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Prevalence of Dystocia in Sheep and Goats: A Study of 70 Cases (2004-2011)

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ABSTRACT

A total of seventy (70) sheep and goats, suffering from dystocia were included in this retrospective study. At the time of presentation 28.57% of the animals were recumbent. More than half (54.29%) of the total cases were referred after unsuccessful handling. Significantly highest prevalence was recorded in sheep during first lambing, in winter season and in the dams carrying male fetuses ($p \leq 0.05$). The average weight of male and female fetuses was 3.14 and 2.75 kg respectively. Foetal dystocia (54.29%) out-numbered maternal causes (37.14%). Both maternal and fetal causes accounted for 8.57% of the dystocia. Head deviation, fore limb flexion, breech presentation, dog sitting position and fetal monstrosities were the common fetal causes. Ring womb, the most common maternal cause of dystocia could be treated by hormones in 33.33% (5/15) cases. Fetuses could be delivered by obstetrical mutation and extraction method in 51.43% (36/70) animals and by caesarean section in the remaining cases. Fetal and dam survival was 23.08% and 94.29% respectively. The average total cost for relieving dystocia in small ruminants by obstetrical mutation and by caesarean (including cost of suture and anaesthesia) was Rs. 215.00 and 570.00 respectively. From this study, it is concluded that in order to obtain high fetal and dam survival and also to reduce the cost of treatment, sheep and goats with dystocia should be presented without undue delay.

Introduction

The reproduction in sheep and goats; two commonly reared small ruminants, resemble closely in many ways. The incidence of dystocia in these two animals together has been reported from 2.2% to 4.4% (Scott, 1989; Thomas, 1992; Brounts *et al*., 2004). In sheep, the figures as low as 3% to as high as 34% have been reported (George 1976; Osuagwuh, 1980; Jackson, 1995), while in goats, 8.23% dystocia was recorded (Mehta *et al*., 2002). Various techniques for relieving dystocia have been described (Rahim and Arthur, 1982; Winter, 1999). In small ruminants, due to small diameter of pelvis, only limited manual manipulation of the fetus to relieve dystocia is possible (Mobini *et al*., 2002). Prognosis is always unpredictable for both dam and fetuses (Roberts, 1998). Report on the prevalence, management and outcome of dystocia in small ruminants under a defined study area is meager. The present study was thus planned to cover all the

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cases of dystocia in sheep and goats from 2004 to 2011 to record prevalence, management and outcome of dystocia. This study will help in adopting proper managemental practices of sheep and goats near the time of delivery under a temperate area.

Materials and methods

A total of seventy (70) small ruminants suffering from dystocia during a period of seven years (2004 to 2011) were the subject of the study. Immediately after presentation, anamnesis and clinical status of each animal was noted down. Detailed reproductive examination included identification of abnormalities of vulva (viz. edema, bruising and necrosis), occurrence of vaginal prolapse if any and presentation of extremities of fetuses outside the vulva. Species, breed, age, body weight and parity of the dam, date of presentation and sex, viability and number of newborn were recorded. Time elapsed from onset of labour to presentation were also recorded. Typical temperate seasons in Kashmir comprised of spring (March to May), autumn (September to 15th November), winter (16th November to February) and summer (June to August). Different etiological factors/causes of dystocia were also recorded. Animals were rehydrated if required, before subjecting them to any obstetrical maneuvers.

