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Retrospective Study of Dystocia in Dairy Cows in Saesietsaeda-Emba District, Eastern Tigray, Ethiopia

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Abstract

A retrospective study was conducted from November, 2016 to April, 2017 in Saesie Tsaeda-Emba District, Eastern Tigray, Ethiopia with objectives of prevalence of dystocia occurrence and its associated risk factors in Saesie Tsaeda-Emba District. In the present study, 60 dairy cows were examined for determining of dystocia. Out of the 60 dairy cows examined, 38(63.3%) dairy cows were found to have dystocia. Out of the 38 dairy cows found problems with dystocia, 4(10.5%) were local, 23(60.5%) were cross and 11(28.9%) were exotic breed of cows. This result showed dystocia was higher in cross breed of cows when compared with local and exotic breed of dairy cows. 8(21%) of the dairy cows with dystocia were in natural mated, 28(73.7%) were in artificial inseminated and the rest 2(5.3%) were in both natural mated and artificial inseminated. This result indicated dystocia was higher in dairy cows with artificial inseminated 28(73.7%) when compared to natural mated 8(21%). 30(78.9%) of the dairy cows with dystocia were in first calving and 8(21%) were in second calving. This result revealed dystocia was higher in dairy cows with first calving. 20(52.6%) of the dairy cows found to have dystocia were delivered male claves whereas 18(47.4%) were female calves. This result showed dystocia with male calves were higher when compared dystocia with female claves. 9(15%) of the dystocia were caused by fetal, 16(26.7%) of the dystocia were caused by maternal, 13(21.7%) were caused by others and 22(36.7%) were unknown their causes. This result revealed dystocia was more caused by maternal problems when compared to fetal and other problems. Awareness creation to farm owners, attendants and improved management such as, proper feeding, accurate heat detection, considering the size of sir and dam while using artificial insemination, and health management should be improved to minimize the occurrence of dystocia and associated economic losses in the dairy farms of the area.

Keywords: Dairy Cows; Dystocia; SaesieTsaeda-Emba District; Retrospective

Abbreviations

%	:	Percentage
ºC	:	Degree Centigrade

Introduction

Dystocia is defined as difficulty or prolongation of parturition as opposed to normal parturition. Refers to the abnormal labor or calf that can be categorized as fetal, maternal and placental dystocia (Miller keane., 2003). Incomplete cervical dilation occurs very occasionally in heifers but the true incidence is difficult to determine because in most situations the onset of first stage labour has not been noted. It is probable that some dystocia cases are classified as incomplete cervical dilation but merely represent over-zealous interference during early first stage labor. (NADIS., 2016).

Different factors are responsible for dystocia occurrence in cattle. The most common type .re. Uterine inertia, where the cervix is fully dilated but uterine contractions are too weak to expel the fetus. Incomplete dilatation of the vulva is more common in heifers while incomplete dilatation of the cervix is more common in older cows. These conditions are associated with confinement and per parturient environmental stress, premature assistance, hormonal asynchrony and preterm calving (Mee., 2008)

Dystocia management must begin with proper heifer development. Fetopelvic disproportion is a major contributing cause of dystocia. Replacement heifers by measurement of the pelvic area of the dam to predict dystocia is sometimes used as a criterion for selection of replacement heifers. Combination of culling heifers with small pelvic areas and using bulls that sire calves with small birth weights may reduce dystocia significantly (Jonathan Statham et al., 2015). Description of behavioral signs of the cow or heifer before and during labor; when and how it is appropriate to assist the cow or heifer; Strategies to correct abnormal presentation, position, or posture; Hygiene practices during assisted births; Accurate record-keeping of birth events; Best communication practices within the farm team (i.e., when to call for help); and Best newborn care practices (e.g., timing and amount of colostrum's to be fed) were among dystocia management practices to be considered(Schuenemann et al., 2015).

In Saesie Tsaeda-Emba District small holder dairy farmers are not much perceived up on the development and management of dystocia even though dystocia is very common reproductive threat of small holder dairy farmers. Therefore, the objective of this study is to determine the prevalence of dystocia occurrence and its associated risk factors in Saesie Tsaeda-Emba District, Eastern Tigray, Ethiopia.

Materials and Methods

Study Area

The study was conducted in Saesie Tsaeda-Emba District, Eastern Tigray. The district is located at a distance of 83 km north from Mekelle, capital city of Tigray Regional State of Ethiopia. Te district is bordered by Districts namely: Ganta-Afeshum (north), Kilte-Awlaehlo (South), Atsbi-Wenberta and afar region (east) and Hawzen (west) (Saesie Tsaeda-Emba District, Bureau of Agriculture, and Rural Development, 2015). It has an altitude of 1305'27" N and longitude of 39029'25" E. it lies in semi-arid "Wainadega" at altitude of 2204m above sea level. The average minimum and maximum temperature of the area vary between 22ºC-27ºC. The district receives a bimodal rain fall with an average annual precipitation being 450-500 mm. the short rainy season locally called "azmera" extended from March to May and the long rainy season locally called "Tsidia" extended from June to August. Saesie Tsaeda-Emba District has 28 Sub-Districts (two urban and 26 rural). It has a total 164885 of human population (80794 males and 84091 Female), and livestock population of 80651 Cattle, 160,000 small ruminants and 12379 Equines (BoARD, 2014/15).

