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RETROSPECTIVE STUDIES ON DYSTOCIA IN EWES: CAUSES AND TREATMENT BY CESAREAN SECTION

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ABSTRACT

The objectives of the present study are to know the main causes of dystocia. A total of twenty-two native sheep suffered from dystocia. Cases were treated in the veterinary hospital/ teaching hospital / University of Sulaimani. Out of twenty-two sheep suffered from dystocia, 14(63.6%) resulted from fatal causes and 8(36.4%) from maternal causes. Fetal status represented by 4(28.6%), 2(14.4%), 3(21.4%), 1(7.1%), 3(21.4%) and 1(7.1%), for schistosomus reflexus, oversize, head deviation, breach presentation, bilateral shoulder flection and transverse presentation, respectively. While maternal causes are classified as, 4 (50%) for ring womb, 2(25%) for uterine prolapse and 2(25%), for narrow pelvis. Parity, sex of the fetus and viability of the fetus are considered predisposing factors to cause dystocia in sheep. All Emergency cases of dystocia are treated through cesarean section. The sequel of postoperative surgical operation is represented by 3(13.6%), 7(31.8%), 2(8%), and 1(4.5%), for retained placenta, metritis, uterine prolapse and bleeding, respectively. Whereas, the effect of cesarean section on the fertility of sheep is represented by 8(42.1), and 11(57.9%), for pregnant and non-pregnant, respectively. In addition, the mortality rate of sheep in the study reached 3(13.6%), because of postpartum uterine infections. In conclusion, generally dystocia in sheep results from fetal and maternal causes, and due to prolonged time of labor the early intervention by cesarean section could be for saving the lambs and the dam.

Keywords: Sheep, Fetal, Maternal dystocia, Cesarean section, Pregnancy.

INTRODUCTION

Dystocia is a main cause of the death of ewes and newborns during delivery resulting in serious harm to the birth canal and excessive use of force traction. Sheep are the most widely used as a source of meat, and milk, and support the national economy.

Sheep is considered one of the small ruminants with highly fertile domestic animals. Some researchers reported many reproductive diseases affect future fertility and lead to economic losses (Ismail 2017). Trauma and uterine infections because of complications of the condition as well as the cost of the treatment which may decrease future fertility. The incidence of dystocia may range (3.1-31%) of the reproductive problems in small ruminants, especially in sheep. Dystocia in animals generally refers to an abnormal or difficult delivery, in other meaning when the first or second stage of

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parturition is failed or prolonged (Majeed and Taha 1989, Thomas 1990). In such a condition of dystocia, the important point is the professional or obstetrician must intervene in order to save the dam and the newborn. Usually, many factors contribute to dystocia in sheep. First, maternal factors, which included narrowing of the birth canal, uterine inertia and failure of cervical dilation. Secondly, fetal factors such as abnormal presentation, posture and position of the lamb, fetal oversize as well as congenital anomalies like schistosomus reflexus. The mortality rate of the ewe and the lamb are increases when the treatment of dystocia delayed. Besides if dystocia is prolonged in ewes may lead to septic metritis which is considered fatal (Dwyer and Bünger 2012, Ismail 2017). Dystocia, when treated by surgical operation medical management is necessary for saving the ewe from postpartum uterine infections. Mostly the veterinarian advices administrating antibiotics and hormonal treatment after cesarean section to enhance or accelerate the uterine involution(Đuričić, Valpotić *et al.,* 2016). In obstructive dystocia, special surgical treatment or cesarean section usually is needed, and the cases are accompanied by systemic diseases or shock of the ewes (Khan, Satheesh *et al.,* 2018). Furthermore prolong the second stage of labor, uterine inertia or failure in medical management. Many authors reported that cesarean section was considered an effective way for treatment dystocia in sheep, especially when performed early after the onset of the signs of parturition (Kumar, Talekar *et al.,* 2013, Khan, Satheesh *et al.,* 2018, Bruce, Young *et al.,* 2021). Most research mentioned in this study deals with cases that came to the clinic as emergency conditions and without any information about the past of reproductive history, so the aim of the current study was to analyze and shed light deeper on the main causes of dystocia in ewes. In addition to, studying the effect of cesarean section as one of the best methods for treating dystocia on future fertility in sheep.

