



Retrospective study of clinical attributes related to uterine torsion in goats[#]



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Abstract

Uterine torsion is one of the serious obstetrical maladies encountered in domestic animals. It is defined as the rotation of the uterus along its longitudinal axis. A retrospective study of uterine torsion among goats presented to Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Pookode was done during the period from January 2021 to July 2023. The overall incidence of uterine torsion was 19.62 per cent (21/107) out of total obstetrical cases attended during this period with higher occurrence reported in animals within the age group of one to two years (7/21, 33.3%) and in pluriparous animals (11/21, 52.4%). Also, animals with unicornal pregnancy and carried single foetus in utero contributed a greater proportion (15/21, 71.4%) to the occurrence of uterine torsion. More prevalence of pre-cervical (11/21, 52.4%), right sided (12/21, 57.14%) and ≤ 180 degree (11/21, 52.4%) uterine torsion was observed in the present study.

Keywords: Uterine torsion, goats, incidence

Goats have become economically beneficial to people living in arid, semiarid, hilly, and remote tribal areas, due to their tolerance to harsh weather conditions, ability to feed on inferior quality crop residues, high prolificacy, short gestation period and rapid growth rate. Out of the total world goat population, 94.36 per cent goats are located in Asia and Africa. As per the 20th livestock census, 148.9 million population are goats (Hegde, 2020). Dystocia is one of the main constraint for the goat farmers as it results in huge economic losses either due to the death of new born

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or dam or impart adverse effect on the fertility of dam (Mcsporrán, 1980). Uterine torsion is defined as twisting of the gravid uterus along its longitudinal axis. It is observed in various species of animals and more commonly seen in bovines, very rarely in sow and occasionally reported in beef cows, bitches, queens, ewes, does and mare (Selvaraju and Karthick, 2020). There are many predisposing factors for the occurrence of uterine torsion *viz.*, accidental falling of advanced pregnant goats, rolling habit of the animal, lack of exercise, reduced foetal fluid, excessive foetal movements and frequent gradient walking in hilly areas (Roberts, 1971). Compared to other domestic animals the incidence of uterine torsion is less in goats due to sub-lumbar attachment of broad ligament rather than sub-iliac attachment in cattle and buffaloes. In addition, compared to large ruminants, goats have higher prolificacy rate. Hence, there are frequent bicornual pregnancies in this species which stabilises the uterus (Sood *et al.*, 2002). On perusal of literatures, the lowest incidence rate of uterine torsion in goats (1.72 %, 2/116) was reported by Gupta *et al.* (2020) and the highest incidence rate (14.17 %, 36/254) was reported by Baria *et al.* (2023). In goats, diagnosis of uterine torsion is difficult due to inability to perform per rectal examination as in cattle and buffaloes (Scott, 2012). Sudha *et al.* (2019) observed that doppler ultrasonographic study of uterine blood flow could be helpful in the diagnosis of uterine torsion in Malabari goats. In severe cases of uterine torsion, obstruction of the blood supply to the uterus resulted in congestion, oedema, shock, death of the foetus and even gangrene of the uterus (Roberts, 1986). This will affect the future fertility of the dam and any delay in the diagnosis and correction leads to death of the dam due to the development of generalised bacteraemia, endotoxaemia and cardio-vascular failure (Schonfelder *et al.*, 2005). Hence, the present work was carried out to study the incidence of uterine torsion among goats in terms of various maternal and foetal factors as well as different characteristics of uterine torsion.

The study was conducted in goats presented to the Teaching Veterinary Clinical Complex, College of Veterinary and Animal

Sciences, Pookode with the history of obstetrical complications. Retrospective data was collected from the records maintained at the clinics during the period from January 2021 to July 2023 to recover the overall incidence rate of uterine torsion in goats. The incidence of uterine torsion was studied with reference to various factors such as age and parity of the dam, number and sex of the foetus, type, side, degree and duration of uterine torsion. Grouped frequency distribution of the collected data was done in this study. Incidences of uterine torsion in relation to maternal and foetal factors affecting the torsion is presented in Table 1.

The overall incidence of uterine torsion among goats during three-year period was 19.62 per cent (21/107) (Fig. 1). The finding was in agreement with Balasopoulou *et al.* (2022) who reported 19.9 per cent of ovine uterine torsion cases out of 302 cases of dystocia. A comparatively lower incidence rate of 9.66 per cent and 10.53 per cent was reported by Sudha (2019) and Sharma *et al.* (2014), respectively. Out of 62 cases of dystocia with maternal origin in buffaloes, Srinivas *et al.* (2007) reported an incidence of 83.33 per cent of uterine torsion. The lower incidence of uterine torsion in goats when compared to cattle and buffaloes could be due to sub-lumbar attachment of broad ligament and frequent bicornual twin pregnancies (Roberts, 1986; Noakes *et al.*, 2009). The increased incidence of uterine torsion in the present study might be due to hilly topography of the area where the study was conducted and greater athleticism of goats which exacerbate the condition.

