Ovozoa 13 No. 3, December 2024 p-ISSN 2302-6464 e-ISSN 2722-967X
Available at https://e-journal.unair.ac.id/OVZ/index

Original article

Incidence and management of dystocia of dairy cows in Manoharganj upazila of Cumilla district, Bangladesh

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Open access under CC BY – SA license, DOI: 10.20473/ovz.v13i3.2024.178-185
Received September 28 2024, Revised December 10 2024, Accepted December 11 2024
Published online December 2024

ABSTRACT

Every year, thousands of cows and calves die during parturition for poor parturition managements, and insufficient veterinary services. A total of 83 cases of dystocia were the subject of a retrospective investigation between January 2021 and December 2023 to determine the incidence of dystocia in dairy cows in Manoharganj upazila of Cumilla district, Bangladesh. The study revealed that local breed cows had a higher prevalence of dystocia (53.01%) than cross-breed cows (46.99%). Also, younger cows had a higher incidence of dystocia (71.08%) than older cows. Primiparous heifers showed a higher incidence of dystocia (69.88%) than pluriparous cows (30.12%). In addition, compared with naturally inseminated cows (9.64%), artificially inseminated dairy cows had a higher dystocia rate (90.36%). The occurrence of dystocia was found to occur more frequently in fetal causes (65.06%) than in maternal causes (34.94%). Among maternal causes, incomplete cervix dilation was the most common (18.07%), while fetal head deviation was the most frequent fetal cause (27.71%). Fetal oversize, carpal flexion, shoulder flexion, fetal dropsy, twin calves, uterine torsion, and uterine inertia were other low-incidence causes of dystocia. The most common method of managing dystocia was manual correction (91.57%), followed by fetotomy (4.82%), and C-section (3.61%). After dystocia treatment, 96.25% of dams survived, and 3.75% of cases resulted in dam deaths; fetal death occurred in 32.5% of cases, while the fetal survival rate was 67.5%. Therefore, this study suggest that when using artificial insemination, it is best to consider the breed of the dam and sire.

Keywords: C-section, dystocia, fetotomy, maternal cause, Manoharganj, Bangladesh

INTRODUCTION

Dystocia, or difficult calving, is a significant issue in dairy cow management worldwide, including Bangladesh. It refers to a cow's inability to calve without assistance, posing risks to both the cow and the calf. Moreover, dystocia was defined as a delayed or difficult calving process that often requires significant human intervention (Lombard *et al.*, 2007; Zaborski *et al.*, 2009; Uzamy *et al.*, 2010), impacting both production and future reproduction. In Bangladesh, where dairy farming is crucial to the agricultural economy, effective management of dystocia is essential for ensuring the health and productivity of dairy herds. However, traditional animal husbandry practices are more prevalent in the study areas, where the incidence of dystocia varies across dairy farms in Bangladesh but is consistently reported as a common problem.

How to cite this article: Al Wasef A, Islam MR. 2024. Incidence and management of dystocia of dairy cows in Manoharganj upazila of Cumilla district, Bangladesh. Ovozoa: Journal of Animal Reproduction. 13: 178-185.

Recent data indicated that dystocia was one of major obstetrical concern in dairy cows (Juneja *et al.*, 2023). Among all domestic animals, the incidence of dystocia was notably higher in cattle and buffalo compared to other farm animals (Purohit *et al.*, 2011). The incidence was reported to range between 2-22% while assisted calving occurred in 10 to 50% of cases (Mee, 2008). In cattle, the incidence was higher in dairy cows than in beef cattle (Weldeyohanes and Fesseha, 2020). Dystocia is classified into maternal and fetal type (Sloss and Dufty, 1980). Among them, fetal dystocia incidence was higher in cows (Singla *et al.*, 1990; Nanda *et al.*, 2003), while maternal dystocia was more common in buffaloes (Singla *et al.*, 1990; Phogat *et al.*, 1992; Singla and Sharma, 1992). Maternal dystocia could be caused by deficiency of expulsive forces, narrow pelvic structure, incomplete cervical dilation, and uterine torsion (Linde-Forsberg and Eneroth, 2000). On the other hand, fetal dystocia manifested as head deviation, forelimb flexion, carpal flexion, breech presentation, fetal malformations, and dog sitting position (Bhattacharyya *et al.*, 2012; Bhattacharyya *et al.*, 2015).

