European Journal of Biological Sciences 8 (3): 91-100, 2016
ISSN 2079-2085

DOI: 10.5829/idosi.ejbs.2016.91.100

A Review on Dystocia in Cows

Mollalign Mekonnen and Nibret Moges

Department of Veterinary Clinical Medicine, Faculty of Veterinary Medicine,
University of Gondar, Gondar, Ethiopia

Abstract: Dystocia can be defined as the inability of the cow to expel neonates through the birth canal from the uterus. This condition occurs as a result of problems with the dam's uterus or birth canal, or with the fetus. It can occur in conditions such as pelvic canal abnormalities, uterine inertia and neoplasm of the vagina, fetal oversize, incomplete cervical dilation and maldispositions of the fetus. Improper cervical dilation appears to be more frequent maternal cause of dystocia in cattle. The usual clinical signs are the onset of labor without delivery of fetus or fetal membranes and later regression of parturition signs. An incorrect diagnosis of dystocia may result in an unnecessary cesarean section.It most commonly occurs in heifers than mature cattle. The factors which influence the likelihood of dystocia include: infection, heredity, nutrition, calf sex, exercise, cow age and gestation length. Although dystocia cannot be eliminated from a herd; the incidence can be greatly reduced by management decisions made before the breeding season and during gestation. Economic losses associated with dystocia have severe consequences in dairy herds due to an increased number of still birth, maternal injury and calf mortality. Dystocia also negatively affects the productive and reproductive performance of lactating dairy cows due to increased risk for uterine diseases. As one of the reproductive problems in cows, it is important to prevent and reduce the incidence of dystocia and awareness on the significance of dystocia should be enhanced, which necessitate presenting the current literature review on dystocia.

Key words: *Cesarean section · Cow · Dystocia · Fetus · Maternal*

INTRODUCTION

Reproduction is an important consideration in the economics of cattle production. In the absence of regular breeding and calving at the appropriate time, dairy enterprise will not be profitable. A healthy calf each year is the usual goal of reproduction. This is possible only by increasing the reproductive efficiency of the animals. Successful reproduction encompasses the ability to mate, the capacity to conceive and nourish the embryo and deliver the viable young ones at the end of a normal gestation period [1].

When we talk about reproduction we talk among other things about pregnancy, calving and calf survival and especially in dairy about milk production. The most frequent situation concerning parturition is a normal birth, defined as "eutocia", but we can also have the opposite i.e. a difficult birth or "dystocia" and its diagnosis and treatment is important in veterinary practice [2, 3].

Dystocia as one of the reproductive problem may be defined as the inability of the dam to deliver its young through its own effort [3].According to Mee[4]the term dystocia comes from the Greek, *dys*-meaning difficulty and*tocos*- meaning birth and this situation may occur in many subjective cases and scales.Although no clear boundaries exist between eutocia and dystocia we can define dystocia as prolonged or difficult birth, when the first or the second stage of labor is prolonged and requires more assistance than desirable to deliver the calf [2].

We could wonder why dystocia is so important in the farm economy, because it is the major factor in calf mortality at or near birth [5]. The incidence of dystocia in various species is not satisfactorily recorded. Williams indicated that the incidence in cattle was about 3.3%. It is apparently higher in dairy than beef cattle. The incidence of dystocia appears higher in larger breeds such as the Holstein, Brown Swissand Hereford [6]. Therefore, the objective of this paper is:

Corresponding Author: Nibret Moges, Department of Veterinary Clinical Medicine, Faculty of Veterinary Medicine, University of Gondar, Gondar, Ethiopia.

- ✓ To overview the major causes of dystocia and its predisposing factors, to assess the economic significance of dystocia and the possible management approaches.

Dystocia: Gestation is the period from fertilization to parturition. The normal gestation period of the cow is 283-290 days which may vary based on sex and size of fetus [6].Parturition is the physiologic birth process by which the pregnant uterus delivers the fetus and placenta from the maternal organism.Parturition begins with softening and initial dilation of the cervix along with the start of uterine contraction and ends when the fetus and associated membranes are expelled. In normal parturition of cow there are three stages of labour: initiation and preparation for expulsion of fetus (Lasts from 4-24 hours), passage of fetus through the birth canal (Lasts from 30 minutes-3 hours) and expulsion of the placenta (Lasts 12-24 hours). But, if the labour is prolonged or beyond the normal parturition time, it is an indication of difficulty in birth or dystocia [4]. Dystocia means difficult birth and the corresponding Greek word for normal birth is eutocia [7].

Causes of Dystocia

Maternal Causes: Dystocia, which arises in the mother due to maternal factors, are caused either by constriction of the birth canal or by a deficiency of expulsive forces.The constrictive forms of which the most important are pelvic inadequacies, incomplete dilation of the cervix and uterine torsion [3, 7].

