

Achondroplasia in buffalo, cow and ewe

V. Devi Prasad*, P. Ravi Kumar, N.V.V. Hari Krishna, M. Raghunath and D. Bhagya Raju

Department of Veterinary Surgery and Radiology, NTR College of veterinary science, Gannavaram, Krishna District, Andhra Pradesh, India 521102.

*Corresponding Author: Email: professorprasad@yahoo.com

Journal of Livestock Science (ISSN online 2277-6214) 7: 211-214

Received on 29/6/2016; Accepted on 7/8/2016

Abstract

Achondroplasia is one of the rare congenital anomalies seen in farm animals of India. This anomaly has been recorded in three different occasions i.e. in a cow, a she buffalo and a ewe. There were a few differences in the morphology of these young ones. All the three were delivered through caesarean section and were dead at the time of surgery. This defect is supposed to be inherited and hence, both the sire and dam involved must be prevented from breeding.

Key words: bull dog calf; achondroplasia; congenital anomaly.

Introduction

Monstrosities are associated with either infectious disease or congenital defects (Arthur *et al.*, 2001). Congenital anomalies like achondroplasia are occasionally reported in farm animals. There are several anomalies which cannot be treated and this inadvertently results in loss of calf crop. Achondroplasia is a condition, in which there is defective osteogenesis resulting in anomalous forms of development. Bulldog calf is one among them which is rarely being reported in India.

The phenotypical variation of achondrodysplasia is wide, ranging from lethal foetal disorders through semi lethal cases to short-legged viable animals (Agerholm *et al.*, 2004). Incidence of achondrodysplasia is very rare in animals (Noakes *et al.*, 2001). Among various forms of achondrodysplasia, bulldog calf is occasionally reported. It has been reported in cattle (Roberts, 2004 and Bhattacharya *et al.*, 2012) buffaloes (Christopher, 2000) but not in sheep. In the present paper, achondroplasia, a congenital anomaly has been presented in three species viz. a cow, buffalo and a ewe.

Materials and methods

A cow aged about 9 years, a she buffalo aged about 11 years and a ewe aged about 3 years were presented to the clinic at different times, with a history of being unable to deliver young ones. All the three animals completed the gestation period. The first water bag ruptured 18, 20 and 26 hours prior to the time of presentation in the cow, she buffalo and the ewe respectively. Before they were brought, manual traction was tried locally by the para veterinarians, without any result. They were given induction doses of prostaglandins, oxytocin, valethamate bromide, Calcium magnesium borogluconate and dextrose normal saline, so as to facilitate normal parturition. The process of parturition stalled after the rupture of first waster bag. As there were no progressive signs of parturition, they were brought for caesarean section. All the three animals were subjected for caesarean section following standard procedure through left ventro-lateral oblique incision under local analgesia.

Results and Discussion

The young ones were found abnormally developed with features of bulldog calf. The common features in the three offspring were compression of skull, short and broad head known as brachycephaly (Fig 1). The face in the buffalo calf presented more distortion with widened nasal, maxillary and lacrimal bones. The frontal and occipital bones were predominantly bulging. The nostrils had abnormal conformation. There was a slit like passage above the left nostril (Fig 2). The abdomen was relatively voluminous with short and stumpy legs (Fig 3). The appearance of the head was similar in the lamb. But the legs were comparatively and proportionately lengthier in their size when compared to those in buffalo and cow calves (Fig 4). The integument was found fully developed in all the three young ones. All the three were thought to have died intrauterine a few hours before surgery, as there were no signs of emphysema or putrefaction of the foetus. It is worth mentioning here, that the cow was inseminated with HF x O semen while the buffalo and the ewe were mated to the local sires.

Foetal monsters inadvertently lead to dystocia in farm animals. The accidents of gestation can be identified in small animals like dogs and this is not at all possible in large animals. Hence, the foetal causes like monsters cannot be identified during the gestation period and are diagnosed only after the due date of parturition. Conditions that are inherited such as achondroplastic calves are reported only from the clinicians in academics. Perhaps, this could be the reason for the veterinarians for being unable to arrive at statistical figures correctly for such incidences. In India, congenital anomalies like achondroplasia are less frequently reported. To the knowledge of the authors, there are a very few reports in cattle and buffaloes while nil in sheep.

In the present study, all the three animals carried the foetuses up to the complete gestation period. The development of the foetuses was near normal as indicated by the normal hair coat. Similar to the present findings, Wani *et al.* (2015) also documented normal gestation period, and full development of the foetal body except head. However, contrary to this finding, many researchers like Cavanagh *et al.* (2007) reported that, abortion of the bulldog calf often occurs at 7 months of gestation.