Various predisposing factors contributed to dystocia, including breed, parity, calf sex, birth weight, pelvic size, gestation length, nutrition, year, and timing of parturition (Mee, 2008), as well as teratology such as schistosomus reflexus (Lestari *et al.*, 2019). The economic impact of dystocia was substantial, affecting producers through calf morbidity and mortality (Mekonnen and Moges, 2016; Abera *et al.*, 2017), increased veterinary costs, potential dam injury or mortality (Bicalho *et al.*, 2008), reduced fertility (Purohit *et al.*, 2012), decreased production (McGuirk *et al.*, 2007), and welfare concerns for both dam and offspring. Dystocia also increased the risk of sterility, puerperal disease, and subsequent culling of the dam (Frame, 2006; Abera, 2017; Noakes *et al.*, 2018). Production losses were most significant in high yielding cows and during early lactation (Lombard *et al.*, 2003).

However, the incidence of dystocia in cattle has been extensively studied due to its impacts on productivity and substantial financial losses. While it may not be possible to completely eliminate dystocia, careful management of heifers during their development and close monitoring of cows and heifers during the calving season can help reduce its occurrence. Therefore, this study was conducted to determine the incidence of dystocia and identify the specific risk factors including breed characteristics and management practices, contributing to dystocia incidence in Manoharganj upazila of Cumilla district of Bangladesh.

MATERIALS AND METHODS

Study areas and period

The retrospective or prospective observational study was conducted on cattle (n= 83) presenting with dystocia at the Upazila Livestock Office and Veterinary Hospital in Manohorganj Upazila of Cumilla district, Bangladesh, from January 2021 to December 2023. The cases were handled, and data were recorded from various locations within Manoharganj upazila during the specified period.

Record of owner's complain/History

Owners informed over phone or using social apps, or directly came to the hospital, and their cows exhibited signs of excessive restlessness, severe straining, arched back, appearance of water bag/rupture of water bag, and the emergence of one or both feet etc. Following these reports, we recorded the demographic information, including farm location, herd size, breed composition, management practices, and previous reproductive history.

Diagnosis and management of dystocia

Eighty three (83) dairy cows with dystocia were the subjects of the study. Diagnoses were made based on the transvaginal examination, physical examination, and case histories. After identifying the fetal, maternal, or both causes of dystocia, the appropriate procedures (manual traction, episiotomy, fetotomy, C-section,

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Schaffer's method) were administered. In cases where the fetus's aberrant presentation, position, and posture were corrected manually or with instruments such as obstetrical ropes and chains with lubricated with obstetrical cream (Hexitane obstetric cream), force extraction was used. The fetotome device was used in certain instances to perform partial fetotomy (Jackson, 1980). For cases of dystocia that could not be corrected, cesarean sections were performed as best method for delivering the fetus. Cesarean sections were carried out using a set of surgical instruments, the left flank approach, and local infiltration anesthesia with 2% lignocaine (Verma *et al.*, 1974). Additionally, for cases of uterine torsion, modified Schaffer's method was utilized to correct torsion effectively (Arthur, 1966).

Data collection

A total of 83 dystocia cases were recorded, documenting calving events such as the date of calving, parity of the cow, gestational age, presentation of the calf, duration of labor, assistance required, and outcomes for both cow and calf. Additionally, we noted the nutrition management, breeding practices, access to veterinary services, and protocols for dystocia management.

Statistical analysis

The data collected from the questionnaire were entered into Microsoft Excel 2016, then organized, analyzed, and compared using percentages with the statistical software MINITAB.

RESULTS

In this study, 83 dairy cow cases with dystocia were examined; the dystocia cases in the local breed (53.01%) were more prevalent than the cross breed (46.99%). Compared to older cows (aged ≥5 years), younger cows (aged 2.5-5 years) showed a higher prevalence of dystocia (71.08%). Regarding parity, the proportion of dystocia cases was highest in primiparous heifers (69.88%), followed by pluriparous cows (30.12%). Moreover, dystocia was much more common in artificially inseminated cows (90.36%) than in naturally inseminated cows (9.64%) (Table 1).