Caesarean section was performed when obstetrical manipulation and vaginal delivery was either unsuccessful or not indicated. Anaesthetic management for caesarean section involved line infiltration of local anaesthetic (1% lignocaine hydrochloride) alone following intravenous diazepam administration. Surgical intervention was made via right (6)/left (14) ventrolateral or oblique, right (5)/left (3) paralumber fossa or flank and right (4)/left (2) paramedian sites. After removal of the fetus/es, loose fetal membranes and evacuation of the fluid, the uterus was sutured in two layers using chromic catgut (no. 1) in an inversion (Lambert) pattern. Abdominal wall was closed routinely. Intravenous fluid (dextrose-normal saline) therapy was instituted perioperatively. Analgesics and antibiotics were administered preoperatively on the day of operation and same drugs were used for another 2 and 4 to 6 days respectively. Antiseptic dressing of the incision line was continued twice daily from day of operation up to 5 days after suture removal. All the animals were discharged on the day of surgery. Postoperative care was assigned to the local field veterinarian. The progress of the cases was ascertained regularly from the owner's on telephone every alternate day till suture removal. The animals were presented for suture removal on 10th postoperative day. At this occasion the dams were again weighed. Survival of fetuses and post-partum complications in the dams if any, were also recorded. Prevalence of dystocia with respect to species, parity and season and sex of newborn and fetal viability was subjected to statistical analysis by Z test using SPSS Software. Other parameters were expressed in percentage.

Results

At the time of presentation, 20 animals (28.57%) were completely recumbent. The remaining dams were either standing normally or attempting to stand. Average time from onset of labour to presentation of the animals for treatment was 27.38 (range 10-72) hours. Partial to complete anorexia was reported in most of the animals (57/70; 81.43%). Mild to moderate dehydration was detected in some (23/70; 32.86%) of the affected animals. Five animals showed pyrexia ($\geq 104^0$F). During vulval examination, edema and bruising was noticed in 11 animals (15.71%). In 19 dams (27.141%) extremities of fetuses were visible outside the vulva.

Most of the cases (47/70; 54.29%) had been referred. These animals were already handled either by inexperienced persons like quakes or animal attendants (17/70; 24.29%) or by field veterinarians (21/70; 30.00%) of the development departments.

In the present study, sheep significantly ($p \leq 0.05$) (52/70; 74.29%) out numbered the goats (18/58; 25.71%) (Table 1). 53.85% of the affected sheep were local/non-descript and the remaining (46.15%) were crossbred/up-graded. However, all the goats were of local/non-descript breed.

Maximum sheep and goats suffered during first delivery (28.57%), followed by third (22.86%) and second (21.43%), fourth (12.86%), fifth (8.57%) and 6th and above 6th parity (5.713%) respectively (Table 1).

Significantly ($p \leq 0.05$) highest prevalence was observed in winter (30/70; 42.86%) followed by spring (20/70; 28.57%), autumn (14/70; 20.00%) and summer (6/70; 8.57%) season, respectively.

Pre-partum vaginal prolapse was detected in

Table 1. Prevalence of dystocia in sheep and goats (n.=70) of Kashmir

Parameters (n)			No. of animals	Percentage
A) Species	Sheep (local-28 and crossbred-24)		52	74.29[a]
	Goat (local-18)		18	25.71[b]
B) Parity	1st		20	28.57[a]
	2nd		15	21.43[b]
	3rd		16	22.86[b]
	4th		9	12.86[c]
	5th		6	8.57[c]
	6th and above		4	5.71[d]
C) Season	Spring (March to May)	March (8)	20	28.57[a]
		April (8)		
		May (4)		
	Autumn (September to 15th of November)	Sept. (2)	14	20.00[b]
		Oct. (10)		
		Nov. (2)		
	Winter (16th November to February)	Nov. (3)	30	42.86[a]
		Dec. (6)		
		Jan. (9)		
		Feb. (12)		
	Summer (June to August)	June (0)	6	8.57[d]
		July (1)		
		Aug (5)		
D) Sex of newborn (78)	Male		48	61.54[a]
	Female		30	38.46[b]
E) Fetal viability	Live		18	23.08[a]
	Dead		60	76.92[b]

Values with same superscripts in a column under a particular group do not differ significantly ($p \leq 0.05$)

one of the ewes presented with dystocia.