Descriptions of different phenotypes in several cattle breeds across various geographic regions have been published (Huston *et al.* 2000). The severity of presentation is highly variable, but in general calves are born with a shortened stature, and deformity of the head, spine, and limbs (Gentele and Testoni, 2006 and Cavanagh *et al.* 2007). The symptoms observed were more or less similar to those described by others, except for the comparatively long and slender legs in the lamb. However, the features like, protruded tongue, herniation, cleft palate etc. observed by Moura *et al.* (2014) in Nellore bulldog calf were not observed in these three young ones. Because development of tissues and organs is interdependent, it is not uncommon for more than one anomaly to appear in an animal (Newman *et al.*, 1999).



Fig 1: Bull dog calf - Cow



Fig 2: Bull dog calf - Buffalo



Fig 3: Note disproportionate body and limbs



Fig 4: Bulldog calf lamb

The cause of anomalous development may occasionally be obvious but mostly it is obscure, because of its multifactorial nature. Identification of the aetiology of developmental defects is often extremely difficult for many reasons. Defective development alone often does not give a clue to the cause of anomaly (Rousseaux and Ribble, 1988). Researchers have attributed various genetic causes for the development of achondroplasia. In order to establish a cause and effect relationship, we need to have pedigree records for each of the animal involved in breeding. But most of the times, records indicating the parentage are not available for the livestock maintained by individual farmers. Diagnosing the cause of bovine congenital malformations (BCMs) is challenging for bovine veterinary practitioners and laboratory diagnosticians as many known as well as a large number of not-yet reported syndromes exist (Agerholm et al., 2015). However, it can be asserted that, there could be hereditary causes which might have resulted in the development of these achondroplastic young ones. As suggested by (Simon et al., 2010), the owners of these animals were advised to keep them away from further breeding.

References

- 1) Agerholm JS, Arnbjerg J and Andersen O, 2015. Familial achondrodysplasia in Holstein calves. *Acta Veterinaria Scandinavica (2015) 57:54*
- 2) Agerholm JS, Hewicker MT, Peperkamp K and Windsor PA 2004. Virus-induced congenital malformations in cattle. *Journal of Veterinary Diagnostic Investigation 16:293–298 (2004).*
- 3) Arthur GH, Noakes DE, Pearson H and Parkinson TJ 2001. *Veterinary Reproduction and Obstetrics*, 8th ed. W.B. Saunders Co.Ltd., London. 118p.
- 4) Bhattacharya HK, Buchoo BA and Fazili MR 2012. Bulldog Calf: A Case Report. *Asian Journal of Animal Sciences, 6: 97-99.*
- 5) Cavanagh CAL, Tammen I, Peter A, Windsor, John F, Bateman, Savarirayan R, Nicholas FW and Raadsma HW 2007. Dwarfism in Dexter cattle is caused by mutations in ACAN Mammalian Genome 18:808.
- 6) Christopher KJ, 2000. Some developmental abnormalities in buffalo. *Buffalo Bulletin, 19: 64-66.*
- 7) Gentile A and Testoni S, 2006. Inherited disorders of cattle. A selected review. *Slovenian Veterinary Research, 43: 17-29.*
- 8) Huston K, Saperstein G, Steffen D, 2000. Clinical, pathological and other visible traits loci except coat colour. *In: Mendelian inheritance in cattle 2000*, ed. Millar P, Lauvergne JJ, Dolling C, pp. 243–262. EAAP Publication No. 101. Wageningen Pers, Wageningen, The Netherlands.
- 9) Moura E, Prado AMRB, Pimpao CT, Murakami CT and Ribeiro DR 2014. Genetic and pathoanatomical features of bovine prenatal lethal chondrodysplasia. *Hereditary Genetics 3: 3.*
- 10) Newman TL, Bailey JC, Jones WA, DiGrassie WD and Whittier, 1999. Multiple congenital anomalies in a calf. *Journal of Veterinary Diagnostic Investigation 11:368–371.*
- 11) Noakes DE, Parkinson TJ and England GCW, 2001. *Arthur's Veterinary Reproduction and Obstetrics*. 8th Edn., Harcourt Private Limited, New Delhi, India, Pages: 868.
- 12) Roberts SJ, 2004. *Veterinary Obstetrics and Genital Diseases (Theriogenology)*. 2nd Edition. Indian Print CBS Publishers, New Delhi, India.
- 13) Rousseaux and Ribble 1988. Developmental anomalies in farm animals II. Defining aetiology. *Canadian Veterinary Journal, 29: 30-40.*
- 14) Simon S, Justin William MB, Rao GD, Sivashanker R and Suresh Kumar R 2010. Congenital Malformations in ruminants and its surgical management. *Veterinary World 3(3):118-119*
- 15) Wani AA, Tawheed S, Shafi and Chowdhary RA 2015. Dystocia due to a bulldog calf in a she buffalo. *Buffalo Bulletin 34 (2): 147.*