
DYSTOCIA IN A PRIMIGRAVIDA HEIFER: A CASE REPORT

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ABSTRACT

This paper is a case report of a primigravida heifer found dead within the precinct of the cattle kraal of the Teaching and Research Farm of the Federal University of Technology, Akure, Nigeria. The animal was opened up to ascertain the probable root causes of its death. The underlying causes of the death of this heifer and the intervention strategies needed to prevent such an occurrence amongst our cattle population are reported here.

Keywords: Cattle, Dystocia, Economic loss, Heifer, Primigravida, Tenesmus

INTRODUCTION

The economic importance of dystocia among cattle population cannot be over-emphasized. This is a truism if its prevalence among heifers put around 10 to 15 % and among other cattle population at around 3 to 5 % (McClintock, 2004; Frame, 2006) is taken into consideration. With the cattle population in Nigeria at 19 million heads (NAN, 2015) and globally at 971.4826 million heads (Cook, 2016), the losses resulting from dystocia among the heifers and other cattle population are simply colossal. In fact, the economic costs of dystocia are four times greater than its treatment costs (Mee, 2012), while dystocia in confined cows account for 41 % of production costs, 34 % of fertility costs and 25 % of cow and calf morbidity and mortality costs excluding costs associated with increased culling, veterinary costs and other management costs (Anderson, 2012).

The root causes of dystocia have been variously debated. The first school of thought is that dystocia is often of maternal origin, while the second school of thought put the blame on the foetus itself.

A midline opinion ascribes the prevalence of dystocia to both maternal and foetal causes. Maternal causes of dystocia include but are not limited to the following: uterine torsion, improper vaginal dilation, ring womb, uterine inertia and neoplasm of the vulva, vagina and uterus (Purohit *et al.*, 2011). Foetal dystocia may result from mal-presentation of the foetus, conjoined foetuses, over-size foetus, foetal displacement, foetal monstrosity, mummified foetus, macerated foetus and foetal abnormalities like hydrocephalus, foetal ascites, anasarca and cleft palate (Purohit *et al.*, 2013). Dystocia of foeto-maternal origin is caused by factors like foeto-pelvic disproportion, in which the foetus may be too large as to impede its passage through the birth canal or the pelvis of the dam may be too narrow as to permit easy expulsion of the foetus during parturition. The combination of the two will ultimately result in difficult parturition. This present case is discussed along these different shades of reasons and opinions in order to establish its remote and immediate causes and thus proffer possible preventive and intervention strategies against future occurrence.

CASE PRESENTATION

A primigravida heifer was found straining in the early hours of Tuesday 6th October 2015 close to the kraal of the Teaching and Research Farm, Federal University of Technology, Akure, Nigeria by one of the cattle attendants. It died four hours later following intense straining and bellowing (before the intervention of livestock officials). Dystocia was implicated as the probable cause of death of the gravid heifer. On gross examination of the carcass, there were tell-tale signs of tenesmus such as prolapse of both the rectum and vagina and tumescence of the vulva. To verify this probable cause of death, the animal was opened up ventrally to examine the foetus in situ (Figure 1). This post mortem invasive examination revealed a classical breech presentation with the two hind limbs in anterior flexion directed towards the anterior aspect of the dam (Figure 2). The foetal age was put at between 7½ to 8 months as observed from the incomplete keratinization /ossification of the hooves/phalanges while the dam's age was about 18 months. The foetal weight taken upon excision from its dam was 20 kg. Many underlying causes like nutrition, type of management, genetics, season of the year and foeto-maternal disproportion have been proffered as reasons for this type of dystocia. It is advisable that all these underlying causes should be modulated in order to prevent the incidence of dystocia and its attendant economic losses among cattle population.

DISCUSSION

The post-mortem examination of the dam and calf revealed the following risk factors that might have provoked this classic case of dystocia in the Teaching and Research Farm (Livestock Section) of the Federal University of Technology, Akure (FUTA), Nigeria.

Over-sized Foetus: The weight of the foetus upon its excision from its dam was 20 kg at an estimated age of between 7½ - 8 months. Within this age bracket, bovine foetuses have the capacity to add 0.3 – 0.4 kg daily (Meijering, 1984). This daily weight gain would have put

the foetus at an average weight of about 37 kg at full term – a birth weight considered dangerously large for a primipara of the White Fulani (Bunaji) breed.

The average birth weight of the Bunaji breed obtained at the University of Ibadan, Nigeria between 1980 and 1990 was 24.54 kg (Olawumi and Salako, 2011). It has been found that over-sized calf weight accounts for 50 % of the phenotypic variance in dystocia (Assan, 2013) and that the odds of dystocia is aggravated by 13 % increase in birth weight (Johanson and Berger, 2003).

Precocious Mating: This reported case of dystocia involved a primigravida of about 18 months old. The heifer was probably mated at about 10 months of age, a rather precocious mating resulting from indiscriminate breeding in the herd. The system of herd management in FUTA is semi-intensive in nature in which the animals are led out daily to graze before being returned to their kraal to pass out the night. This system encourages indiscriminate mating between the male and female cattle in the herd. Effective pelvic area that will permit ease of calving is directly related with the age of the dam. An underage dam as the case in question will have a pelvic area that is disproportional to the foetal size. Since the probability of dystocia is a function of both the pelvic area and the size or birth weight of the foetus (Mee, 2012), the introduction of young heifers prematurely into the breeding herd could therefore increase the incidence of dystocia.