Significantly higher ($p \leq 0.05$) number of dystocia was observed in dams carrying male fetuses (Table 1) than female (61.54% Vs 38.46%). Live fetus was recovered in 23.08% (18/78) animals (Table 1). Eight dams carried twin fetuses (10.26%) and all the remaining animals carried single fetus. The overall kidding rate calculated was 1.11 (78/70). In goats this value was marginally higher (1.22) than sheep (1.08). Average body weights of male and female fetuses were 3.14 and 2.75 kg respectively.

Dystocia due to fetal causes 54.29% (38/70) outnumbered the maternal causes (26/70; 37.14%). In a few cases (8.57%), both maternal and fetal causes contributed. Deviation of the head, fore limb flexion, breech presentation, dog sitting position and fetal monstrosities were the most common fetal causes of dystocia (Table 2). Defective posture of the fetus was detected in majority of the cases, however defective position alone or along with defective posture was also noticed in a few (Table 2) of them. A total of 31 fetuses were in anterior longitudinal presentation and remaining 11 were in only posterior longitudinal presentation. At delivery, the fetal skin surface was dry in 18 cases. Putrefactive changes were detected in 3 fetuses. Congenital anomalies were detected in 6 fetuses.

Ring womb was the most common (15/26) maternal cause of dystocia. Narrow pelvis also contributed in many cases. Uterine torsion was observed in 4 cases (clockwise post cervical – 2 and anti clockwise pre-cervical – 2).

Cervix could be dilated in 33.33% (5/15) of the cases suffering from ring womb following the administration of valethamate bromide (15 mg) and cloprostenol sodium (250 µg) (Table-3). In these cases, fetuses were removed within 12-15 hours. Remaining 10 animals did not respond during this period and were then subjected to caesarean sec-

Table 2. Causes of dystocia in sheep and goats (n.=70) of Kashmir

Causes		No. of animals	Percentage
Foetal causes (n.=38)	i) Head deviation	2	5.26
	ii) Head deviation and fore limb flexion	4	10.53
	iii) Breech presentation	4	10.53
	iv) Unilateral shoulder flexion	4	10.53
	v) Bilateral knee flexion with or without fetal defect	4	10.53
	vi) Bilateral shoulder flexion	2	5.26
	vii) Unilateral knee flexion	2	5.26
	viii) Dog sitting with or without limb flexion	6	15.79
	ix) Fetal defect with one or more postural defect	6	15.79
	Defective position with or without postural defect Dorso-pubic 2 Dorso-ilial + Postural defect 2	4	10.53
Maternal causes (n.=26)	i). Ring womb	15	57.69
	ii). Uterine torsion	4	15.38
	iii). Narrow pelvis	6	23.08
	iv). Uterine inertia	1	3.85
Maternal + Fetal (n.=6)	i). Narrow pelvis with fetal defect	4	66.67
	ii). Narrow pelvis with unilateral/ bilateral knee flexion	2	33.33

Table 3. Methods of relieving dystocia in sheep and goats (n.=70)

Technique		No. of animals relieved (%)	Dam survival number (%)
A. Obstetrical management	I. Hormonal and/ or mutation and extraction (n.=15)	5 (33.33%)	34 (94.44%)
	II. Mutation and extraction only (n.=55)	31 (56.36%)	
	Overall effect (n.=70)	36 (51.43%)	
B. Caesarean section (34)	(Ring womb=10, uterine torsion=4, Narrow Pelvis=10, unsuccessful mutation=10)	34 (100%)	32 (94.12%)

tion. In 51.43% (36/70) cases, fetuses could be removed by hormonal therapy and/or obstetrical mutation and extraction method. Caesarean was required in remaining 34 (48.57%) cases.

In the present study left ventrolateral or oblique approach for caesarian section was found advantageous over other surgical sites. In four of the animals subjected to surgery, tear had occurred in the uterus.

Dam survival was 94.29% (66/70). Two ewes with tear in the uterus died within 24 hours following caesarean. Another one ewe and one doe died 24 hours after achieving vaginal delivery. Retained fetal membranes following relief of dystocia (manually or surgically) were encountered in 21.43% (15/70) cases. Post-delivery metritis developed in another two animals that responded to intrauterine oxytetracycline.

