*	0.23**	0.33**
Anoestrous	0.24**	0.23**	0.26**	0.16**	0.34**	-	-	0.14*
Milk fever	0.13*	0.29**	-	0.25**	0.21**	0.12*	0.26	-
Ketosis	0.13*	-	-	-	-	0.13*	0.16**	-
Metritis	-	0.29**	0.16**	-	-	0.27**	0.34**	0.15*
Repeat breeding	-	0.33**	-	-	0.15*	-	0.14*	-

*= Significant at 5%, **=Significant at 1%

Incidence of ketosis, metritis and repeat breeding with other transitional diseases

Table 1 also illustrates that the incidence of ketosis was highly significant ($p < 0.01$) with anoestrous and was significant with dystocia and retained placenta ($p < 0.05$). Ketosis may lead to anoestrous because of the imbalance in DCAD and dietary minerals (Bisinotto *et al.*, 2012). Whereas, retained placenta and dystocia might have occurred due to transitional stress to the animals. Moyes *et al.* (2009) stated that negative energy balance in early postpartum period induces significant metabolic changes which further have a negative impact on reproductive efficiency and also reduced immune response.

Also, Metritis was highly significant ($p < 0.01$) with diseases like dystocia, mastitis, anoestrous and milk fever, while repeat breeding also showed significant ($p < 0.05$) impact on metritis (Table 1). Metritis is a sequel of dystocia which may occur due to secondary bacterial infections or due to manipulation while handling a clinical case (Dohmen *et al.*, 2000). Metritis further affects reproductive potential further leading to anoestrous and repeat breeding (Kumari *et al.*, 2016).

Repeat breeding was highly significant with mastitis ($p < 0.01$). Whereas, anoestrous and metritis varied significantly ($p < 0.05$) with repeat breeding. Repeat breeders may lead to anoestrous because the dietary requirements of animals are not met. Also, repeat breeding occurs because of improper and unhygienic insemination techniques which may further lead to mastitis. These findings were in line with Tewari *et al.* (2010) who stated that interaction between nutrition, production and reproduction needs particular attention as it may lead to various transitional diseases.

CONCLUSIONS

Dairy animal management during transitional period is crucial for post calving health and productivity of dairy animals. Dairy farmers should be made aware of transitional

diseases, various factors predisposing one transitional disease on other and economic loss caused due to transitional disease in dairy farming. Therefore, the farmers need to be supported with appropriate extension and advisory service to overcome knowledge and skill-gap in transitional disease management with an emphasis on factors triggering one transitional disease on the other. As a way forward, training encompassing dairy animal reproductive management must include transitional disease management for disseminating the needy information among the farmers.

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