Feto-Maternal Disproportion: Fetomaternal disproportion is not only a factor by itself but a relationship between maternal and fetal factors and can be defined as an obstruction of calf expulsion originated by the calf size/birth weight or pelvic dimensions of the dam, that may have several factors in its origin[4].The dimensions of the bony pelvis are too small to allow passage of the fetus. This is most commonly caused by maternal immaturityand often occurs as a result of heifers being served at too young an age. A small pelvis is a component in dystocia due to fetopelvic disproportion and is exacerbated in cases where the fetus is larger than normal [3].

Incomplete Cervical Dilatation: Failure of the cervix completely to dilate is a relatively common cause of dystocia in the dairy bovine. It may occur both in the heifer and multiparous cows. Improper cervical dilation appears to be more frequent maternal cause of dystocia in cattle [8].

Formation of scar tissue due to injuries sustained at previous calving in aged animals, improper relaxation during parturition, congenital stenosis of the vagina, vaginal obstruction by fibrous bands, perivaginal abscess or cysts can occlude the genital passage and hinder with the delivery of the fetus. Dystocia due to an infantile vulva has been recorded in a Jersey heifer [9].

Uterine Torsion: Torsion of uterus usually occurs in a pregnant uterine horn and is defined as the twisting of the uterus on its longitudinal axis [10]. Rotation of the uterus on its long axis with twisting of the anterior vagina is a common cause of bovine dystocia. Uterine torsion is a complication of late first-stage or early second stage labour. It is probably due to instability of the bovine uterus which results from the greater curvature of the organ being dorsal and from the uterus being disposed anteriorly to its subilial suspension by the broad ligaments [11].

Uterine Inertia: The condition where the uterine expulsive forces fail to deliver a fetus is known as uterine inertia. Uterine inertia is classified conventionally into primary and secondary uterine inertia. The most common cause of primary uterine inertia in dairy cows is considered to be hypocalcaemia, with the animal showing signs of milk fever as calving is about to begin. When the uterine musculature becomes exhausted subsequent to failure of delivery of a maldisposed or oversized fetus or due to obstruction in the birth canal, then the condition is known as secondary uterine inertia. The contractions in the uterus then stop or become weak and transient. The animal shows no progress in parturition after the second stage of labor [9].

It is produced by lack of tone or failure of the uterine muscles to contract. Primary uterine inertia is failure of uterine muscle to contract normally at parturition which may occur due to failure of the muscle to respond to hormonal stimuli and disease of muscle or lack of failure to release hormones such as estrogen and possibly oxytocins, that intiate uterine contraction in normal muscles [6].

Hernia of the Gravid Uterus: Occasionally in cows hernia of the gravid uterus occurs through a rupture of the abdominal floor. The accident is one of advanced

pregnancy, occurring from the seventh months onwards in cows. It is probable that in the majority of cases a severe blow on the abdominal wall is the exciting cause although many observers have stated that it may occur without traumatic influence; the abdominal musculature becoming in some way so weakened that it is unable to support the gravid uterus. The site of the orginal rupture is the ventral aspect of the abdomen, at the right side in the case of cows. Ventral displacement of the uterus is an uncommon cause of dystocia in cows. It is seen in animals with a ventral hernia or rupture of the prepublic tendon where the pregnant uterus passes downward into the point of the hernia [8].

Fetal Causes: Broadly speaking, the fetal origins of dystocia in cattle can be divided into those caused by excessive fetal size relative to the maternal pelvis (Fetopelvic disproportion) and those caused by abnormalities of the fetus (Fetal monsters, fetal diseases and fetal maldisposition). Thus, in this study, fetal dystocia is reviewed according to fetal oversize and fetal abnormalities [9].

Fetal Oversize: A large number of studies conducted on dairy and beef cows point out that the calf birth weight, especially in 2-year old first calving heifers, significantly affects the difficultly in calving [9]. It has been well documented by numerous researchers that birth weight is usually the major factor causing calving problems. In fact, research from Miles City, Montana, would indicate birth weight is the trait most highly correlated with dystocia, followed by sex of calf, pelvic area and gestation length and cow weight. Genetics and breed of sire play the most important role in determining calf birth weight; however, the maternal genetic influence should not be overlooked. For example, the heritability of birth weight is nearly 48 percent. Therefore, by putting selection pressure on bulls for birth weight and calving ease, it would be possible to alleviate many existing calving problems [12].

Table 1: Effect of birth weight on ease of calving in percentage of 120 Simmental females

	Ease of calving			
	Normal birth	Hand pull	Mechanical puller	Caesarean section
No. of females	68	34	16	2
% of total	56.7	28.3	13.3	1.7
Birth weight (Ibs)	81.1	88.3	100.3	121.0

Source: Houghtonand Corah[12]

Fetal Maldispositions: Presentation is a relationship between longitudinal axis of dam with the longitudinal axis of foetus and parts present towards birth canal. The presentations are either longitudinal or transverse; the portion of the fetus that is approaching or entering the pelvic cavity or birth canal [6]. Position is the relationship between vertebral column of foetus with the four quadrants of pelvic inlet of the dam and it can be dorsal, ventral and lateral [7]. Posture is relationship between movable appendages of foetus with its own body. It signifies the relation of the extremities or the head, neck and limbs [13].