Average weight of dams before and immediately after relieving of dystocia was 36.6 and 31.8 kg respectively. An average weight gain of 3.6 kg was recorded in dams during 10 days following delivery.

The average total cost of various medicines and accessories used while managing dystocia by obstetrical mutation was Rs. 215.00. This cost increased to Rs. 570.00 (including the cost of anesthesia and suture materials) when the animal was subjected to a caesarean section.

Discussion

Survival of the animals (and their fetuses) presented for treatment of dystocia irrespective of whether they are managed manually or surgically is directly related to their clinical status. Prolonged duration of dystocia and mishandling by quakes

and inexperienced persons resulted in deterioration of the clinical status. In our study, the animals presented with undue delay and those handled earlier showed typical toxaemic changes of varying magnitude. Some of the dams revealed pathology of the vulva.

In Kashmir, people generally keep sheep for mutton and wool purpose. Unlike sheep, goats are always kept in smaller herds or reared mainly for milk by the individuals who can not afford cow. Consequently, the population and therefore the prevalence of dystocia in sheep is more than that of goats and are reported in the available literature too.

In Kashmir, due to the readily available market, small ruminants are generally disposed off at an early age. Therefore we obtained lower prevalence of dystocia beyond 4th parity in these animals. More number of dystocia during 1st delivery is probably due to the narrow pelvis of the dams because of breeding the animals at young age and/or to poor management. Feto-pelvic disproportion has been reported as one of the main causes of dystocia in cattle (Dhaliwal, 1979) and ewes (Brounts *et al*., 2004).

In Kashmir, a temperate region of India, sheep and goats are seasonally poly estrus; showing estrus mostly during autumn and some in late spring. Maximum number of lambs and kids are born during winter, spring or autumn seasons. Consequently, birth related problems including dystocia are comparatively common in this period of the year.

In our study, significantly higher number of animals carried male fetuses. Similar findings were reported in cattle (Patterson *et al*., 1981). This may be due to larger size/body weight of male fetuses. Kidding rate was found slightly higher than the lambing rate. A kidding rate of 1.29-1.57 has been recorded earlier in crossbred Assam local goats with normal delivery (Bhattacharyya *et al*., 2008).

Fetal causes of dystocia in the animals of our study outnumbered the maternal causes. In ruminants easily movable head and neck along with longer limbs lead to postural defects of fetuses than to deviations in presentation or position (Benesch, and Wright, 2001).

Ring womb or failure of cervical dilatation was the main maternal cause of dystocia in animals included in this study. As per the available literature. Ring womb is accounted for an incidence of 20 to 30% of all dystocia cases (Jackson, 1995; Noakes *et al*., 2009) and may be increased upto 50% (Thomas, 1992). The cause is still unknown but may be due to a lack of release of hormones involved in softening collagen or a lack of response of the collagen in the cervix to hormonal stimulation (Palliser *et al*., 2006). A number of predisposing factors like hypocalcaemia, hypophosphataemia, hormonal or mineral imbalances, uterine inertia and breech presentation have also been incriminated (Purohit, 2006).

With the administration of valethamate bromide (15 mg) and cloprostenol sodium (250 µg) cervix could be dilated in 33.33% cases of ring womb. Earlier report indicated 68.6% success rate with PGF2α in ring womb condition (Ali, 2011).

The results of our study indicated higher incidence of uterine torsion as a cause of dystocia in small ruminants when compared to the dairy cattle reared in Kashmir (Buchoo *et al*., 2008). This finding is in contrast to reports from elsewhere (Roberts, 1998; Benesch and Wright, 2001). In ruminants, dorsal situation of greater curvature of uterus and ventral attachment of broad ligament favours uterine twist – a gravitational accident.

