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Prevalence congenital defects and its body system affection in calves and kids

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Abstract

Context: Congenital defects can evolve from abnormal genetic make-up or from agents associated with the fetal environment or their interaction. The frequency of individual defect varies depending on species, breed, body system, geographic location and season. It is important to identify the causes of congenital defects and their possible solution as they hamper the economic benefit of the farm.

Objectives: The present study was conducted to identify the congenital defects and to determine its prevalence in calves and kids.

Materials and Methods: Gross observation and some physical examinations were applied for the presumptive diagnosis of congenital defects in calves and kids.

Results: Thirty-two (32) ruminants (calves 29 and kids 3) were found to be affected with different congenital anomalies from January' 2014 to June' 2014 in thirteen different selected upazila of Bangladesh. The highest number of cases were recorded in Begumganj upazila in Noakhali district which was 18.75% of the total cases. Among the different congenital malformations atresia ani (58.62%) was recorded as the most prevalent, followed by bent leg (10.34%) and dermoid cyst (10.34%). The digestive system was observed to be the most susceptible (65.52%) to congenital defects than all other systems of the body while ocular system was found to be the least susceptible (13.79%). The study also revealed that 20.69% of studied animals were prone to be affected with congenital defects in Musculo-skeletal system.

Conclusion: Different types of congenital defects involving various systems occur in ruminant where Atresia ani is the most prevalent congenital defects in calves and kids. Further experiment should be continued to explore the risk factors that leads such type of defects development and economic losses in farm animal.

Keywords: Congenital defects, Body systems, Calves, Kids

Introduction

Congenital defects can result from defective genetic make-up or from an insult or agents associated with the fetal environment or their interaction and are classified as lethal, sub-lethal or non-lethal (Leipold *et al*., 1983). The susceptibility to injurious environmental or genetic agents varies with the stage of development and between species and the susceptibility decreases with the advancement of fetal age. The frequency of individual defects varies with the species, breed, geographic location, season and other environmental factors (Rahman *et al*., 2006). The zygote is resistant to teratogens but susceptible to genetic mutation and chromosomal aberration. The embryo is highly susceptible to teratogens, but it decreases with age as the critical developmental periods of the organ or system are passed. The incidence of teratogenesis ranged from 2 to 3.5% of all birth calves, lambs and foals (Aiello, 1998). Blood (1989) mentioned that congenital malformations cause prenatal morality, decrease maternal productivity and reduces the market value of defective neonates.

Some individual reports on congenital anomalies in newborn calves and kids have been made in Bangladesh but the prevalence of available congenital defects in this country was not yet studied. Extensive studies on congentital defects in the context of current status, risk factors and their impacts on livestock production may provide the better insight into development of preventive measures and reduction of these diseases and deformities. Bearing this view in mind the present experiment was conducted to know the common congenital defects and their body system involvement in calves and kids.

Materials and methods

The study was conducted at thirteen (13) different selected upazila (Birganj, Chirirbandar, Pirgonj, Kotalipara, Mymensingh sadar, Muktagacha, Patiya, Begumganj, Sreepur, Tala sadar, Biswamberpur, Modhupur, and Jhalakati sader) veterinary hospital of eleven (11) different districts (Dinajpur, Thakurgaon, Gopalgonj, Mymenshing, Chittagonj, Noakhali, Gazipur, Sathkhira, Sunamgonj, Tangail and Jhalakati) in Bangladesh from January' 2014 to June' 2014. A total of 32 cases were identified through history from the respective owner, necked eye examination of the clinical signs with some physical diagnostic procedures. Different congenital defects were categorized and recorded in a registrar note book. Then the recorded defects were classified according to their body system involvement. The regular in-coming patients in the veterinary hospital of the respective upazila were included in this study. Only the animals with defects were considered. The results were analyzed and presented in a tabular form.

Results and Discussion

The result of the present study revealed that 32 ruminant animals (29 calves and 3 kids) demonstrated the evidence of congenital defects at different selected areas of Bangladesh (Table 1). As presented in table 2, the prevalence of atresia ani was recorded to be the highest (58.62) and it is in agreement

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Table 1. The prevalence of congenital defects in calves and kids in different areas

Name of Areas	Total No. of congenital defects	Percentage (%) of total congenital defects	Total congenital defects of Calf	Percentage (%) of Total congenital defects of Calf	Total congenital defects of Kid	Percentage (%) of Total congenital defects of Kid
Birganj, Dinajpur	3	9.38	2	6.90	1	33.33
Chirirbandar, Dinajpur	1	3.13	1	3.45	_	_
Pirgonj, Thakurgaon	3	9.38	3	10.34	_	_
Kotalipara, Gopalgonj	2	6.25	2	6.90	_	_
Sadar, Mymensingh	1	3.13	1	3.45	_	_
Muktagacha, Mymensingh	2	6.25	2	6.90	_	_
Patiya, Chittagonj	1	3.13	1	3.45	_	_
Begumganj, Noakhali	6	18.75	6	20.69	_	_
Sreepur, Gazipur	2	6.25	1	3.45	1	33.33
Tala sadder, sathkhira	4	12.25	3	10.34	1	33.33
Bishwamberpur, Sunamganj	1	3.13	1	3.45	_	_
Modhupur, Tangail	5	15.63	5	17.24	_	_
Sadar, Jhalakati	1	3.13	1	3.45	_	_
Total	32	-	29	-	3	-