According to this study, among cows, fetal causes (65.06%) were more common than maternal causes (34.94%). The maternal causes (Figure 1A) that accounted for 18.07% of cases were incomplete cervical dilatation, followed by uterine torsion at 3.62% and uterine inertia at 13.25%.

Table 1 Percentage of dystocia based on breed, age, parity, and service (n=83)

	incidence (%)
breed	
local	53.01
cross breed	46.99
age	
2.5-5.0 years	71.08
≥ 5.0 years	28.92
parity	
primiparous	69.88
pluriparous	30.12
service	
natural	9.64
artificial	90.36

Table 2 Causes of dystocia in cattle (n=83)

causes	incidence (%)	
Maternal causes		
uterine torsion	3.62	
incomplete cervical dilation	18.07	
uterine inertia	13.25	
total		34.94
Fetal causes		
fetal oversize	3.61	
deviation of head	27.71	
breech presentation	6.02	
carpal flexon	13.25	
shoulder flexon	8.43	
dog sitting position	1.21	
hydroperitoneum fetus	1.21	
hydrocephalus fetus	2.41	
twin calf	1.21	
total		65.06

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Table 3 Correction method and frequency of dystocia (n=83)

methods of correction	incidence (%)
manual	91.57
caesarian section	3.61
fetotomy	4.82

Conversely, with respect to fetal causes (Figure 1B), the most frequent abnormal presentations were breech presentation (6.02%), carpal flexion (13.25%), deviation of the fetal head (27.71%), and shoulder flexion (8.43%). Fetal oversize (3.61%), dog sitting position (1.21%), hydroperitoneum fetus (1.21%), hydrocephalus fetus (2.41%) (Figure 1F), and twin calf (1.21%) were among the other less frequent fetal causes. In this study, the most common fetal cause of dystocia was deviation of the fetal head (27.71%), while the most common maternal cause was incomplete dilation of cervix (18.07%) (Table 2). The majority of the dystocia cases (91.57%) that were examined were treated by manual correction; these were followed by fetotomy (4.82%) and C-section (3.61%) (Table 3). The situation following dystocia management, in which 96.25% of dams survived overall and 3.75% of cases resulted in dam deaths despite intervention. Fetal death occurred in 32.5% of cases, while the rate of fetal survival was 67.5% (Table 4).

Table 4 Dam and fetal condition after dystocia management (n=83)

	live	incidence (%)	death	incidence (%)
dam	79	96.25	4	3.75
fetus	55	67.50	28	32.50

Figure 1 Causes of dystocia in cows, and the treatments; A: maternal causes of dystocia; B: fetal causes of dystocia; C: manual correction of dystocia; D: surgical (caesarian) correction of dystocia; E: surgical (fetotomy) correction of dystocia; F: hydrocephalus fetus.

DISCUSSION

Difficult calving, or dystocia, is a major problem in dairy farming around the world. It's critical to comprehend local incidence rates and management techniques in Bangladesh. In the current studies, 12 to 15 hours after the start of the second stage of labor, all cows with dystocia

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were registered in the Upazila Livestock Hospital. In this study, breed, age, parity, and service methods were the main factors of dystocia. The incidence rate of dystocia was higher in primiparous dams (69.88%) than pluriparous (30.12%) cows among these factors. In Italy, primiparous dams had a higher incidence of dystocia (De Amicis *et al.*, 2018). Other research, however, demonstrated that parity was the most important maternal factor affecting calving performance, with dystocia occurring two to four times more often in heifers than in older cows (Purohit *et al.*, 2011, 2012). Local cows had a higher incidence of dystocia (53.01%) compared to the cross-breed cows (46.99%). Smallholder farmers in Bangladesh are increasingly engaging in cross-breeding between native and Holstein-Friesian/Shahiwal breeds in an effort to boost productivity. According to similar research, farmers favored raising crossbred cows over native cows (Agustine *et al.*, 2019). On the other hand, using frozen semen from Holstein-Friesian/Shahiwal bulls to artificially inseminate local cows was expected to result in higher average daily weight gain in calves. However, this method was also more likely to lead to dystocia (90.36%), which is consistent with recent studies in Indonesia (Paputungan *et al.*, 2022). Age at first calving was linked to the occurrence of dystocia. Heifers that calved at a younger age had higher incidence of dystocia (Atashi *et al.*, 2021). In general, the age of cows was related to parity, the study showed the incidence rate of dystocia was higher (71.08%) in 2.5-5.0 years cow than ≥ 5 years cows (28.92%). This finding is consistent with the report by Febrianila *et al.* (2018), which stated that the incidence of dystocia was 30-60% for the first calving, 8-25% for the second, and 2-8% for the third or subsequent calvings. The increased risk of dystocia in young heifer was mainly due to fetomaternal disproportion, heifer's immaturity and incomplete physical development (Mee *et al.*, 2011). The incidence of dystocia in cows decreased significantly with age (Gaafar *et al.*, 2011; Khan *et al.*, 2015). It might be due to older cows were more experienced in calving, and their pelvic girdles gradually expand over time. The incidence of dystocia caused by fetal factors was higher (65.06%) compared to that caused by maternal factors (34.94%). When compared to other factors under investigation, incomplete cervix dilation (18.07%) was the highest maternal factor, while deviation of the head (27.71%) was the highest cause of fetal dystocia. This result aligns with the findings of De Amicis *et al.* (2018), which reported that in Italy, dystocia caused by fetal factors was more common than that caused by maternal factors.