Most calves are presented with the front feet first and the nose resting on the front legs. Occasionally, the fetus will be backwards, breech (Buttocks first), head to one side or the other, or have one or both front legs back or a knee bent. Often, large calves will result in hip or shoulder lock. These abnormal presentations usually require some degree of assistance. Although abnormal presentations are thought to be repeatable (Cows that have an abnormally presented fetus once are more likely to do so again), there is little that can be done to reduce the relatively small percentage of calves that experience dystocia due to abnormal presentation [14].

Although calves coming backwards may be delivered spontaneously, posterior presentation is not normal in cows. Assistance during delivery may be required especially when fetopelvic disproportion is also present. Transverse presentation is also a malpresentation. An extremely unusual malpresentation in which the fetal body is found lying vertically across the pelvic inlet is the vertical presentation. In normal delivery the calf is in dorsal position with its spinal column beneath that of the dam. Abnormalities of position include ventral position, in which the calf is upside down, lateral position, when the calf is lying on its side. These abnormalities of position may also be seen when the fetus is in posterior presentation. Abnormality of posture may involve the head, forelimbs, hind limbs, or a combination of these [3].

Twinning: Twin gestation in cattle often culminates in dystocia. Twin dystocia is of three types: both fetuses present simultaneously and become impacted in the maternal pelvis, one fetus only is presented but cannot be born because of defective posture. position or presentation; posture is often most at fault, the lack of extension of limbs or head being due to insufficient uterine space; uterine inertia, defective uterine contractions are caused, either by the excessive fetal load,

or by premature birth. When inertia is present, birth of the first or second fetus does not proceed although presentation is normal [7].

Fetal Diseases: Various diseases of the fetus can result in the altered shape of the fetus and dystocia in cattle. Dropsical conditions of fetus resulting in dystocia include hydrocephalus, ascites,hydrothorax and anasarca [9]. Dystocia due to fetal ascites is an occasional dropsical condition in any species but most often in cows. A prolonged dystocia due to fetal ascites in a crossbred cow which was successfully managed with antibiotics, anti-inflammatory and supportive therapy following manual puncturing of fetal abdominal cavity with guarded knife to relieve dystocia [15].

The exact causes of these conditions are not known but disorders of fetal circulation/obliteration of fetal lymphatics usually results in anasarca and diminished urinary excretion in ascites. Hydrocephalus is accumulation of excessive fluid in dura matter or ventricles of brain. Hydrocephalus is assumed to arise from disturbances in normal circulation of cerebrospinal fluid resulting from its altered production or absorption [9].

Signs of Dystocia in Cows: Identifying the exact point at which normal birth ceases and dystocia occurs is not easy. Any apparent or suspected departure from the normal birth should be investigated. Specific signs of dystocia are: prolonged, non-progressive, first stage labor; the cow standing in an abnormal posture during first stage labor-in case of uterine torsion the cow may stand with a dipped back in the saw horse posture and failure of the calf to be delivered within 2 hours of the amnion appearing at the vulva. Obvious malpresentation, malposture, or maldispositions-for example the appreance of the fetal head but no forelimbs, the tail but no hind limbs, the head and a single forelimb, the appreance of detached chorioallantois, fetal meconium or blood stained amniotic fluid appears at the vulva [3].

The usual clinical signs are the onset of labor without delivery of fetus and/or fetal membranes and later regression of parturition signs. The cow may show signs of mild discomfort. The animal may adopt a rocking horse stance and show mild colic pain [16]. Partial anorexia, dullness and depression may be evident. One or both lips of the vulva are pulled in because of torsion of the birth canal. When the cervix is fully dilated it is not palpable as a separate structure and is continuous with the vagina. Incompletely dilated cervix is palpable through per rectum examination [9].

Diagnosis of Dystocia: The diagnosis of dystocia is based on the history and physical examination [17]. In cases of fetomaternal disproportion vaginal examination is often difficult. However, when called for acting on a dystotic labor, one must remember that all kinds of dystocia are possible and that during clinical approach, some steps must be followed. Therefore, when called, a brief history of the case should be asked to the owner [3]. Upon arrival at the farm this information is completed by inquiring for additional details about the clinical history to obtain as much pertinent history as possible and this should include: the expecting calving date (Gestation length); information about the sire; if the cow is first calving or notand, if pluripare, if previous calving evolved easily; for how long is the cow in labor; if there was any progress in calving; if some assistance has been given so far and which measures were undertaken. Some other questions about the recent health of the cow should also be asked [17].

Before starting the clinical examination, focusing on the following: physical condition and body condition score of the cow; is the cow standing or recumbent; brief physical examination; if there are any membrane or fetal part visible in the vulva; if so, identify the membrane and its condition or the fetal presentation and position; is there any vaginal discharge that may indicate, for example, fetal death [7].

The History of the Case: As the preliminary examinations and preparations for handling the dystocia are being made, the history of the case as well as certain other information should be obtained from the owner or by observation. This information should include: the duration of gestation; the previous breeding history; whether dystocia or any other abnormal condition was present at previous parturitions or the length of time the animal has been in active labor [6].

