RESEARCH ARTICLE

Epidemiological Survey on Cervico-Vaginal Prolapse and its Associated Risk Factors in Buffaloes along with an Assessment of Farmers Knowledge

Manda Manasa[1]*, Kancharla Jyothi[1], Kalubandi Sai Gunaranjan[1], Pentyala Vidya Sagar[2]

Abstract

The present study was conducted to assess the prevalence, risk factors and farmers levels of understanding on cervico-vaginal prolapse (CVP) in buffaloes. The survey was conducted in 910 buffaloes involving 356 farmers of Proddatur region in YSR Kadapa district, Andhra Pradesh, India. The study revealed 10.44% (95/910) genital prolapse, which included CVP 6.92% (63/910) and uterine prolapse 3.52% (32/910). CVP was more prevalent in extensive system of rearing (16.66%), those fed with dry roughage and concentrates (17.07%), those animals that were kept on uneven flooring (12.82%). In the present study, buffaloes in their 7th parity (50.00%) and 9th month of gestation (31.74%) had more number of cervico-vaginal prolapse. Higher numbers of cases were recorded in winter than summer (57.14 vs 42.86%). Amongst 63 CVP affected buffaloes 42.86% experienced dystocia at the time of parturition, while 28.5% experienced occurrence of total uterine prolapse. Birth of male calves was predominant in the cases of CVP (58.73% vs 41.27%) as compared to femal calves. 30.2% of affected buffaloes each experienced RFM and metritis. A questionnarie was prepared to assess the knowledge of farmers on the etiological factors and prevention measures of the CVP and their responses were recorded. It could be concluded that training programs and *Kisan melas* must be held to enlighten the farmers about the cervico-vaginal prolapse and various reproductive disorders in buffaloes and their preventive measures in the area studied.

Key words: Buffalo, Cervico-vaginal Prolpase, Prevalence, Questionnarie, Preventive measures, Risk factors.

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Introduction

Livestock is the main source of occupation in the dry regions like YSR Kadapa district. Buffaloes, sheep and goats are the main livestock animals that are reared in the district. Farmers living in these areas earn their income by maintaining and rearing the livestock. Achieving the pregnancy in livestock mainly in buffaloes and cattle is utmost worthy for farmers, since the pregnant or lactating animal is the main source of income for them. Some of the obstetrical complications during the pregnancy are uterine torsion, fetal dropsy, genital prolapse etc are life threatening conditions. Many managemental conditions affect the incidence of prolapse. So, the objective of this surveillance was to know about the prevalence and factors effecting the occurrence of cervico-vaginal prolapse in buffaloes of YSR Kadapa district of Andhra Pradesh and also the awareness in farmers on the genital prolapse.

Materials and Methods

Sampling Plan and Sampling Size

This study was undertaken on an epidemiological examination of cervico-vaginal prolapse (CVP) in buffaloes in nearby villages of Proddatur region in YSR Kadapa district of Andhra Pradesh (India). Employing a qualitative research methodology, the investigation adopted a descriptive analytical approach to identify the key factors influencing the occurrence of this condition. The research encompassed a total of 14 villages, incorporating 356 farmers and 910 buffaloes within the study framework. Data collection was over an 8-month period, spanning from April 2024 to November 2024.

Tools of Data Collection and Observations

The data for this study were collected through interviews and questionnaires, which were developed based on a thorough

[1]Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science, Proddatur- 516360, Sri Venkateswara Veterinary University, Andhra Pradesh, India

[2]Department of Veterinary Surgery and Radiology, College of Veterinary Science, Proddatur-516360, Sri Venkateswara Veterinary University, Andhra Pradesh, India

Corresponding Author: Dr. M. Manasa, Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science, Proddatur-516360, SVVU, Andhra Pradesh, India e-mail: m21051999@gmail.com.

