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Retrospective study of incidence and management of dystocia with postpartum reproductive performance in cross bred cows in Tirunelveli

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Abstract
Retrospective study was performed on incidence, management of dystocia and postpartum reproductive performance in 598 numbers of Cross bred cows. The incidence of dystocia was decreased with increasing live body weight and parity of cows (P<0.05). On the other hand it increased with increasing in birth weight calves (P<0.05) and the percentage of dystocia with male calf was significantly higher than that of female calf. Incidence of dystocia was higher in semi intensive farming system when compared with extensive farming system. Foetal causes of dystocia were higher than maternal causes of dystocia i.e. 37.8% and 62.2% respectively. Dystocia due to foetal maldisposition (30.26%) followed by uterine torsion (17.39%) and foetal oversize (17.05%) was the most common causes. 62.5% of dystocia were managed with mutation and traction followed by caesarean section (24.24%). Dystocia had adverse effect on postpartum reproductive performance in cows i.e. evidence of 1st estrus after obstetrical procedure was increased up to 44±28, 47±19 days and 61±23 days with mutation and traction followed by fetotomy and caesarean section respectively. The conception rate was significantly decreased and number of A.I. significantly increased in the animals managed with caesarean section followed by fetotomy and mutation methods.

Keywords: Dystocia, mutation and traction, fetotomy, caesarean section, incidence, reproductive performance

Introduction
Dystocia is defined as difficulty in birth that causes reduced calf viability, injury to maternal birth canal which requires assistance [1]. Incidence of dystocia in cattle is higher than other farm animals [4]. However, in cows the higher incidence of foetal cause of dystocia is than maternal causes [5]. Dystocia causes huge economic loss to the farmers in term of calf morbidity and mortality [2]. Obstetrical procedures causes increased veterinary expenses, decreased production [6] followed by reduced fertility [7], in some cases severe injury of birth canal or death of the dam [3]. The present study was designed to study the incidence of dystocia due different risk factors along with its management with different obstetrical procedures followed by their effect on reproductive performance in cross bred cows.

Materials and Methods
598 numbers cross bred cows were presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Tirunelveli with the history of difficulty in birth during January 2015 to December 2019 were taken for this study. After collection of history, clinical examination followed by pervaginal examination animals were classified into predisposing factors and causes of dystocia on the basis of live body weight of dam, parity of the dam, sex of the foetus, calf birth weight, farming system and maternal or foetal cause. Further cases were treated with different obstetrical procedures like manual correction using mutation and traction techniques, fetotomy and caesarean section. Most of the cases were managed by mutation and traction. Cases of uterine torsion were managed by Modified Schaffer's Method. Dead foetuses were relived either by mutation and traction or by fetotomy. Subsequently the cases in which pervaginal delivery was not possible, caesarean section was performed under local anaesthesia with 2% infiltration of Lignocaine on left flank oblique ventro lateral incision. The reproductive performance of the animals were analysed on the basis of appearance of postpartum estrus, number of services and conception rate.

