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FACTORS ASSOCIATED WITH UTERINE TORSION IN CATTLE: A RETROSPECTIVE STUDY

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ABSTRACT
In the present study the dystocia due to uterine torsion, cervical indilation, malplacement, emphysema and other causes turned out to be 33.03, 24.77, 14.22, 22.48 and 5.5 percent, respectively. Study on predisposing factors revealed that Rathi and non-descript cows are more prone to uterine torsion than H.F. while Jersey being least among the three with 75, 15.28 and 9.72 percent incidence, respectively. Susceptibility to torsion seemed to increase with age from 3 to 7 years while beyond 7 years it tends to decrease. Most of the animals referred with torsion were in 2nd and 3rd parity with 40.28 and 30.56% cases, respectively while primiparous and multiparous beyond 3rd parity seemed to be less prone. Most cases of uterine torsion reported were at full term while a few being preterm with 94.44 and 5.56% cases, respectively. Fetal gender seemed to play a significant role in predisposing animals to torsion as the proportion of male and female fetuses born to the animals with torsion were 63.89 and 36.11%, respectively. It seemed that slippery pakka floor make animals highly prone to torsion than kaccha floor and loose housing with 68.06, 20.83 and 11.11% cases, respectively.

INTRODUCTION

Uterine torsion is the rotation of gravid uterus on its longitudinal axis that may or may not involve anterior vagina. It has been reported as a common cause of dystocia among dairy cattle (Frazer *et al.*, 1996; Aubry *et al.*, 2008) and may result in serious outcomes if delayed as in previous studies also reproductive disorders are found to a major contributing factor in bovine morbidity and mortality (Uttam *et al.*, 2015). The severity of uterine torsion together with time of occurrence in bovines puts undue stress over the animal and affect dairy business badly (Schonfelder and Hasenclever, 2005) also develops toxemia, deteriorates liver and kidney functions (Jeenger et al., 2015a) and even may lead to serious outcomes among the affected animals together with deterioration of subsequent fertility (Ghuman, 2010). Although some of the predisposing factors including breed, parity, age, stage of gestation, fetal gender, housing management together with prognostic tests have been pointed out in previous studies (Ghuman, 2010; Jeenger *et al.*, 2014, Jeenger *et al.*, 2015a) but a lot more research is lacking on the actual causes leading to uterine torsion. So keeping in view the importance and severity of outcomes a lot more contribution is required in the direction of predisposing factors leading to torsion so that ameliorative measures can be implemented to put down the incidences of uterine torsion. So the present paper deals with the evaluation of the incidence of uterine torsion out of total dystocia cases presented to departmental clinics together with major predisposing factors.

MATERIALS AND METHODS

The present study was conducted on 218 cases of dystocia in cows that were presented to the clinics from November 2012 to October 2014 based on clinical observations, data recording and history taking, similar studies have been carried out previously (Frazer *et al.*, 1996; Jeenger *et al.*, 2015b).

RESULTS

Out of the total 218 cases of dystocia, 135 (61.93%) and 83 (38.07%) were of maternal and fetal origin, respectively. Uterine torsion was a major cause (33.02%) of the total dystocia cases of maternal origin in cows (Table 1).

DISCUSSION

The incidence of uterine torsion among total dystocia cases noticed in the present study (33.02%) was slightly greater than previous studies with 3-28% incidence (Morten and Cox, 1968; Pearson, 1971; Manning et al., 1982). Usually uterine torsion is predominant cause of dystocia among buffaloes (Jeenger *et al.*, 2015b) while among cows different attributing causes for dystocia reported so far may be the cervical indilation (Purohit *et al.*, 2011), feto-maternal disproportion mainly among primiparae and fetal malposition mainly among pluriparae (Mee, 2008). The probable reason of higher percentage of uterine torsion cases presented at referral centre in the present study may be the inefficiency of farmers and local practitioners in resolving cases of torsion (Aubry *et al.*, 2008) especially precervical ones, while they are proficient in handling usual cases of dystocia. In past few years as the stall feeding has increased animals are kept in confined space for longer duration of time leading to lack of proper exercise also

Table 1: Monthly summary of cases of dystocia among cows

Month	Maternal				Fetal			
	Uterine torsion	Cervical Indilation	Others	Total	Malplacement	Emphysema	Others	Total
November (2012 and 2013)	4	5	-	9	3	2	-	5
Dec (2012 and 2013)	5	2	1	8	2	7	-	9
Jan (2013and 2014)	5	5	1	11	1	-	1	2
Feb (2013and 2014)	9	5	-	14	8	3	1	12
Mar (2013and 2014)	4	4	3	11	6	6	-	12
April (2013and 2014)	5	2	-	7	2	3	-	5
May (2013and 2014)	9	7	1	17	3	7	-	10
June (2013and 2014)	6	6	-	12	2	3	-	5
July(2013and 2014)	5	3	1	9	-	2	-	2
Aug (2013and 2014)	5	6	1	12	2	6	-	8
Sept (2013and 2014)	7	7	1	15	1	5	1	7
Oct (2013and 2014)	8	2	-	10	1	5	-	6
Total (218)	72 (33.03%)	54 (24.77%)	9 (4.13%)	135 (61.93%)	31(14.22%)	49(22.48%)	3 (1.37%)	83 (38.07%)

Table 2: Uterine torsion in relation to breed, age, parity, stage of gestation, fetal gender and housing management of cattle