The General Clinical Examination of the Cow: The cow's physical and general condition should be noted. Body temperature and pulse rate should be noted and the significance of abnormalities considered. Particular attention should be paid to vulva [8]. Fetal movement should be noticed at the cow's left flank and if this is vigorous, it indicates the placental separation which

causes fetal anoxia and hypermotility, signs of placental separation may be seen at the vulva if part of the chrioallantois with detached cotyledons are visible, a light yellowish vaginal discharge may indicate fetal anoxia or fetal death with associated expulsion ofmeconium [13].

Specific Examinations: The cow should be restrained for the safety of the veterinarians, any assistances and the animal concerned, in a clean environment. With an assistant holding the tail to one side, the external genitalia and surrounding parts are thoroughly washed since the tail hairs are frequently introduced into the vulva and vagina and can cause severe lacerations. Without the previous induction of epidural anaesthesia and the resultant paralysis of the rectum, it is almost impossible to make a vaginal examination in the cow without introducing some faecal contamination. If on examination the vagina is found to be empty, attention should be directed to the cervix [7].

Vaginal Examination: After washing the genital parts of the cow and the arms and hands of the obstetrician, the internal examination starts. During this examination the vagina, vulva and the uterus should be checked for possible injuries, to ascertain the dilatation of the cervix and finally the position, viability and size of the calf [17,18]. The lubricated hand should be inserted into the vagina and the condition of the cervix is assessed. If the cervix is closed, the protruded but soft external os can be identified but fully dilated cervix cannot be distinguished because the vaginal walls remain continued with the uterine wall. The size of the pelvis should also be determined whether it is narrow or normal. It also ascertains whether the forelimbs or hind limbs are present in the birth canal [13].

Rectal Examination: When stenosis of the cranial vagina is detected during the vaginal examination, a rectal examination is also indicated to confirm the existence of uterine torsion. Examination of the reproductive organs by palpation per rectum is indicated in only few cases of dystocia. The most common indication for rectal palpation is to confirm uterine torsion when stenosis of the cranial vagina is detected during a vaginal examination. Pelvic deformities and exostoses may be more readily detected by palpation per rectum than by vaginal examination [19].

Predisposing Factors for Dystocia

Calf Birth Weight: It is closely related to dystocia. In Holsteins, a 1 kg increase in a calf birth weight increased the probability of dystocia by 13.0%. An elimination of this factor from the statistical model used to calculate the probability of dystocia decreased its accuracy by 20.0% [20].

Calf Sex: Male calves have more difficult births. It results directly from their bigger size and greater birth weight. In addition, gestations with male calves are longer, which also influence the risk of dystocia [21].

Cow Body Weight at Calving: In Angus breed pre-calving cow body weight was significantly but negatively correlated with dystocia. It was also the most important factor dependent on a cow in that breed [22].

Gestation Length: An increased incidence of dystocia resulting from longer gestation period was observed in beef cows (Bennett and Gregory 2001b). In Hereford and Angus breeds no significant effect of gestation length on dystocia was found [22].

Cow Body Condition During a Dry Period and at Calving: A body condition score must be optimal to ensure an easy calving. Over conditioned cows have a higher risk of dystocia and metabolic disorders in an early lactation;where as too thin heifers do not gains the appropriate body size at calving at the age of 24 months. The optimal level of body condition is considered to be 3.0–4.0 points in body condition score. The lower score indicates the energetic deficiency [23].

Cow Age at Calving: Usually younger cows have more difficult calvings, irrespective of the number of parturitions. Cow age at calving is directly related to its size which in turn influences the calf size. Smaller cows tend to give birth to smaller calves thus reducing the risk of dystocia [24].

Climate: The dystocia rate is higher in the winter than in the summer, however, the exact definition of these seasons differs. An easier access to a pasture in summer, more physical exercises, longer days and closer observation by owner in winter are suggested factors of seasonal differences. The risk of dystocia in Holsteins was 15.0% higher in winter (October–March) than in spring and summer (April–September) [25].

Cold weather (Air and wind chill temperatures of approximately -5 and -10 °C, respectively) during the last trimester has been associated with increased dry matter intake, increased thyroid hormone concentration,

increased blood and nutrient flow to the uterus and increased gestation length and reduced plasma oestradiol concentrations leading to increased birth weight and dystocia [26].

Nutrition: Improper nutrition of the growing heifers is the most important factor in retarding body and pelvic growth. High feeding levels may favor dystocia especially in heifers, by excessive deposition of fat in the pelvis predisposing to difficult parturition [27]. However, too intensive administration of vitamin D during a dry period may be the reason for more dystocia in a similar way as too low administration of Ca. It is also important to administer the adequate amounts of vitamins A, D and E. The type of diet may affect the level of dystocia indirectly [28].

Management: Pregnant animals which are not exercised and are kept in close confinement are more prone to difficulties such as torsion of the uterus and inertia than those kept under natural conditions, as on pasture. Exercise increases body tone, strength and resistance and results in stronger labor contractions, less fatigue, shorter duration of parturition, less uterine inertia and prompt recovery [6].