Results

1. **Dam live body weight:** The present study revealed that incidence of dystocia was more common in the small cross bred animals weighing less than 200kg (31.6%) followed by dams weighing 200-300 kg and 300-400 kg i.e. 30.9% and 27.9% respectively. The incidence of dystocia in larger breeds more than 400 kg was low (9.5%) (Table 1.).
2. **Parity:** In the present study the incidence of dystocia was reduced with parity, primiparous animals had 39% of dystocia followed by 2nd, 3rd, 4th and parity which was 21.4%, 17.89%, 12.3%, and 9.03% respectively. In the animals more than five calvings the incidence of dystocia was only 6.35% (Table 1).
3. **Sex of the calf:** Calf sex was an influential factor in this study as the incidence of dystocia was higher in the animals carries male foetus (59.6%) than that of female calves (40.4%) (Table 1).
4. **Calf birth weight:** The present study revealed that the incidence of dystocia increased with the increase in the body weight of the calves as the dystocia with calves weighing less than 18 kg (17.2%) had minimum incidence on the other hand calf weight more than 31 kg (34.28%) (Table 1.) had maximum incidence of dystocia.
5. **Farming System:** The present study recorded that housing of animal and farming system had potent role in the occurrence of dystocia as the incidence of dystocia was higher in semi intensive farming system (60.53%) than that of extensive farming system (39.46%) (Table 1.).
6. **Cause of Dystocia:** It was found that dystocia due to foetal cause (62.2%) was higher than the maternal causes (37.8%). The incidence of dystocia due to foetal maldisposition was 30.26% followed by uterine torsion (17.39%) and foetal oversize (17.05%). Other significant cause of dystocia was foetal emphysema (9.86%), incomplete cervical dilatation of cervix (8.2%), narrow pelvis (7.50%), uterine inertia (4.34%), foetal monsters (1.84%) and foetal dropsical cases (3.18%) (Table 1.).
7. **Management of Dystocia:** In the present study 64.5% of dystocia were managed with mutation and traction, dead oversized and emphysemated foetuses were delivered per vaginaly with partial or complete fetotomy (Table 2.). The cases of uterine torsion were managed with modified Schaffer's method followed by mutation and gentle traction. The cases in which pervaginal delivery were not possible, emergency caesarean section was performed under local anaesthesia with 2% local infiltration of Lignocaine 2%. Caesarean section was performed on left flank oblique ventro lateral incision.
8. **Postpartum Reproductive Performance:** The occurrence of post-partum estrus was prolonged in the animals subjected to dystocia. The animals treated with mutation and traction had post-partum estrus after 44±28 days followed by fetotomy and caesarean section i.e. 47±19 days and 61±23 days respectively. The number of services (Natural mating and A.I.) was significantly higher and conception rate was significantly lower ($p<0.05$) in the animals in which caesarean section was performed 4.3 and 48.9% than that of fetotomy (3.9) and 58% and manual traction (3.4) and 62.6% respectively (Table 2.).

Discussion

Live body weight of dam is an important risk factor influencing the incidence of dystocia as the body confirmation of the dam increases the size of pelvis bone increase which provides enough room for the foetus in birth canal which can reduces the occurrence of dystocia in cows [8]. Our results are in agreement with Anderson [9] who reported negative correlation between dam body weight and the incidence of dystocia.

As the parity of the animal increases the incidence of dystocia reduces due to smaller size at first parturition in primiparous animals than at subsequent calvings in pleuriparous animals. Primiparae animals usually presented with dystocia due to foeto maternal disproportion [10]. Oslon *et al*. [11] reported that calf born from primiparous animal needs 2.5 times more than the calf delivered from a pleuriparous animal.

As per our study the incidence of dystocia with male foetus was significantly higher than female foetus and almost similar findings were recorded by Purohit and Mehta, [12] and Reshma *et al*. [13]. Heins *et al*. [14] reported due to the bigger size of the male foetus along with longer gestation causes higher incidence of dystocia than that of female calves.

As per Anderson [9] and Gaafar *et al*. [8] the body weight of the calf is positively correlated with the incidence of dystocia which is mainly due to foeto maternal disproportion, which is in accordance with the present study.

Higher prevalence of dystocia was recorded in the animals reared in semi intensive system than that of extensive system which might be due to confinement and limited movementwhich in turn can affects foetal development. This finding is in agreement with Molalegne and Shive [15]and Yohannes *et al*. [16].

In cattle, Singla *et al*. [5], Purohit and Mehta [12] had reported that foetal dystocia is more common than dystocia of maternal origin which in agreement with our study. Dystocia due to foetal maldisposition is the most common which is in accordance to Yohannes *et al*. [16], Reshma *et al*., [13], Wehrend *et al*., [17] and Holland *et al*. [18]. In this study among maternal causes uterine torsion had the highest incidence of dystocia which was also reported by Jeengar *et al*. [19] and Purohit and Mehta [12].