Out of 21 cases of uterine torsion, the incidence was highest animals aged between one to two years (7/21, 33.3%), followed by two to three years (6/21, 28.6%), three to four years (5/21, 23.80%), and animals older than four years (3/21, 14.3%) (Table 1). Similar findings were also reported by Frazer *et al.* (1996) who observed that older cows (31/790) had a lower incidence of uterine torsion. In contrast to the current study, Sudha (2019) observed that older goats were more likely to experience uterine torsion (10/23, 43.47%). The lower incidence noticed in aged animals in the present study might be due to a smaller number of animals

presented to the clinics within this age group. Rearing of animals beyond four years of age was less common among goat farmers.

The occurrence of uterine torsion was higher in pluriparous animals (11/21, 52.4%) than nulliparous (6/21, 28.6%) and primiparous (4/21, 19.0%). The result of the present study was also in agreement with Sudha (2019), they reported higher incidence of uterine torsion in pluriparous (65.22%) goats. Baria *et al.* (2023) also reported higher occurrence of uterine torsion in pluriparous goats (23/36, 63.89%) than primiparous animals (13/36, 36.11%). This could be due to the weakness and lack of tonicity of broad ligament in pluriparous animals Aubry *et al.* (2008). In addition to this, weakness of abdominal musculature and capacious abdomen in pluriparous animals might also be the reasons for increased predisposition of uterine torsion in relation to the parity of the animal in the present study.

In the present study, goats bearing single foetus (71.4%) were more prone to uterine torsion as compared to twins (23.80%) and triplets (4.8%) however, triplet pregnancies are less common in the population (Table 1). The present study is in agreement with the observations of Gupta *et al.* (2021) and Baria *et al.* (2023) who recorded 88.89 per cent and 97.22 per cent of singleton pregnancies in torsion affected goats, respectively. Unequal number and distribution of kids *in utero* might also be a causative factor for uterine torsion in goats (Jayakumar *et al.*, 2013). Twin pregnancies in ruminants which are distributed equally in both the horns create a broader base for the uterus to rest on the abdominal floor and can fill the abdominal cavity which may prevent uterine torsion in these animals (Roberts, 1971).

Out of 21 cases of uterine torsion, majority of the goats delivered male kids alone (12/21, 57.14%) while the proportion of animals delivered female kids alone were 33.33 per cent (7/21) and those which delivered both male and female kids were 9.53 per cent (2/21) (Table 1). Also, out of total 28 kids delivered for goats affected with uterine torsion, 67.86 per cent were male (19/28) and 32.14 per cent were

female (9/28) kids. Sudha (2019) reported that 56.25 per cent of kids born to torsion affected does were males and remaining 43.75 per cent (7/16) were females. It may be concluded that, male kids might have greater body size than female kids resulting in increased weight of the uterus which predispose to uterine torsion.

In the present study the incidence of pre-cervical and post-cervical uterine torsion was nearly equal (52.4 and 47.6%, respectively) (Table 2). In contrast, Sudha (2019) observed higher proportion (70%) of post-cervical uterine torsion in goats. Also, Baria *et al.* (2023) reported significantly higher ($P < 0.01$) incidence of post-cervical uterine torsion (77.78%, 28/36), whereas pre-cervical uterine torsion was reported only in 22.22 per cent (8/36) cases. The higher incidence of post-cervical uterine torsion in various studies could be due to misinterpretation of pre-cervical uterine torsion as incomplete cervical dilatation and limitation in performing per-rectal examination in goats (Scott, 2011).

Degree of torsion could be determined by number of twists in the body of uterus by per rectal examination in case of pre-cervical uterine torsion and number of twist present in the vaginal wall by per vaginal examination in post-cervical uterine torsion in bovines (Noakes *et al.*, 2009). In the present study, there was no appreciable variation in the proportion between ≤ 180 and > 180 degrees (52.4 and 47.6%, respectively) of uterine torsion cases (Table 2). An equal proportion (50-50%, 18/36) of ≤ 180 and > 180 degrees of uterine torsion was recorded by Baria *et al.* (2023) among 36 goats affected with uterine torsion, which was in close agreement with the present study. This could be attributed to sub-lumber attachment of broad ligaments which might have a role in preventing a more degree of uterine rotation in goats besides uterine instability. Sudha (2019) reported >180 degree torsion in 60 per cent cases in caprine. Gupta *et al.* (2021) classified uterine torsion in small ruminants into 90° , 180° , 270° and 360° with an incidence rate of 37.04, 44.44, 11.11 and 7.41 per cent, respectively.