Study Animal

Animal's including in this study was cattle including local and cross breeds of urban, per urban and extensive management system that got veterinary service.

Study Design

Across-sectional descriptive study design will be followed to determine the epidemiology and management of dairy cattle under different management system based on the past veterinary clinic records and questionnaire survey of small holder dairy farmers purposively based on knowhow and experiencing veterinary service delivery.

Sample Size

The study involves districts, individual dairy cattle as a sampling unit. The districts will select purposively based on their representation of having veterinary service; the sample size for the study is determined based on expected prevalence rate of the disease 50% and absolute desired precision of 5 % at confidence level of 95 %.

The sample size is calculated according to the following formula (Thursfield, 2005).

$$n = \frac{1.962 Pexp\ (1-Pexp)}{d2}$$

Where:

n= required sample size,

Pexp = expected prevalence

d= desired absolute precision

Accordingly, 384 samples will be taken doubled to increase its accuracy of the study based on the records found on veterinary clinics.

Questionnaire Survey and Epidemiological Data Collection

The investigation process involves occurrence of dystocia, seasonal occurrence of the disease, presence of affected or dead animals and productivity loss. Relevant data will be gathered by interviewing around 60 livestock owners and animal health workers and information will be carefully recorded on a designed format which is annexed at the end of this page.

Results

Potential Risk Factors

In the present study, 60 dairy cows were examined for determining of dystocia. Out of the 60 dairy cows examined, 38(63.3%)

dairy cows were found to have dystocia. Out of the 38 dairy cows found problems with dystocia, 4(10.5%) were local, 23(60.5%) were cross and 11(28.9%) were exotic breed of cows. This result showed dystocia was higher in cross breed of cows when compared with local and exotic breed of dairy cows (Table 1).

8(21%) of the dairy cows with dystocia were in natural mated, 28(73.7%) were in artificial inseminated and the rest 2 (5.3%) were in both natural mated and artificial inseminated. This result indicated dystocia was higher in dairy cows with artificial inseminated 28(73.7%) when compared to natural mated 8 (21%) (Table 1).

30 (78.9%) of the dairy cows with dystocia were in first calving and 8 (21%) were in second calving. This result revealed dystocia was higher in dairy cows with first calving (Table 1).

Risk factors		No	Yes
Breed	Local Cross exotic	6(27.3%) 11(50%) 5(22.7%)	4(10.5) 23(60.5) 11(28.9%)
Breeding method	Natural mating Artificial insemi-nated both	18(81.8) 3(13.6%) 1(4.5%)	8(21%) 28(73.7%) 2(5.3%)
Parity	First calving Second calving	5(22.7%) 17(77.3%)	30(78.9%) 8(21%)

Table 1: Dystocia association with potential risk factors.

20(52.6%) of the dairy cows found to have dystocia were delivered male claves whereas 18(47.4%) were female calves. This result showed dystocia with male calves were higher when compared dystocia with female claves (Table 2).

11(28.9%) dystocia of dairy cows occurred in winter, 16(42.1%) dystocia of dairy cows occurred in summer, 4(10.5%) were occurred in autumn and 7(18.4%) were occurred in spring. This result indicated dystocia was higher in summer seasons followed by winter seasons when compared to autumn and spring seasons (Table 2).

11(18.3%) of the dystocia was handled with mutation, 25(41.7%) of the dystocia was handled with traction, 2(3.3%)of the dystocia was handled with fetotomy and 22936.7%) were unknown its handling of the dystocia (Table 2).

Risk factors		No	Yes
Sex of the calf	Male Female	3(13.6%) 19(86.4%)	20(52.6%) 18(47.4%)
Seasons	Winter Summer Autumn Spring	6(27.3%) 7(31.8%) 4(18.2%) 5(22.7%)	11(28.9%) 16(42.1) 4(10.5%) 7(18.4%)
Handling	Mutation Traction Fetotomy Not known	0(0%) 0(0%) 0(0%) 0(0%)	11(18.3%) 25(41.7%) 2(3.3%) 22(36.7%)

Table 2: Dystocia association with potential risk factors.

15(39.5%) of the dairy cows with dystocia were in extensive farming system and 23(60.5%) dairy cows with dystocia were in semi-intensive farming system. This result indicated dystocia was higher in semi intensive farming system when compared with extensive farming system (Table 3).

9(15%) of the dystocia were caused by fetal, 16(26.7%) of the dystocia were caused by maternal, 13(21.7%) were caused by others and 22(36.7%) were unknown their causes. This result revealed dystocia was more caused by maternal problems when compared to fetal and other problems (Table 3).