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review of relevant literature and objectives of the study guided the preparation of a questionnaire, which was created in an easy-to-understand manner for farmers. To evaluate farmers understanding of genital prolapse in buffaloes, a set of questions was prepared focusing on the etiological factors such as type of rearing (extensive, semi-intensive, intensive), type of feeding (green fodder, dry roughage, concentrate, mineral mixture), type of flooring (uneven, brick, sloppy), parity of the animals, stage of gestation (advanced stage of pregnancy), and season of occurrence (winter, summer) contributing to the onset of the condition and preventive measures. The questionnaire also gathered information on the after-effects of cervico-vaginal prolapse like dystocia during parturition, recurrence of total uterine prolapse, occurrence of retention of fetal membranes (RFM) and metritis, and calf details (viability, sex). The interviewed farmers were categorized into three groups based on the number of animals they possessed; small farmers with 1-4 buffaloes, medium farmers with 5-10 buffaloes, and large farmers with more than 10 buffaloes.

Statistical Analysis

The collected data was tabulated with the help of Microsoft Excel and analysed using chi-square (X^2) test using IBM SPSS version 20.0. The level of statistical significance was determined using the p-value for mean differences, if it was <0.05 and <0.01, considered statistically significant and highly significant, and that >0.05 was regarded as non-significant.

Results and Discussion

The present study recorded an overall incidence of genital prolapse at 10.44% (95/910) with cervico-vaginal prolapse occurring at 6.92% (63/910) and uterine prolapse at 3.52% (32/910).

Risk Factors Affecting the Occurrence of CVP

The findings highlighted several risk factors influencing occurrence of cervico-vaginal prolapse (CVP), and their relative significance (Table 1). The highest prevalence of CVP (16.16%) was seen in extensive rearing system followed by intensive (8.33% and semi-intensive (4.48%) system. Bhatti *et al.* (2006) found a prevalence of 14.07% CVP in semi-intensive management and 12.98% in intensive management. The high prevalence in extensive systems may be attributed to nutrient deficiencies, particularly during dry periods when grazing pastures lose nutritional value (Ndlovu *et al.,* 2007). In contrast, the higher incidence in intensive systems may be linked to muscle weakening and tissue integrity loss due to restricted animal movement (Purohit *et al.,* 2018).

The occurrence of CVP in buffaloes varied significantly depending on their diet, with the highest prevalence found in those fed dry roughage and concentrate (17.07%) followed by dry roughage alone (10.46%) and the least prevalence was seen in buffaloes those fed with green fodder and dry roughage (3.01%)(Table 1). This contrasts Alam *et al.* (2014), who reported higher reproductive diseases in cows fed greens and straw. The high CVP prevalence in the present

Table 1: Details of various risk factors in the occurrence of CVP in buffaloes

Risk Factors	Criteria	No. of buffaloes (910)	Affected animals (n=63)	Prevalence (%)	X^2 value	p-value
Rearing Systems	Extensive	99	16	16.16		
	Semi-intensive	535	24	4.48	18.89**	0.001
	Intensive	276	23	8.33		
Type of feed	Green fodder	263	9	3.42		
	Dry roughage	373	39	10.46		
	Green fodder + Dry roughage	166	5	3.01	23.3**	0.0001
	Dry roughage + Concentrate	41	7	17.07		
	Green fodder + Dry roughage + Concentrate	67	3	4.48		
	Mineral mixture	410	4	0.98		
Flooring Systems	Uneven	273	35	12.82		
	Brick	114	11	9.65	26.99**	0.0001
	Sloppy	523	17	3.25		
Parity	1st parity	84	8	9.52		
	2nd parity	236	9	3.81		
	3rd parity	444	23	5.18	32.61**	0.00001
	4th parity	78	13	16.66		
	5th parity	64	8	12.50		
	7th parity	4	2	50.00		

study may be attributed to feeds containing estrogenic substances, such as mouldy maize (Noakes *et al.,* 2001), or the consumption of large volumes of poorly digestible roughages (Peter and King, 2021). Buffaloes receiving mineral mixture had the least (0.98%) incidence of CVP in the present study. Animals housed on uneven flooring had the higher CVP prevalence (12.82%) compared to brick (9.65%) and sloppy (3.25%) floor (Table 1). This finding supported the previous research (Mishra *et al.,* 1998; Bhatti *et al.,* 2006; Abdullah *et al.,* 2015) and suggests that floor type is a critical factor contributing to CVP development, likely due to increased intra-abdominal pressure and gravitational forces.