Mal-position of the Foetus in the Uterus:

Mal-position of the foetus may take many forms which include posterior presentation, breech presentation, foreleg mal-posture or cranial mal-posture (Mee, 2012). The particular case of dystocia being reported here showed a longitudinal posterior presentation in which the hind limbs were in anterior flexion and both directed towards the anterior aspect of the dam (Figures 1 and 2).

This presentation would definitely increase the precariousness of birth when coupled with over-size foetus and precocious mating earlier mentioned.

Mal-presented calves like this have a two-time higher risk of dystocia and a five-time higher risk of stillbirth (Anderson, 2012).



Figure 1: Longitudinal posterior presentation and dorsal positioning of the foetus showing the anterior flexion of the hind limbs within the foetal envelopes (A)



Figure 2: Longitudinal posterior presentation and dorsal positioning of the foetus with the hind limbs now out of the foetal envelopes



Figure 3: Lateral view of the in situ presentation of the foetus. Note the gender of the foetus and the carpal flexion (B)

The Sex of the Foetus: The sex of the foetus is also very often implicated as one of the high risk factors of dystocia. Reports in the literature revealed that male foetuses are usually larger than female foetuses (Olawumi and Salako, 2011). The longer duration of male foetuses *in utero* and the resultant overall increase in weight gain at parturition accounts for this weight differential at birth between the male and female calves. Male foetuses have a higher risk of dystocia than female foetuses (Lombard *et al.* (2007), also the birth weight of male calves, singleton calves and calves from older cows are greater than those of female calves, twins and calves from heifers (Atashi *et al.*, 2012). The calf under our reportage is a male (Figure 3) that weighed 20 kg upon its removal from its dam. Its gender would have contributed in one way or the other to the difficult parturition that was experienced.

The Breed of the Dam: This case of dystocia involved a White Fulani breed (Figure 4). Breed or genotype accounts for about 60 % variation in birth weight (McClintock, 2004). Such increase in birth weight with a concomitant increase in gestational length could aggravate the problem of dystocia at term. In fact, a high prevalence of dystocia has been established in the Holstein breed of cattle. That is why the increased prevalence of dystocia being experienced among Swedish cattle population (Steinbock, 2006) and Danish cattle (Hansen *et al.*, 2004) has been attributed to Holstenization of the Freisian breed in these two European countries by the Holstein breed of North America. There is dearth of information concerning the incidence of dystocia among the White Fulani breed of cattle in comparison with other Zebu breeds. However, since this breed represents one of the largest African zebu breed, it may have latent effects on its birth weight and hence on its ease of parturition. Significant differences in the birth weight of Brown Swiss, Hosltein and Freisian breed of cattle was earlier reported (Manzi *et al.*, (2012).

Inability of the Cervix and Vulva to Dilate: This is one of the high risk factors of dystocia in cattle particularly among heifers and older cows

(Anderson, 2012). So many factors are implicated in these conditions such as confinement and periparturient environmental stress, premature assistance, hormonal asynchrony and preterm calving (Anderson, 2012). Disturbance of the dam during stage 1 labour such as change of the site of parturition from one location to the other may obstruct the dilation of the cervix and vulva thus provoking dystocia (Carrier *et al.*, 2006). This case report could probably have been caused by a combination of factors but as can be inferred from Figures 4 and 5, the prolapse of the vagina and non-dilation of the vulva were quite evident. This actually led credence to the assertion (Anderson, 2012) that incomplete dilation of the vulva is a common occurrence among heifers. The heifer must have undergone intense straining due to non-dilation of the vulva that also caused the prolapse of the rectum through the anus (Figures 4 and 5).

Pathological Enlargement: It is highly probable that this foetus died *in utero*. In such a situation, pathological enlargement might have taken place in the foetus as occasioned by prolonged dystocia and the eventual death of the foetus *in utero*. The resultant emphysema must have increased the volume of the dead foetus relative to the pelvic area of the dam and thus complicate eutocia. The evidence of emphysema and anasarca possibly due to heat and bacteria invasion of the foetus (Steinbock, 2006) can be seen from the grossly swollen left foreleg (Figure 6).

Conclusion: This report is a complicated case of dystocia from different underlying causes. These range from management, nutritional, foetal, maternal, gender to genotypic causes. All these causes have been fingered in one way or the other either singly or variously to undermine the normal birth of the calf. The intervention strategy that should be put in place to forestall future occurrence of dystocia of this kind in any herd or flock would therefore include how these underlying causes could be modulated in order to safeguard the health and general wellbeing of our stock.



Figure 4: The ano-genital area of the dam showing prolapse of the rectum and vagina



Figure 5: A closer look at the ano-genital area of the dam with evidence of prolapse of the rectum and vagina (tenesmus)



Figure 6: The intact foetus as excised from its dam showing gross postural defects (bilateral flexion of the hind limbs, carpal flexion around the head and the grossly swollen forelimb (C))

Such intervention as encapsulated in efficient large animal management that will forestall indiscriminate breeding is suggested as a possible remedy to problems of dystocia. Also,

the use of ultrasound and other assisted reproductive technologies (ART) to monitor gravid heifers and cows and hence predict cases of dystocia at full term or near full term could be put in place to checkmate its incidence among cattle population.

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