Infection: Any infection or disease affecting the pregnant uterus and its contents may cause abortion, uterine inertia, fetal death and occasionally septic metrits of pregnancy. In severe infection of the uterus, the uterine wall may lose its tone or ability to contract-a condition resulting in incomplete dilation of the cervix and uterine inertia [6].

Exercise: Increased muscle tone in heifers and cows can lead to easier calving. Forced exercise consisting on walking 1 mile per day for 4 weeks prior to calving has been shown to improve the calving ease of closely confined dairy heifers These heifers showed improved calving ease score, reduced placenta retention time and less days open following calving. Many beef heifers are grown and developed in semi-confinement dry lot conditions similar to dairy operations. Where this is the management system, it is possible that heifers could benefit from increased exercise prior to calving [29].

Genetics: Also influences the incidence of feto-maternal disproportion in cattle. Beef cows experience significantly more dystocia than dairy cows. It was demonstrated that the existence of differences in pelvic size among different breeds that seemed to be due to differences in cow body weight, although a tendency for larger pelvic openings in larger cows was found. The pelvic width is influenced by breed, determined dystocia rate to a large extent. Hereford cows had the smallest pelvic height, width and area, whereas Braunvieh had the largest pelvic width and Charolais the largest pelvic height and area [20].

Epidemiology of Dystocia: Dystocia is much more common in primpara than in pluripara. The incidence of dystocia is greater in pregnancies that terminate early due to uterine disease, fetal death and twinning or that terminates after a prolonged gestation period due to execessive size of the fetus. Its incidence in various species is not satisfactorily recorded. Williams indicated that the incidence in cattle was about 3.3 percent. It is apparently higher in dairy than beef cattle. In addition, consideration must always be given to the effect of breed, age and parity in the interpretation of results. The incidence of dystocia appears higher in the larger breeds, such as the Holstein, Brown Swissand Hereford [6].

Table 2: Influence of twins, calf sex, parity and breed of sire and dam on the frequency of dystocia in cattle

Factor	Category	Total number of calving	% Easy calving	% of difficult calving
Twinning	Twins	73	13.7	4.1
	Singles	4296	5.2	3.4
Parity	Primparous	667	14.1	12.3
	Pluriparous	3702	3.8	1.8
Sex of calf	Male	2065	6.1	4.5
	Female	2083	4.4	2.2
Breed of dam	Hereford	1186	4.0	2.4
	Limousine	264	4.2	1.1
	Charolais	284	6.0	3.2
	Simmental	354	11.6	6.5
Breed of sire	Hereford	1056	4.3	2.9
	Limousine	1236	4.9	2.4
	Charolais	896	5.6	3.3
	Simmental	729	8.8	6.2

(Source: McDermott *et al*. [30]. (These data was obtained from 123 cow calf herds in Ontario)

Management and Treatment of Dystocia

Calving Intervention and Supervision: Producers need to consider both genetics and management in attempts to reduce dystocia. Management advice would include mating heifers so that they calve earlier in the season than cows, so that they can be given extra attention and feeding cows properly through consideration of nutrient requirements and condition scores. In addition, producers should know when and how to give assistance and when a veterinarian should be called [14].

The vast majority of cows will happily calve unattended and unassisted and where possible should be allowed to do so. However, a small proportion of cows and a greaterproportion of heifers may require assistance. Three simple questions need to be addressed by herd personnel to ensure successful calving intervention: whether or when to intervene, how to intervene and when to solicit veterinary assistance. Good supervision is dependent upon monitoring calving, particularly stage two and intervening if and where necessary, while avoiding excessive direct supervision. The continuous presence of an observer during stage two of calving has been associated with an increase in calving problems and assisted deliveries [4].

Regular observations are required to determine the progress of labor and when and how to provide assistance or seek for help from a veterinarian. As a rule of thumb, normal delivery should be completed within 2 hours after the water bag appears. If not, the calf may be born dead or in a weakened condition. Observing cows in labor at 30-minute intervals will provide information about whether the calving is progressing normally or not. Cows should be provided assistance if they have not delivered the calf within 2 hours from the time the water bag appears, or if more than 30 minutes elapse without progress [29].

Medical Management: The use of specific ecobolic drugs such as oxytocin, calcium or glucose therapy may be required in cases where a deficiency is suspected. For the case of uterine torsion, antibiotic and non steroidal anti-inflammatory drugs are provided [31]. Prostaglandin F-2alpha and its analogs are used mainly for their luteolytic effects to induce predictable onset of estrus in a variety of species. They cause marked uterine contractions which may be useful for expulsion of uterine contents [11].

A deficiency of estrogen is considered to be one important cause of failure of cervical dilation hence, injection of estrogens like estradiol valerate 20–30milligrams intramuscularly can be helpful and however, estrogen should be given with care in a completely closed cervix because of the dangers of uterine rupture that may follow because of violent contractions. Likewise, injections of oxytocin 20 - 40 international units, intravenously or intramuscular can be given to promote uterine contraction to effect cervical dilation when it is partially dilated [9].