Mutation involves obstetrical maneuvers for relieving dystocia and is particularly beneficial under field conditions. However, caesarean is the only option when vaginal delivery is not possible or not indicated (Tibary, 2004).

The line infiltration of the surgical site employed in this study resulted in effective anaesthesia. This easy technique of analgesia for caesarean section is frequently used everywhere (Dawson and Murray, 1992; Fazili and Farhat Sayed, 1999). Although, the line block is the least challenging technique but it requires more volume of the local anaesthetic (Muir *et al*., 2000; Noakes *et al*., 2009).

In the animals of this study caesarean was conducted through 6 different surgical sites. The oblique low flank and paramedian approaches were found more suitable than the typical paralumber approach. Interference from the rumen and evisceration of small intestines prevented easy manipulation and exteriorization of uterus during left and right paralumber or flank laparohysterotomy. Left oblique approach was found better than right oblique approach. Intestinal evisceration occurred throughout the right side; however, the rumen did not interfere much when caudoventral incision was given on the left side of the abdomen.

Left oblique approach in standing cows has also been practiced earlier (Parish *et al*., 1995). Compared with the traditional vertical incision, the additional advantage of performing surgery at this site is that the incision can be extended more cranially (Kenneth, 2008). Paramedian approach either left or right, resulted in easy removal of fetus and expulsion of the uterine contents without abdominal contamination. However, more post-operative care, which is difficult to undertake under field condition of the developing nations, is required. All the operations were conducted while the dams were restrained in lateral recumbency. It facilitates exteriorization of the uterus, especially with oversized or emphysematous fetus and also reduces chances of abdominal cavity contamination (Noorsdy, 1979).

Two of the four animals with tearing of the uterus died. Excessive manipulation prior to surgery may lead to shock and death or other intra or post operative complications including adhesion formation and peritonitis (Kenneth, 2008). When caesarean section is undertaken as a last resort, outcome is more likely to become negative (Cattell and Dobson, 1990; Dawson and Murray, 1992). If it is chosen early in any dystocia case, procedure is more rewarding.

Duration of dystocia directly affects the survival of fetus and dam. Low fetal survivability in the animals of this study may be attributed to undue delay in presentation of the cases. Brounts *et al*. (2004) recommended that small ruminant dams should be referred for obstetrical help within 2 hours from the onset of stage-2 labour if no progress in delivery is made.

The placenta could be removed easily during manipulation or surgery in 31.43% (22/70) and shed within 12 hours of relieving of dystocia in another 41.43% (29/70) cases. Retained fetal membranes are more frequently (21.43%) encountered in animals with dystocia than giving unassisted births (Patterson *et al*., 1981; Bouchard *et al*., 1994). Leontides *et al*. (2000) found that the risk of retained foetal membrane in ewes that received assistance at lambing was 4 times than those that lambed normally.

The dam survival rate recorded in the present study following relief of dystocia with (94.12%) or without (94.29%) caesarean was almost similar to the survival rate in cows (96%) following caesarean section (Dawson and Murray, 1992). However, survival rate drastically reduces with delay in relief of dystocia. Further delay may result in dead or emphysematous fetus with greater percentage of maternal death (Cattell and Dobson, 1990; Bouchard *et al*., 1994). The most common complications associated with maternal deaths are peritonitis, toxaemia, metritis, uterine rupture and fatty liver (Dehghani and Ferguson, 1982).

The costs of treatment for relieving dystocia in the present study are much lower than the earlier estimates (Leontides *et al*., 2000; Brounts *et al*., 2004). Relieving dystocia by vaginal approach is cost effective under field conditions; however, caesarean section becomes necessary and unavoidable to save the valuable dam and or fetus at many occasions.

Conclusion

It is concluded that sheep and goats suffering from dystocia should be presented for treatment to specialists without any delay to save both fetus and dam. Emphasis should be given in attainment of pelvis size during breeding. Strict supervision is required in the maiden one during delivery.

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