MATERIALS AND METHODS

Animals

A total of twenty-two (22) native sheep suffering from dystocia during a period of eight years from (February 2013 to February 2021) were the subject of the study. Whereby some of them were brought to the Veterinary Teaching Hospital of the College of Veterinary Medicine at the University of Sulaimani, while some conditions were brought to the veterinary hospitals which are dependent on the Sulaimai districts. The age of the sheep ranged from 1-4 years. The total cases were diagnosed depending on the case history, physical and careful vaginal examination. After the causes of dystocia were determined, which were fetal and maternal or both causes. In all uncorrected cases of dystocia, without successful fetal manipulation, cesarean section was selected which was the best method for delivering the fetus and saving the dam. Information about the age, parity, sex of lambs and different causes of dystocia were recorded. The general health of all ewes after cesarean section in this study was ideal, represented by standing after surgical operation in addition to, the normal movement, pulse and respiratory rate as well as the appetite.

Surgical procedure of cesarean section

Cesarean section was performed on twenty-two sheep suffering from dystocia when obstetrical manipulation and force traction failed and vaginal

delivery was either unsuccessful for delivery of the lamb. Surgical operation was done via right lateral recumbency under local analgesia according to(Badawi 2006, Galatos 2011). The animal was restrained on the operating table in right lateral recumbency. The traditional surgical approach is via a left flank laparotomy, left flank regional anesthesia of each sheep was prepared for routine aseptic surgery by clipping and shaving around the proposed surgical site; the site was scrubbed with strong tincture iodine solution. Local infiltration of analgesia using (2% lignocaine) and using line block, inverted L block. The site of the incision was covered by sterile towels, and controlled with clamps. The incisions were made midway between the last rib and 5cm below the level of the transverse processes of the lumbar vertebrae, and extending ventrally for 15 cm. The skin incision was made, and the subcutaneous adipose tissue was dissected out. Following the incision was then extended through the muscle layers and the peritoneum. The gravid uterus was exteriorized throughout the incision, and an incision was made in the greater curvature of the pregnant uterine horn. The fetus and as much of the placenta as possible were removed. The uterus was sutured in two layers using chromic catgut in an inversion (Cushing and Lambert) pattern. Then Abdominal muscle layers with the peritoneum were closed routinely mostly by a simple continuous pattern. Finally, the skin incision was closed using silk in simple interruption. For postoperative care, the animal was recommended injected with an antibiotic (procaine penicillin) for the subsequent five days. Post-operatively, all cases were routinely guarded by the owner and the suture material was removed after ten days. As well as the cases of this study all information associated with reproduction was recorded. In addition, the cases were followed up throughout the communication with owners to follow the progress of the cases and the fertility of the sheep during the estrous cycle in their seasonal reproduction and the occurrence of normal parturition after the gestation period.

RESULTS

Table (1), illustrated the different causes of dystocia in (22) native sheep. All cases of dystocia are classified as follows, 14(63.6%) cases firstly due to fetal cause, represented by 4(28.6%), 2(14.4%), 3(21.4%), 1(7.1%), , 3(21.4%) and 1(7.1%), for schistosomus reflexus, oversize, head deviation, breach presentation, bilateral shoulder flection and transverse presentation, respectively. The second cause of dystocia due to maternal causes, which was 8 (36.4%), results from a ring womb, uterine torsion and narrowing pelvis. The percentages of the conditions are as follows, 4 (50%), 2(25%) and 2(25%), respectively. Several factors affected the dystocia in the present study in sheep. These factors included parity, associated with 9(40.9%) for primiparous and 13(59.1%) for multiparous. Another factor related to the sex of the fetus, such as 14(63.7%) for male and 8(36.3%) for female fetuses. Fetal viability is divided as, 12(54.6%) for live and 10(45.4%) for dead fetuses, table (2). In the subject of the study, all sheep suffering from dystocia are treated by cesarean section. Several postoperative diseases caused the death of a number of sheep after the surgical operation. Table 3, revealed the following conditions during the study. Out of 22 sheep treated by surgical operation the number and the percentages of the states as follows, 3(13.6%) retained placenta, 7(31.8%) metritis,

2(9%) uterine prolapse, bleeding 1(4.5%), and 3(13.6%) for mortality rate of the dam. Finally, the results of the investigation showed the effect of surgical operation on the fertility of the sheep through a decrease in the pregnancy rate. Out of 22 remained ewes, 8(42.1%), and 11(57.7%), for pregnant and non-pregnant respectively, table, (4).