Further, the prevalence of CVP was highest in buffaloes with 7th parity (50.00%) followed by 4th (16.66%), 5th (12.50%), 1st (9.52%), 3rd (5.18%), and 2nd (3.81%) parity (Table 1). This finding contradicted with the previous study (Vikas *et al.,* 2019) that reported a higher incidence in 1st parity. However, the results are consistent with other studies (Dharani *et al.,* 2010; Honnappagol and Tandle, 2010; Hasan *et al.,* 2017; Selvaraju *et al.,* 2023) that found older, parous animals to be more susceptible to genital prolapse probably due to factors such as excessive relaxation of pelvic ligaments, low energy reserves, hypocalcemia, poor uterine tonicity, and irregular estrogen to progesterone ratios, as well as the stretching and loosening of genital tissues with each parity.

Effects of the Cervico-Vaginal Prolapse

Among the buffaloes that affected with CVP (n=63), the highest prevalence of cervico-vaginal prolapse (CVP) was noted during the 9th month (31.74%) of gestation followed by 10th and 8th (28.57% each) and 7th (11.11%)(Table 2). This was consistent with a previous study by Sah and Nakao (2003). The increased incidence of CVP from the 7th month of gestation onwards may be attributed to factors such as increased abdominal pressure due to fetal and placental growth (Patidar *et al.,* 2010), and the softening of genital ligaments caused by increased estrogen synthesis from the placenta (Sah and Nakao, 2003). Its prevalence was higher in winter than summer (57.14 vs 42.86%, Table 2) consistent with the finding of Kumar and Singh (2009). However, Kumar *et al.* (1988) and Bhatti *et al.* (2006) reported a higher prevalence of CVP in summer. The seasonal calving pattern in female buffaloes may contribute to the higher incidence in summer (Bhatti *et al.,* 2006). In western countries, factors such as reduced exercise (Cady, 2012), increased calving rates (Abbas and Fahad, 2016), and cold weather (Peter and King, 2021) may also contribute to the higher prevalence of CVP during winter months.

Among buffaloes that experienced CVP, 42.86% buffaloes had experienced dystocia (Table 2). Dystocia in CVP cases often results from incomplete cervical dilation, which may be attributed to alterations in inflammatory mediator activation, such as cytokines, and changes in endocrine activity during the birth process (Honparkhe *et al.,* 2009; Sangly *et al.,* 2022). The present study found that 28.57% of buffaloes with CVP experienced uterine prolapse during parturition. This differed significantly from the finding of Selvaraju *et al.* (2023), who reported a much lower incidence of 4.49% in CVP-affected buffaloes. The discrepancy in results may be attributed to variations in management practices, nutritional deficiencies, and hormonal imbalances among the studied populations. The study found that buffaloes with prolapse were more likely to give birth to male calves than female calves (58.73% vs 41.27%, Table 2). In buffaloes with prolapse the birth of male calves is more common, with longer gestation periods, increased risk of dystocia (Abbas and Fahad, 2016) and higher activity levels (Patidar *et al.* (2010). The birth of dead fetus was recorded among 37% of CVP-affected buffaloes.

It was found that 30.16% of buffaloes each experienced RFM and metritis (Table 2), which contrasts with the significantly lower rate of RFM as 1.12% reported by Selvaraju *et al.* (2023) in buffaloes with third-degree CVP. Prompt and effective treatment of prolapse is crucial to preserving the fertility of affected animals (Patidar *et al.,* 2010). The study found that 36.5% of buffaloes with cervico-vaginal prolapse experienced a recurrence in their next pregnancy, suggesting a possible genetic predisposition to the condition (Sah and Nakao, 2003). Other studies found even higher recurrence rates of prolapse: 50% (Nanda and Sharma, 1982) and 63% (Sah and Nakao, 2003). It was found that 0.8% had prolapse unrelated to pregnancy. Feeds containing excessive estrogenic substances (Samanta *et al.,* 2004, Islam *et al.,* 2020), such as mouldy maize and bajra, can contribute to the occurrence of vaginal prolapse outside of pregnancy.