Dystocia was more frequently caused by maternal factors than by fetal or other factors in the Saesie Tsaeda-Emba district in Eastern Tigray, Ethiopia (Yohannes *et al.*, 2018). Studies conducted on Iraqi cows revealed that 62.85% of dystocia cases were caused by fetal factors and 37.15% by maternal factors (Rahawy, 2019). Primary uterine inertia, incomplete cervical dilatation, uterine torsion, and narrow pelvis contributed to 22.9%, 20%, 14.3%, and 5.7% of dystocia due to maternal factors (Rahawy, 2019). Fetal maldisposition was responsible for 17.15% of dystocia cases related to fetal factors, while fetal monsters accounted for 11.42%, and fetal emphysema for 8.58% (Rahawy, 2019). Different types of fetal dystocia resulting from fetal maldisposition had been recorded in cattle. It was thought that these are occurred due to reduced viability of the fetus. When the fetus failed to rotate from its intrauterine position to the normal birth position, it could lead to dystocia (Reshma *et al.*, 2018).

The most common method in Bangladesh was the conservative approach of vaginal delivery through medication, manual assistance, or forced extraction; this was followed by fetotomy and cesarean section (Figure 1C, 1D, 1E). In general, alternative method such as fetotomy, controlled vaginal delivery (CVD), or C-section should be considered if there was no improvement after 15 minutes of obstetric manipulation (Jackson, 2004; Frame, 2006; Abera, 2017). Manual correction (91.57%) dystocia in cows was relieved by fetotomy (4.82%), and caesarean section (3.61%). Additionally, following the management of cows

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with dystocia, the conditions of the dam and the fetus was documented. According to our data, 67.50% of the fetus and 96.25% of the dam were alive that Kolkman *et al*., 2007 made comparable findings. Dams usually had a higher survival rate than fetuses, as cows could recover well from the stresses of labor. In contrast, fetuses were more prone to complications like oxygen deprivation, trauma, or malposition.

CONCLUSION

Dystocia and their associated losses could have a significant economic impact on cow-calf producers. Results from this study showed the different incidence factors of dystocia. Addressing the incidence factors of dystocia in dairy cows is essential for sustainable dairy farming in Bangladesh. By implementing effective management strategies and improving access to veterinary services and education, dairy farmers can mitigate the economic and health impacts of dystocia, ultimately enhancing the welfare of their herds and the profitability of their operations.

ACKNOWLEDGMENTS

The authors thank the Upazila livestock officer (ULO) and stuffs, Upazila livestock office and Veterinary Hospital, Manoharganj upazila of Cumilla district, Bangladesh, for providing necessary facilities and guidance during the course of study.

AUTHOR'S CONTRIBUTION

Al Wasef (AW), Md Rashedul Islam (MRI). Al Wasef: Conceptualization, methodology, data analysis and interpretation, writing main manuscript, Md Rashedul Islam: Data analysis, editing and reviewing manuscript. All authors read and approved the final manuscript.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest about this publication.

FUNDING INFORMATION

The study had no funds.

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