Table 1: Showing different causes of dystocia in sheep.

Fetal and maternal causes of dystocia	Description	No. of sheep	Percentage %
Fetal causes: (n=14)	1- Schistosomus reflexus	4	28.6
	2- Oversize	2	14.4
	3- Head deviation	3	21.4
	4- Breach presentation	1	7.1
	5- Bilateral shoulder flection	3	21.4
	6- Transverse presentation	1	7.1
Maternal causes: (n=8)	1- Ring womb	4	50
	2- Uterine torsion	2	25
	3- Narrow pelvis	2	25
Total		22	100%

Table 2: Some factors affect dystocia in sheep.

Factor	Description	No. of sheep	Percentage %
***Parity:** (n=22)	1- Primiparous	9	40.9
	2- Multiparous	13	59.1
***Sex of fetus:** (n=22)	1-Male	14	63.7
	2- Female	8	36.3
***Fetal viability:** (n=22)	1- Live fetus	12	54.6
	2- Dead fetus	10	45.4

Table 3: Diseases and mortality rate in ewes after cesarean section

Diseases and mortality	No. of ewes	Percentage %
Retained placenta	3	13.6
Metritis	7	31.8
Uterine prolapse	2	9
Bleeding	1	4.5
Death of sheep	3	13.6

Table 4: Pregnancy rate after cesarean section in sheep

Condition	No. of sheep	Percentage %
Pregnant	8	42.1
Non pregnant	11	57.9
Total	19	100

DISCUSSION

Cesarean section is considered the last trial for the treatment of dystocia in sheep. Generally, cesarean section is widely used for saving the dam and the lambs. Early intervention by performing surgical operations can lead to the delivery of live lambs' and healthier dams. The prolog time of dystocia significantly affected the survival of the dam and the newborn before the cesarean operation. Dystocia due to fetal causes was registered in this subject study which was 14(63.6%). Researchers (Purohit 2006, Bhattacharyya, Bhat *et al.,* 2015) in their investigation they mention several causes of dystocia in small ruminants such as fetal oversize, ring womb, abnormal presentation, position, posture and failure of birth canal dilation.