Table 2: Details of various effects of CVP in affected buffaloes (n=63)

Risk Factors	Criteria	Buffaloes affected	% affected
Month of gestation	7th month	07	11.11
	8th month	18	28.57
	9th month	20	31.74
	10th month	18	28.57
Season	Winter	36	57.14
	Summer	27	42.86
Parturition	Dystocia	27	42.86
	Eutocia	36	57.14
Sex of calf	Male	37	58.73
	Female	26	41.27
After-effects	RFM	19	30.16
	Metritis	19	30.16
	Ut prolapse	18	28.57

Knowledge Level of Farmers on the Onset of CVP

The questionnnarie was made into two parts like etiological causes of the cervico-vaginal prolapse and the preventive measures. The survey revealed that 90.73% (323/356) of farmers were aware about CVP occurrence in advanced gestation. This finding was nearer to a previous study by Devansh *et al.* (2023), which reported that 67.33% of dairy

farmers in Punjab had knowledge about the prolapse condition. The survey revealed a significant knowledge gap among farmers regarding the importance of management practices, balanced feeding and mineral supplement in preventing CVP. Only 13.48% (48/356), 30.33% (108/356) and 9.55% (34/356) of farmers were aware of the management practices, mineral deficiency and hormonal imbalance as a cause of CVP respectively ,while a staggering majority were unaware about these causes of CVP. The findings emphasize the importance of strengthening the link between farmers and extension agencies to provide accurate information on management practices, role of mineral supplementation and balanced feeding that can help prevent CVP and minimize economic losses. These observations concurred well with the report of Devansh *et al.* (2023), emphasize the importance of educating farmers about the role of balanced nutrition and mineral supplementation in preventing obstetric complications like CVP, particularly during the last trimester of pregnancy. To address the knowledge gap on these aspects, it is essential to conduct more training programs, awareness camps, and distribute institutional materials to dairy farmers, educating them on the causative and risk factors of CVP. By doing so, farmers can better understand and manage the condition, ultimately minimizing the occurrence of this obstetrical complication in animals.

A significant proportion of dairy farmers (75.84%, 27/356) were aware that elevating the hindquarters in housing/ shed can help prevent cervico-vaginal prolapse. However, a notable 24.16% were unaware of this preventive method. Given the simplicity and potential impact of this practice, it is essential to promote it among the farming community through extension work. Further, only 20.78% (74/356) farmers knew that mineral supplement during advance gestation can prevent CVP, while rest were unaware of this benefit. It is essential to educate farmers on scientific health practices, such as providing mineral supplements, as conventional feed resources like maize and sorghum are often deficient in essential minerals like calcium and phosphorus, increasing the risk of CVP (Habib *et al.,* 2007). A substantial majority (81.46%, 290/356) of dairy farmers incorrectly believed that reducing feed and water intake could prevent prolapse. However, this practice is misguided, as advanced pregnant animals require a balanced and sufficient diet to support fetal growth and maintain their health. Restricting feed and water intake can actually exacerbate prolapse conditions. Limiting water intake can lead to dehydration, causing dry feces and increased straining during defecation, which worsens the problem. To address this misconception, dairy farmers were educated on proper feeding and watering practices, including providing water in divided doses to support pregnancy and hydration status.

Moreover, 76.40% (272/256) and 82.30% (293/356) farmers expressed awareness that application of rope truss and Buhner's sutures respectively on vulva can prevent recurrence of prolapse. This finding was consistent with a previous study by Devansh *et al.* (2023), which reported that 84% of farmers were aware of the rope truss method, however, in their study only 33% of farmers were familiar with the Buhner suture technique. These findings highlight the need for further education and awareness among farmers regarding the management of prolapsed mass to ensure timely and effective treatment. Notably, the rope truss method is a popular, effective, safe, non-invasive, and easy technique for retaining the prolapsed mass, particularly in rural areas (Lakde *et al.,* 2014; Sarma *et al.,* 2017). Thus, awareness campaigns using informative materials, discussions at farmer training programs, and *kisan melas* can help correct certain misconceptions and promote optimal management practices to reduce the occurrence and optimally manage the CVP, thus to minimize economic losses associated with CVP in dairy animals.

Conclusion

Our study recorded 10.44% (95/910) genital prolapse including 6.92% cervico-vaginal prolapse (CVP) and 3.52% uterine prolapse in buffaloes of YSR Kadapa district of Andhra Pradesh, and identified key risk factors for CVP through farmer surveys. The findings suggest that improved feeding and management practices during pregnancy can reduce CVP risk. Additionally, educating farmers about CVP through extension programs, such as leaflets, pamphlets, and workshops, is crucial for prevention and awareness.

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