In post-cervical uterine torsion, the direction of torsion can be identified by palpating

Table 1. Grouped frequency distribution of maternal and foetal factors related to uterine torsion in goats

	Characteristics	Category	Number (n=21)	Per cent (%)
Maternal factors	Age (years)	1-2	7	33.3
		>2- 3	6	28.6
		>3-4	5	23.8
		>4	3	14.3
	Parity	0	6	28.6
		1	4	19.0
≥2		11	52.4	
Foetal factors	Number of kids	Single	15	71.4
		Twin	5	23.8
		triplet	1	4.8
	Sex of the kid	Male	12	57.14
		Female	7	33.33
		Male and female	2	9.53

the spiral twist in the vaginal wall, which become tenser near to the cervix (Manning, 1982). The identification of direction in pre-cervical uterine torsion is difficult in goats due to inability to perform per-rectal examination (Scott, 2012). In the current study, incidence of right sided torsions was more (12/21, 57.14%) than left side torsion (9/21, 42.86%) (Table 2). Counterclockwise torsion (62%, 31/50) was reported more frequent than clockwise torsion (38%, 19/50) in dairy cattle (Aubry *et al.*, 2008). Higher incidence of right side torsion in bovines may be due to the presence of rumen on the left side, which might prevent rotation of gravid uterus to the left side as suggested by Robert (1971).

Most of the torsion cases presented were ≤ 24 h (15/21, 71.4%) of duration in the present study (Table 2). In contrast, Baria *et al.* (2023) reported that most cases of uterine torsion cases (58.33%) were presented after 24

h from the onset of symptoms, whereas 41.67 per cent was presented 24 h before. Frazer *et al.* (1996) reported that 55 per cent of uterine torsion cases in cows were presented within 24 h after onset of symptoms. Sudha (2019) reported that majority of the animals (80%) were presented 24 h after exhibition of clinical symptoms of uterine torsion. In consistent with the present results, several individual clinical case reports of uterine torsion in small ruminants were presented within 24 h after the exhibition of symptoms (Chahar *et al.*, 2018; Periyannan *et al.*, 2021; Dalal *et al.*, 2022). The estimation of duration of uterine torsion might be depend upon the behavioural history provided from the farmers.

Summary

From the present study, it may be concluded that incidence of uterine torsion among goats are potentially increasing. The

Table 2. Grouped frequency distribution of different features of uterine torsion in goats

Characteristics	Category	Number (n=21)	Per cent (%)
Direction of uterine torsion	Right	12	57.14
	left	9	42.86
Type of uterine torsion	Pre- cervical	11	52.4
	Post-cervical	10	47.6
Degree of uterine torsion	≤ 180 degree	11	52.4
	> 180 degree	10	47.6
Duration of uterine torsion	≤ 24h	15	71.4
	>24 h	6	28.6

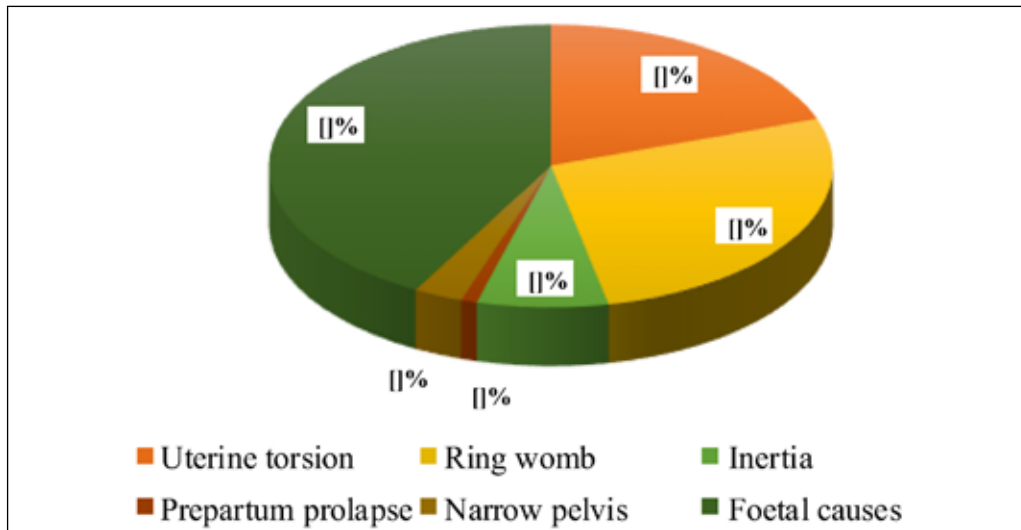


Fig. 1 Overall incidence of uterine torsion during the period from January 2021 to July 2023

overall incidence rate was 19.62 per cent with higher occurrence of right sided, pre-cervical and ≤ 180 degree of uterine torsion. The occurrence of uterine torsion was higher in pluriparous animals within the age group of one to two years and those carried single foetus. Among the presented cases, 12 animals delivered male kids and sex of the foetus influenced the occurrence of uterine torsion in goats. Most of the animals presented to the clinics within 24 h after the onset of symptoms of dystocia.

Conflict of interest

The authors declare that they have no conflict of interest.

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Note:

Sharma et al 2014 missing in reference