Schistosomus reflexus are more cases caused fetal dystocia in sheep in this research table (1). Schistosomus reflexus is a rare fatal congenital anomaly especially observed in small ruminants such as sheep. The case is characterized by, unclosed exposure of internal organs as well as skeletal defects and usually causes an obstetrical problem (Patel, Yadav *et al.*, 2015). Conditions of schistosomus reflexus have been also mentioned by (Özsoy, Oto *et al.*, 2009). In this study was recorded 4(28.6%), table (1), and this percentage is nearly similar by mention (Purohit 2006, Vidhya 2020). They reported these cases are causing major congenital anomaly that occurs during embryonic development. The etiology is unknown but it may be due to genetic factors, mutation, chromosomal anomalies, and caused dystocia in animals. Fetal oversize is the second fetal cause of dystocia which was 2(14.4%). This outcome was nearly similar to (Purohit 2006, Sharma, Kumar *et al.*, 2014, Ismail 2017). The abnormal progress and enlargement of the size of the fetus during embryological development results from more concentrated nutrition, age of dam as well and genetic factors (Akpa, Ifut *et al.*, 2002, Balasopoulou, Zablotski *et al.*, 2022). Out of 14 fetal causes, 1(7.1%) showed breach presentation due to dystocia related to the posterior longitudinal presentation of the fetus with bilateral hip joint flection. (Thedford 2019, Perumal and Sunder 2021) reported that abnormal fetal presentation is the general cause of dystocia in ewes. Other fetal causes of difficult parturition in sheep were mentioned in this survey, 3(21.4%), and 1(7.1%) for bilateral shoulder flection and fetal transverse position, respectively. Studies by (Ahmed, Malik et al. 2015, and Ismail 2017) stated major causes of dystocia in ewes were related to the fetal extremities and abnormal presentation. In this scientific work, out of 8 (36.4%) maternal causes of dystocia were represented by 4(50%), 2(25%) and 2(25%) for ring womb, uterine torsion and narrow pelvis, respectively. Ring womb in sheep caused stenosis of the cervix and impaired the delivery. In this investigation, the ring womb has been also explained by (Majeed and Taha 1989, Ghosh, Yeasmin *et al.*, 1992, Mostefai, Kouidri *et al.*, 2019). Cervix dilation during parturition is accomplished by the secreted hormones that control the delivery. In addition, the failure of cervix dilatation occurs when these hormones are impaired (Kerr 1999, Sofi and Zeebaree 2022). Hormones such as high concentrations of progesterone, prostaglandin F2α, and oxytocin, these hormones have been great role in the dilation of the cervix as well as adenosine triphosphate enzyme. Furthermore, BR Candappa and M Bartlewski 2011; Mahesh, Kamalakar *et al.*, (2014) concluded in their research that collagen fibers of the cervix may not have completely undergone their normal changes during parturition. Uterine torsion was observed during parturition in sheep in this study by 2(25%). It almost occurs in ruminants and is difficult to diagnose until signs of delivery (Naidu 2012, Tumer and Safak 2022). Uterine torsion has three degrees according to the twist of the gravid horn(Castillo, Dockweiler *et al.*, 2018, Baria, Chauhan *et al.*, 2023). In addition, it was difficult to treat using hormones or force traction, especially during the second and third degrees unless intervention by cesarean section (Khan 2018). The third maternal cause of dystocia was due to the narrowing of the pelvis of the dam which was recorded 2(25%) in the present work. Many references emphasized that the narrowing of the pelvis has a relationship to bad management when selecting animals for easy reproduction (Ali 2011, Ismail 2017, Jacobson, Bruce *et al.*, 2020). Small ages of animals used in reproduction as well as increased percentage of protein in provender especially in females decreased the growth of their pelvis and increased the overweight resulting in dystocia (Thomas 1990). Results in this study also showed predisposing factors of dystocia such as parity, sex of the lambs and fetal viability, table (2). Out of 25 sheep suffered from dystocia, 9(40.9%) were because of primiparous, while

13(59.1%) were due to multiparous. Primiparous always accompanies one of a factor that caused dystocia, in our study which was 9(40.9%). Sharma, Kumar *et al.*, 2014, Ismail (2017) considered the Fetopelvic disproportion is common in ewes when the size of an individual lamb is large compared to the pelvis of a dam. While the causes of dystocia due to in multiparous according to (Lafi, Al-Majali *et al.*,1998, Ali 2011) they revealed that dystocia in sheep was more common in multiparous sheep. The explanation may be because of age and hormonal disturbances in addition to mineral deficiency which are considered to be responsible for the dilation of the birth canal (Singh, Pipelu *et al.*,2017, Dutt, Singh *et al.*,2018). Some other factors of dystocia in the current study, including sex of the lambs, were 14(63.7%) for male and 8(36.3%) for the female lambs, these percentages agree with (Dwyer 2003, Dwyer and Bünger 2012). In addition, in the present research was registered in the field of fetal viability which was 12(54.6%), and 10(45.4%) for live and dead fetuses, respectively. Similar information was announced by Speijers, Carson *et al.,* (2010) their reports revealed, that male fetuses are major causes of dystocia than female fetuses in sheep because of their oversize. As well as the prolonged time of labor in sheep due to dystocia caused fetal death results of asphyxia and swallowing excessive fetal fluids, this agreed with (Jacobson, Bruce *et al.*, 2020). Postoperatively diseases or conditions are observed after cesarean section in the present study, table (3). All cases were represented by retained placenta3 (13.6%), metritis7 (31.8%), uterine prolapse2 (9%), bleeding1 (4.5%) and lastly the mortality of the ewes3 (13.6%). The disease of retained placenta in sheep is usually occurring after treatment of dystocia through cesarean section. This percentage of retained placenta is less than that mentioned by Sultan, Islam *et al.*,(2015) who revealed that the main causes are dystocia associated with fetal oversize, sex of the fetus, ring womb and congenital anomalies represented by schistosomus reflexus. Uterine infections of septic metritis type are more fatal if not treated properly in sheep. Tzora, Leontides *et al.*, (2002) approved that metritis is more common after a difficult delivery in sheep. The cases of metritis are the sequel of dystocia, retained placenta and unsanitary intervention to parturition(Mota-Rojas, Martínez-Burnes *et al.,* 2020). Uterine prolapse is also considered a factor that happens because of dystocia in sheep. Authors (Majeed and Taha 1995) supported the idea that prolonged time of uterine contraction results in dystocia leading to uterine prolapse in sheep. Bleeding or hemorrhage is less frequently mentioned in the study. The outcome of this abnormal condition after the surgical operation could be the result of high vascular channels available in the site of operation represented by abdominal muscle mass as well as the high pressure of the internal abdominal organs (Wranning, Marcickiewicz *et al.,* 2010). Less mortality of sheep was recorded in this research which was 3(13.6%). A study by Loi, Clinton *et al.*, (2006) suggested many causes of mortality of sheep after caesarean section such as shock because of loss of a large quantity of blood and postpartum uterine infections. Table 4, shows the state of pregnancy rate in sheep after cure of dystocia under cesarean section. Finally, out of 19 sheep, 8(42.1%), and 11(57.9%) were recorded as pregnant and non-pregnant ewes, respectively. Researchers in the field of theriogenology, such as Voigt, Najm *et al.,* (2021), suggested that the prognosis of caesarean section in animals may reduce the pregnancy rate because of complications of the surgical operation represented by ovaro-bursal adhesion and, ovaritis, and bilateral uterine obstruction (Ismail 2017).