Breed of dam	H.F. cross	11/72 (15.28%)
	Jersey	7/72 (9.72%)
	Rathi and non-descript	54/72 (75%)
Age of dam	<3 yrs	4/72 (5.56%)
	3-5 yrs	18/72 (25%)
	5 -7 yrs	36/72 (50%)
	>7 yrs	14/72 (19.44%)
Parity of animal	1st parity	14/72 (19.44%)
	2nd parity	29/72 (40.28%)
	3rd parity	22/72 (30.56%)
	>3rd parity	7/72 (9.72%)
Stage of gestation	Pre term	4/72 (5.56%)
	Full term	68/72 (94.44%)
Gender of fetus	Male	46/72 (63.89%)
	Female	26/72 (36.11%)
Housing management	Indoor on pakka floor (slippery)	49/72 (68.06%)
	Indoor on kachcha floor	15/72 (20.83%)
	Loose housing	8/72 (11.11%)

there are potent chances of animal getting slipped suddenly, both of above defined factors predispose gravid uterus to rotation. The other predisposing cause may be the unstable anatomical arrangement of the gravid bovine uterus (Sloss and Dufty, 1980; Roberts, 1986) especially during advance pregnancy. Also when cow lies down or raises, the gravid cornua gets suspended almost vertically in the abdominal cavity thus making it prone to torsion (Roberts, 1986). Increased fetal movements, sudden push from another cow, weak broad ligament musculature, uterus outside bursa supraomentalis (Ghuman, 2010) and flaccid uterine wall (Pearson, 1971; Frazer *et al.*, 1996) are also some of the contributing factors.

Present study revealed that uterine torsion was not affected much by season and usually coincides with peak calving period (Frazer *et al.*, 1996). No direct involvement of season was noticed under the present study but as the total calving together with other usual cases of dystocia referred to clinic increased the increase in the incidence of uterine torsion cases was noticed simultaneously.

Multipara were at greater risk of uterine torsion than primipara (Manning *et al*, 1982; Roberts, 1986; Jeenger *et al.*, 2015b). The probable reasons may be the larger abdominal cavity, stretching of pelvic ligaments, loose and long broad ligaments together with loosening of uterine tissue and decreased uterine tone in aged bovines (Roberts, 1986; Aubry *et al.,* 2008).

Among the multiparous cows (with age 5-7 years and onward) as the age increased incidence of uterine torsion decreased (Table 2). Probably as the parity and age increases after a certain level the uterine muscle thickness increases which resist uterine movement, its destabilization and loosening (Mochow and Olds, 1966).

Most animals (94.44%) in the present study (Table. 2) were at full term pregnancy (Manning *et al.*, 1982; Ghuman, 2010). During advanced pregnancy increase in flaccidity of uterine wall, fetal size and movements along with decreased quantity of amniotic fluid in comparison to the size of fetus and uterus may predispose animal to uterine torsion (Roberts, 1986; Ghuman, 2010).

The incidence of uterine torsion among Rathi and Nondescript breeds was quite higher than the crossbreds (Table. 2). Among crossbreds Jersey breed was found less prone to uterine torsion than H. F. cows (Frazer *et al.*, 1996). Probably the deeper and capacious abdomen of Rathi and nondescript breeds (in comparison to their body size) creates extra space allowing axial twisting of uterus. Also the unstable uterus of Rathi and Non-descript cows is more prone to get displaced easily.

Greater proportion of the fetuses delivered to uterine torsion

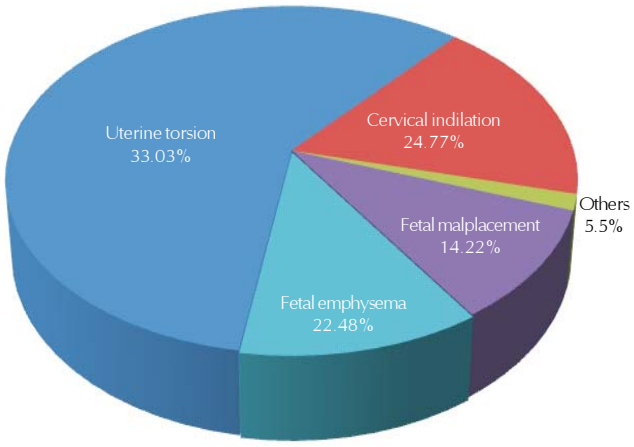

Figure 1: summary of cases of dystocia among cows

affected cows were male (Table 2) (Frazer *et al.*, 1996; Jeenger *et al.*, 2014). It is attributable to the greater body weight of male fetus to that of female fetus (Morten and Cox, 1968; Sloss and Dufty, 1980). The difference may also be related to hormonal changes that occurred during the last stage of labor and vigorous movement of the male relative to the female fetus.

The role of managemental factors was found to be of significant importance as in the present scenario its being difficult to have proper housing and feeding management especially among rural areas (Sen *et al.*, 2014). In the present study the incidence of torsion was found higher among the animals kept in-door than the animals managed on loose housing (Table. 2). Among indoors, the animals which were managed on pakka floor were more prone to uterine torsion than those managed on kachcha floor as has been shown in previous works that chances of sudden injuries and accidents are higher in pakka floor (Uttam *et al.*, 2015). Probably on pakka floor there are much chances of animal getting slipped suddenly so the gravid uterus becomes unstable and displaces easily (Roberts, 1986). Also confined housing together with the lack of proper exercise for long periods (especially during advanced pregnancy) may tender weakening of the abdominal musculature (Sloss and Dufty, 1980; Roberts, 1986) rendering it liable to get displaced easily while animals managed on loose housing tend to have proper exercise. Also among the stall fed animals there are chances of being hit on its side by the accompanying cattle (Aubry *et al.*, 2008) leading to rotation of prone uterus.

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