with the previous report of Jubb *et al.* (1992). According to Leipold *et al.* (1983) it was regarded to be hereditary and due to single autosomal recessive gene. The actual cause of atresia ani is yet to determine. However it was assumed to be correlated with the teratological defects of the hind gut (Slatte, 1985). Clinical examination revealed absence of anal opening. Atresia ani with supernumerary hind limb has been reported by Ali and Hossain, (1986) and Ali *et al*. (1980). Taillessness and atresia ani were also recorded by Samad and Hoque, (1986). Tongue deformity, bent leg, congenital skin outgrowth, inherited congenital hypotrichosis, neonatal neck paralysis, dermoid cyst and neonatal blindness were low rated as 6.89%, 10.34%, 6.89%, 3.44%, 3.44%, 10.34% and 3.44 % respectively (Table 2). In case of kids three cases were found positive only with atresia ani. The prevalence of inherited congenital hypotrichosis and Neonatal blindness in neonatal calves were recorded as low as 3.44% in both cases.

Table 2. Types congenital defects in calves and kids according to body systems

System of the body	Name of the congenital defects	No .of congenital defects in calves	Percentage (%) of specific congenital defects in calves	No. of congenital defects in kids	Percentage (%) of no. of specific congenital defects in kids
Digestive System	Atresia ani	17	58.62	3	100
	Tongue deformity	2	6.89	-	-
Musculo-skeletal System	Bent Leg	3	10.34	-	-
	Congenital skin outgrowth	1	6.89	-	-
	Inherited congenital hypotrichosis	1	3.44	-	-
	Neonatal Neck Paralysis	1	3.44	-	-
Ocular System	Dermoid Cyst	3	10.34	-	-
	Neonatal	1	3.44	-	-
Total		29		3	

The distribution of congenital defects according to body system was also studied in this experiment. The involvement of digestive system was 65.52% (Table 3) and it remained the top among all the systems studied. Musculoskeletal system and Ocular System involvement in calves were found less which accounted for 20.69% and 13.79% respectively. However, only digestive system was found to be involved in congenital defects in kids. Similar types of findings were also reported by some researchers. A study on bovine congenital defects was carried out by Samad (2000) documented that the distribution of congenital defects as per body system showed more involvement of digestive system (37.04%). Singh (1989) reported 36.6% congenital malformation in the digestive system but such type of study is very rare in Bangladesh.

May); rainy (June to October) reason the prevalence were 28.66%; 11.33%; 24.66%; respectively. The highest prevalence was found in winter season and lowest in summer season.

Table 3: Body systems involvement to congenital defects

System of body	Total congenital defects per system	Total congenital defects per system in calves	Percentage (%) of total congenital defects per system in calves	Total congenital defects per system in kids	Percentage(%) of total congenital defects per system in kids
Digestive System	22	19	65.52	3	100
Musculo-Skeletal System	6	6	20.69	-	-
Ocular System	3	4	13.79	-	-
Total	32	29		3	

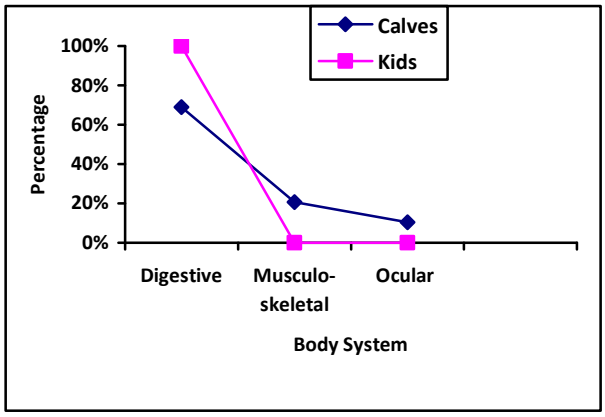

Figure 1. Percentage of body systems involvement in congenital defects

Conclusions

Different types of congenital defects occur in ruminant. Among these, atresia ani is the most prevalent one in calves and kids, but it is easy to correct surgically. The other congenital defects may cause great economic losses to the farm as they can't be easily corrected by means of surgical operation. So, proper measures and necessary steps should be taken to identify the underlying causal factors and to avoid identified congenital defects in calves and kids.

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Author contribution
First and fourth authors bears the equal contribution in experimental design, methodology selection, data collection and analysis and write up the manuscript. The other authors have contribution to experimental design and methodology selection and finally approved the manuscripts.

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