CONCLUSIONS

Causes of dystocia in sheep are classified as fetal and maternal causes. Fetal causes

are more common in this study. In addition. many factors such as parity and sex of the fetus lead also to dystocia. Because of the prolonged time of labor; early intervention by performing a cesarean section shall result in the delivery of live lambs and save the dam.

CONFLICT OF INTERESTS

The author is declaring that there is no conflict of interest regarding the publication of this paper.

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دراسة عسر الولادة في النعاج : الاسباب والعلاج عن طريق العملية القيصرية

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الهدف من الدراسة الحالية هي معرفة الاسباب الرئيسية لعسر الولادة والعوامل الموءهلة وعلاجها باجراء العمليات القيصرية وحيث تم تقيم تاثير العملية على خصوبة الحيوان بعد اجراوها. اشيملت الدراسة على اثنى وعشرين من الاغنام المحلية التي عانت من عسر الولادة . تم علاج الحالات في المستشفيات القريبة من مركز محافظة السليمانية و المستشفى التعليمي التابع لجامعة السليمانية,وكانت الاسباب تتعلق بالجنين والام,حيث كانت (63.6%)14, بسبب الجنين و (36.4%)8, بسبب الام. حالات تتعلق بالجنين , (28.6%) 2, (14.4%) 3, (21.4%) 1, (7.1%) 3, (21.4%) و1(7.1%) , وكانت تشوه الجنين ,كبر حجم الجنين , وانحراف الراس ,قرفصاء الجلوس ,التواء مفصل الكتف الجنين وجنين مستعرض وعلى التوالي. يعتبر عدد الولادات, وجنس الجنين وحيوية الجنين من العوامل الموهلة لحدوث عسر الولادة في الاغنام.تم علاج جميع حالات عسر الولادة الطارئة عن طريق العملية القيصرية. تمثلت حالات المرضية بعد العملية الجراحية بنسة 3(13.6%) .7(31.8%) ,2(9%) و1(4.5%) لحالات احتباس المشيمة, التهاب الرحم , وتدلي الرحمم والنزف وعلى التوالي . بالاضافة الى ذلك ان معدل الوفيات الاغنام في هذه الدراسة بلغت 3(13.6%) بسبب تعقيدات الولادية. في الختام , فان عسر الولادة بشكل عام ينتج عن اسباب يتعلق بالجنين والام وبسبب اطالة وقت المخاض, يمكن ان يكون التدخل المبكر بالعملية القيصرية من اجل انقاذ الجنين والام.