Obstetrical Operations to Relieve Dystocia: In handling dystocia there are numerous operations or procedures that the veterinarian should be able to perform or use. The principal purpose of obstetrical operations is to deliver a viable fetus and to prevent injury to the dam. The obstetrical operations may be divided into four major classifications: mutation, forced extraction, fetotomy or embryotomy and cesarean section or laparohysterectomy [8].

Mutation: Is defined as those operations by which a fetus is returned to a normal presentation, position and posture by repulsion, rotation, version and adjustment or extension of the extremities. Normal birth will proceed in uniparous animals only with the fetus in anterior or posterior longitudinal presentation, dorso-sacral position and with the head and neck and limbs extended. Most multipara can have a normal birth with the fetal limbs folded alongside of or beneath the body, since the limbs are small and flexible. In multipara, fetuses may be in a dorso-illial or dorso-pubic position and be born without difficulty [6].

Forced extraction/traction: The withdrawal of foetus from birth canal of the dam by application of force is called forced traction. Such a force may be developed by cords, hooks and forceps. Lubrication of the genitalia is important for forced traction [13]. A very important consideration is the magnitude of the supplementary force which may be used, since excessive force inappropriately applied can cause severe trauma to the dam and fetus [7].

Fetotomy: It is sectioning of a fetus into two or more parts within the uterus and vagina. Its purpose is to reduce the size such that delivery through the birth canal becomes possible [7].Fetotomy should be considered only when the fetus is known to be died. By using the instrument called embryotome or fetotome, the fetus in anterior presentation first remove the head, then the foreleg and also remove the thorax and finally division of the pelvis [3].

Hysterectomy or Caesarian Section: The delivery of the foetus usually at parturition by laparohysterotomy is called caesarean section [13]. The cesarean operation is a routine obstetric procedure in cattle practice which has high maternal and fetal survival rates and is less exhausting, speedier and safer than fetotomy. The need for urgent intervention is indicated if there is evidence of fetal hypoxia as shown by hyperactive movements of the fetus expulsion of meconium, identifiable in the amniotic fluid [7].

The indications for this operation are for delivering the foetus when normal delivery is difficult or not desirable. Paravertebral or lumbar epidural anesthesia is recommended in the recumbent state. There are many sites for this operation: between the mammary vein and the midline, oblique flank incision, downward and forward from a little below external angle of ilium, vertical incision in the paralumbar fossa (Preferably of the left side to avoid the omentum and intestines. Analysis of published cases shows that the following six major indications account cumulatively for 90% of all caesarean operations: fetomaternal or fetopelvic disproportion (Either relative or absolute fetal oversize); incomplete dilatation of the cervix; uterine torsion that cannot be corrected otherwise; fetal monsters; faulty fetal disposition (Presentation, position or posture); fetal emphysema [32].

The options of patient positioning for caesarean operation are; standing (Suitable for left or right paralumbar fossa and lateral oblique approach); dorsal recumbency (Suitable for ventral midline and paramedian approach); sternal recumbency (Suitable for left or right paralumbar fossa); lateral recumbency (suitable for ventrolateral and low-flank approach). The choice depends on the surgeons' preference, demeanour of the animal, as well as available facilities. In a cow capable of tolerating surgery while standing, the left paralumbar fossa or flank approach is the standard technique for a viable or recently dead, uncontaminated fetus [33].

Economic Significance of Dystocia

Direct Losses: Of the many factors affecting calf survival, dystocia is the most important [5]. Dystocia results in death of calves and cows, production losses in both dam and calf and delayed reproduction rates [34]. Of all preweaning deaths, 45.9% can be attributed to dystocia. In one study of certain California dairies, dystocia was responsible for 6.4% of all cow deaths and 24% of deaths of first-calf heifers [5]. Dystocia may cause prolonged hypoxia and acidosis, which, if not resulting in the death of the full-term foetus, may result in weakness and prolonged recumbency after delivery. This may reduce colostral immunoglobulin intake, resulting in an increased short to medium-term mortality rate. In addition, forces exerted on the foetus during delivery may cause cardiopulmonary malfunction. All these factors will reduce the likelihood of survival of the neonate [35].

Indirect Losses: In a study of beef animals, it was found that prolonged parturition resulted in a slightly delayed onset of oestrus post-calving, slightly more services/conception and reduced subsequent conception rate. This effect was particularly pronounced in heifers [36]. Bovine dystocia is associated with a higher incidence of retained foetal membranes, uterine disease (Endometritis, metritis, pyometra, uterine rupture) and periparturient hypocalcaemia in the cow, Mee [4].

Prevention of Dystocia: Veterinarians should exercise good husbandry practices; attempting to ensure that the size of the birth canal is adequate; the selection of sires that result in low dystocia frequency due to feto- maternal disproportion has been recognized for many years, as illustrated by the use of breeds such as the Angus and Hereford as sires for dairy heifers [7].

Early intervention minimizes the effects of dystocia on calves. Heifers should be monitored regularly and provided with assistance promptly if stage II labor is prolonged. Producers must be well trained to intervene appropriately in dystocia and recognize when to call the veterinarian. A balanced nutritional program helps control losses associated with mineral deficiency [31].