Our study reported that majority of dystocia in field related to foetal maldisposition, incomplete cervical dilatation, secondary uterine inertia conditions can be managed by mutation and traction with or without medical management which is in agreement with Reshma *et al*. [13]. Uterine torsion can be managed with modified Schaffer's method. Fetotomy was done in the cases with dead, emphysemated foetus or foetal dropsy and in which there is no or less space to do mutation. Caesarean section was performed in the conditions where pervaginal delivery was not at all possible like foetal monsters, Dicephalus twins, Arthrogryposis foetus in breech presentation, narrow pelvis with live foetus and foetal oversize. These managemental procedures were also reported by Nix *et al*. [20] and Reshma *et al*. [13] are in accordance with the present study.

The present study postpartum reproductive indices were recorded which reported that the occurrence of dystocia had an adverse effect on the appearance of first postpartum estus and calving interval. The conception rate also decreased adversely in the cases managed by caesarean section followed by fetotomy and mutation and traction. The number of services per conception also increased which further increases the calving interval. These results are in accordance with

Gaafar *et al*. [8]. Lopez de Maturana *et al*. [21] also reported that dystocia resulted in impaired fertility due to decrease in conception in first A.I.

Awareness creation to farm owners, improved management such as; proper feeding, considering the size of sire and dam while artificial insemination, natural mating and health management should be improved to decrease the incidence of dystocia which can reduces the economic and production losses in small scale dairy industry.

Table 1: Predisposing factors for Dystocia

S. No.	Factors	Number	Percentage (%)
1	**Dam live body weight**		
	<200 kg	189/598	31.6
	200-300 kg	185/598	30.9
	301 – 400kg	167/598	27.9
	>400 kg	57/598	9.5
2	**Parity**		
	1st caving	197/598	32.9
	2nd caving	128/598	21.4
	3rd caving	107/598	17.89
	4th caving	74/598	12.3
	5th caving	54/598	9.03
	>5 calvings	38/598	6.35
3	**Calf Sex**		
	Male calf	357/598	59.6
	Female calf	241/598	40.4
4	**Calf birth weight**		
	<18 kg	111/598	17.2
	18-25	179/598	18.5
	26-30	205/598	29.9
	>31	103/598	34.28
5	**Farming System**		
	Extensive farming	236/598	39.46
	Semi intensive farming	362/598	60.53
6	**Cause of Dystocia**		
a	**Maternal Causes**		
	Uterine torsion	104/598	17.39
	Incomplete cervical dilatation of cervix	51/598	8.52
	Narrow pelvis	45/598	7.52
	Uterine Inertia	26/598	4.34
	TOTAL	**226**/598	**37.8**
b	**Foetal Causes**		
	Foetal maldisposition	181/598	30.26
	Foetal emphysema	59/598	9.86
	Foetal oversize	102/598	17.05
	Foetal Monster	11/598	1.84
	Foetal dropsy	19/598	3.18
	TOTAL	**372**/598	62.2

Table 2: Management of Dystocia and Postpartum Reproductive Performance

S. No.	Obstetrical Procedures	No. of animals	1st Estrus after Obstetrical Procedure	No. of animals conceived	Conception rate	No. of A.I. per conception
1.	Mutation and Traction	386	44±28 days	242	62.6%	3.4
2.	Fetotomy	67	47±19 days	39	58%	3.9
3.	Caesarean Section	145	61±23 days	71	48.9%	4.3
	Chi-square Statistic			8.22*	* $p<0.05$	

Conclusion

This study concluded that the incidence of dystocia was higher in cows with less body weight and primiparous cows with male foetus or the foetus size more than 31 kg. The incidence was further higher in the animals reared in the semi intensive system. Foetal cause of dystocia i.e. foetal maldisposition is the major cause of dystocia followed by uterine torsion which is of maternal origin. Majority of the dystocia were managed by mutation and traction. The postpartum reproductive performance in the animals underwent dystocia were adversely affected in the term of late post-partum estrus, increased calving period, reduced conception rate and increase in the number of services per conception in the cases managed by caesarean section, fetotomy and mutation and traction respectively due to more damage to the birth canal and post-partum complications.

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