Risk factors		No	Yes
Farming system	Extensive Semi-intensive	6(27.3%) 16(72.7%)	15(39.5%) 23(60.5%)
Causes of dystocia	Fetal Maternal Others unknown	0(0%) 0(0%) 0(0%) 0(0%)	9(15%) 16(26.7%) 13(21.7%) 22(36.7%)
Number of animals	1-3 4-6 Greater than 6	10(45.5%) 8(36.4%) 4(18.2%)	5(13.2%) 19(50%) 14(36.8%)

Table 3: Dystocia association with potential risk factors.

Discussion

In the present study, out of the 60 dairy cows examined, 38(63.3%) dairy cows were found to have problem with dystocia. Out of the 38 dairy cows having dystocia, 4(10.5%) were local, 23(60.5%) were cross and 11(28.9%) were exotic breed of cows. In this study 8(21%) of the dairy cows with dystocia were in natural mated, 28(73.7%) were in artificial inseminated and the rest 2(5.3%) were in both natural mated and artificial inseminated. In this study also 30(78.9%) of the dairy cows with dystocia were in first calving and 8(21%) were in second calving.

In the present study the prevalence of dystocia was found to be 38 (63.3%) which was higher when compared with the findings of Mamo T (2004) who reported 5.79% in small holder dairy cows in and around Debre Zeiet, Dawit and Ahmed (2013) who reported 7.75 %, Gashaw et al. (2011) who reported 3.8% and Hadush et al. (2013) who reported 2.9% [1-4]. This variation in the occurrence of dystocia may be due to the fact that it is influenced by the factors such as, age and parity of the dam as well as breed of the sire. Inseminating cows with semen collected from large sized bulls without taking into account the size and age of cows is an important factor in precipitating dystocia [5].

In this study the higher prevalence 23(60.5%) of dystocia was found in cross breed of cows when compared with the findings of Temesge and Tegegn (2015) who reported 6.7% prevalence of dystocia among cross breed of cows; Sekhar and Rajani (2014) who reported 2.9% prevalence of dystocia among cross breed cows of Chittoor district of Andhra Pradesh [6,7]. This difference in prevalence of dystocia might be due to difference in management and hygienic practices.

In this study high incidence of dystocia was observed with male calves which might be attributed to their higher birth weight [8]. The Higher occurrence of dystocia in summer season followed by winter seasons than autumn and spring seasons in the present study may be attributed to higher number of calving occurring in these seasons.

The prevalence of dystocia (63.3%) found in the present study was relatively in agreement with findings of Megahed (2016) who reported 58.26%. The fetal causes of dystocia found in this study were found to be 9(15%). This finding is relatively lower when compared to the findings of Megahed (2016) who reported 60.97 % of the dystocia was resulted due to fetal causes. The maternal causes of dystocia found in this study were found to be 16 (26.7%). This finding is relatively lower when compared to the findings of Megahed (2016) who reported 39.04% of the dystocia was occurred because of the maternal causes.

In this study, higher prevalence of dystocia was observed in dairy cows with first parity number 30(78.9%) whereas 8(21%) of dystocia was observed in dairy cows with second parity numbers. This finding is disagree with the findings of Megahed (2016) who reported higher prevalence of dystocia in dairy cows with second parity numbers (44.57%) than dairy cows with first parity number (24.31%).

Higher prevalence of dystocia in the present study was observed in semi-intensive of farming system 23(60.5%) when compared to extensive of farming system 15(39.5%). This finding is in agreement with the findings of Molalegne and Shiv (2011) who reported higher prevalence of dystocia at semi intensive of farming system 18(38.3%) when compared to extensive of farming system 62(24.4%) [9].

Conclusion and Recommendations

This result showed a high prevalence of dystocia in dairy cows was observed in Edagahamus district. In this study high prevalence of dystocia was observed in cross breed of dairy cows when compare to local and exotic breeds. In this study, higher prevalence of dystocia was observed in dairy cows with first parity number when compared to dairy cows with second parity numbers. In this study high incidence of dystocia was observed with male calves which might be attributed to their higher birth weight. The Higher occurrence of dystocia in summer season followed by winter seasons than autumn and spring seasons in the present study may be attributed to higher number of calving occurring in these seasons. The maternal causes of dystocia found in this study were higher than the fetal and other causes. This result also showed higher prevalence of dystocia was observed in semi intensive farming system than extensive farming system.

Based on the above conclusion the following points were recommended:

- Awareness creation to farm owners, attendants and improved management such as, proper feeding, accurate heat detection, considering the size of sir and dam while using artificial insemination, and health management should be improved to minimize the occurrence of dystocia and associated economic losses in the dairy farms of the area.
- High prevalence of such problem requires further study to identify the most causes to design control strategy and community awareness on its early control and prevention activities in the study area.

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