If calving difficulty is a problem in your herd, feed heifers well enough to weigh at least 85% of their expected mature weight at first calving [14]. Maintenance of calcium homeostasis throughout transition is imperative for uterine health [37, 38]. The use of anionic salts can reduce the incidence of clinical hypocalcaemia (Milk fever) to <2% in multiparous cows and also reduce the incidence of subclinical hypocalcaemia in early postpartum [37].

CONCLUSION

A condition of difficulty in calving in the cow or inability to expel fetuses through the birth canal by its own effort is termed as dystocia. It has been caused by maternal and fetal factors. The maternal factors are: feto-maternal disproportion, incomplete cervical dilation, uterine torsion, uterine inertia and hernia. Among the fetal factors: fetal oversize, maldispositions and twin

gestations are the important causes of dystocia. The cow with difficulty in calving may show prolonged, non-progressive first stage labour and mild discomfort. It may also adopt a rocking horse stance and show mild colic pain. The diagnosis of dystocia is based on the history of the case, general clinical examination of the cow and specific examinations like vaginal and rectal examinations. The diagnosis and treatment of dystocia constitute a large and important part of the science of obstetrics and require a good understanding of normal parturition. Some factors such as genetics, calf birth weight, calf sex, nutrition, cow body weight at calving, gestation length, cow body conditionand cow age at calving are closely related to dystocia. Dystocia is most commonly occurring in primpara, heifers and larger breeds. Obstetrical operations such as mutation, forced traction, fetotomy and cesarean section are used to relieve dystocia. A specific ecobolic drugs like oxytocin and prostaglandins are used to cause a marked uterine contractions as to expel uterine contents. Occurrence of dystocia on the dairy farms was strongly associated with increased morbidity and mortality of newborn calves and loss of the dam. Producers must be well trained to intervene appropriately in dystocia and recognize when to call a veterinarian. Early intervention and maintenance of balanced nutritional program also minimizes the effect of dystocia. Therefore, based on the above conclusion the following points can be forwarded as a recommendation.

- Education of producers and farm owners on the management and in strategies to reduce dystocia and its effect on calves should be a priority.
- Appropriate feeding management and exercise should be accustomed by cattle rearing groups
- Producers should know when and how to give assistance and when a veterinarian should be called.
- At the national level, genetic selection programmes with adequate weighting for calving ease is recommended.

REFERENCES

1. Rao, R.A., 1989. Reproductive problems in cattle and buffaloes. In: Bhat P.N., Menon, K.K.G., Srivastava, H.C.(eds): Animal productivity. New Delhi, Oxford and IBH publishing co. pvt. ltd., pp: 225-231.
2. Ball, P.J.H. and A.R. Peters, 2004. Reproduction in cattle. 3rd ed. Blackwell publishing Ltd., Oxford, UK; Ames, Iowa, pp: 242.
3. Jackson, P.G.G., 2004. Handbook of Veterinary Obstetrics. 2nd ed. W.B. Saunders Elsevier Philadelphia, pp: 2-80.
4. Mee, J.F., 2008. Managing the cow at calving times. Irish Veterinary Journal, 41: 35-41.
5. Bellows, R.A., D.J. Patterson, P.J. Burfening and D.A. Phelps, 1987. Occurence of neonatal and postnatal mortality in large beef cattle II. Factors Contributing to Calf Death, 9: 195-219.
6. Roberts, S.J., 2004. Veterinary Obstetrics and Genital disease. 2nded. New Delhi: CBS Publishers and Distributors, pp: 227-299.
7. Noakes, D.E., T.J. Parkinson and G.C.W. England, 2001. Arthur's Veterinary Reproduction and Obstetrics. 8th ed. London. Saunders. Elsevier, pp: 205-297.
8. Benesch, F. and J.G. Wright, 2001. Veterinary Obstetrics. India: Greenworld publishers, Pp.75-191.
9. Purohit, G.N., Y. Barolia, C. Shekhar and P. Kumar, 2011. Maternal dystocia in cows and buffaloes: a review. Open Journal of Animal sciences, 1(2): 41-53.
10. Sane, C.R., S.N. Luktuke and B.R. Deshpande, 1982. Reproduction in Farm Animals. Varghese Publishing House, Bombay, India.
11. Beagley, J.C., K.J. Whitman, K.E. Baptiste and J. Scherzer, 2010. Physiology and treatment of retained fetal membranes in cattle. Journal of Veterinary Internal Medicine, 24:261-268.
12. Houghton, P.L. and L.R. Corah, 1989. Calving difficulty in beef cattle: a review cooperate extension service. Kansas State University, Manhattan, Kansas State, pp: 1-9.
13. Kumar, P., 2009. Applied Veterinary Gynaecology and Obstetrics, International Book Distributing Co., pp: 132-189.
14. Anderson, P., 2012. Minimizing calving difficulty in beef cattle. Proceedings: Minnesota Beef Cattle Improvement, MN, USA. Association Annual Beef Cattle Conference, 21: 1-15.
15. Honparkhe, M., A. Kumar and V.K. Gandotra, 2003. Dystocia due to accumulation of fluid in peritoneal cavity and intestines of fetus in a cross bred cow. Indian Journal of Animal Reproduction, 24: 83-84.
16. Jackson, P.G.G., 1995. Hand-book of veterinary obstetrics. W.B. Saunders Elsevier Co. Ltd., Philadelphia, pp: 30-69.
17. Momont, H., 2005. Bovine reproductive emergencies. Veterinary Clinic, North America. Food Animal Practices, 21(3): 711-27.
18. Kolkman, I., S. De Vliegher, G. Hoflack and M. Van Aert, 2007. Protocol of the Caesarean section as performed in daily bovine practice in Belgium. Reproduction in Domestic Animals, 42(6): 583-9.

19. Youngquist, R.S. and W.R. Threlfall, 2007. Current therapy in large animal theriogenology. 2nd ed. Saunders, Elsevier. St. Louis, Missouri, pp: 310-333.
20. Zaborski, D., W. Grzesiak, I. Szatkowska, A. Dybus, M. Muszynska and M. Jedrzejczak, 2009. Factors affecting dystocia in cattle. Reproduction in Domestic Animals, 44: 540-551.
21. Heins, B.J., L.B. Hansen and A.J. Seykora, 2006. Calving difficulty and stillbirths of pure Holsteins versus crossbreds of Holstein with Normande, Montbeliarde and Scandinavian Red. Journal of Dairy Science, 89: 2805-2810.
22. Bellows, D.S., S.L. Ott and R.A. Bellows, 2002. Review: Cost of reproductive disease and conditions in cattle. Professional Animal Science, 18: 26-32.
23. Schroeder, U.J. and R. Staufenbiel, 2006. Invited review: methods to determine body fat reserves in the dairy cow with special regard to ultrasonographic measurement of backfat thickness. Journal of Dairy Science, 89: 1-14.
24. Berger, P.J., A.C. Cubas, K.J. Koehler and M.H. Healey, 1992. Factors affecting dystocia and early calf mortality in Angus cows and heifers. Journal of Animal Science, 70: 1775.
25. Johanson, J.M. and P.J. Berger, 2003. Birth weight as a predictor of calving ease and perinatal mortality in Holstein cattle. Journal of Dairy Science, 86: 3745-3755.
26. McClintock, S.E., 2004. A genetic evaluation of dystocia in Australian Holstein-Friesian cattle. PhD, University of Melbourne.
27. Laster, D.B., H.A. Glimp, L.V. Cundiff and K.E. Gregory, 2009. Factors affecting dystocia and effects of health disorders on feed intake and milk production in dairy cows. Journal of dairy science, 92: 2580-2588.
28. Correa, M.T., C.R. Curtis, H.N. Erb, J.M. Scarlett and R.D. Smith, 1990. An ecological analysis of risk factors for postpartum disorders of Holstein-Friesian cows from thirty-two New York Farms. Journal of Dairy Science, 73: 1515-1524.
29. Cooke, R., A. Villroel and C. Estill, 2008. Calving School Handbook, Beef cattle sciences, Oregon State University, 2nd ed., pp:12-27.
30. McDermott, J., O. A llen, S. Wayne Martin and D. Alves, 1992. Patterns of stillbirth and dystocia in Ontario cow-calf herds. Canadian Journal of Veterinary Research, 56: 47-55.
31. Kahn, M.C., 2005. The Merck veterinary manual. 9th ed., Washington. Gary zelko, pp: 1753-2032.
32. Venugopalan, A., 2009. Essentials of Veterinary Surgery. 8thed. New Delhi: Oxford and IBH publishing company, pp: 495-496.
33. Vermunt, J.J., 2008. The cesarean operation in cattle: a review. Iranian Journal of Veterinary Surgery, 1: 82-99.
34. Dematawewa, C.M.B. and P.J. Berger, 1997. Effects of dystocia on yield, fertility and cow losses and an economic evaluation of dystocia scores for Holsteins. Journal of Dairy Science, 80: 754.
35. Lombard, J.E., F.B. Garry, S.M. Tomlinson and L.P. Garber, 2007. Impacts of dystocia on health and survival of dairy c alves. Journal of Dairy Science, 90: 1751-1760.
36. Doornbos, D.E., R.A. Bellows, P.J. Burfening and B.W. Knapp, 1984. Effects of dam age, prepartum nutrition and duration of labor on productivity and postpartum reproduction in beef females. Journal of Animal Science, 59: 1-10.
37. Goff, J.P. and R.L. Horst, 1997. Physiological changes at parturition and their relationship to metabolic disorders. Journal of Dairy Science, 80: 1260-1268.
38. Martinez, N., C.A. Risco, F.S. Lima, R.S. Bisinotto, L.F. Greco, F. Maunsell, K.N. Galvão and J.E. Santos, 2012. Evaluation of per partum calcium status, energetic profile and neutrophil function in dairy cows at low or high risk of developing uterine disease. Journal of Dairy Science, 95: 7158-7172.