



## Occurrence of *Schistosomus reflexus* in neonatal bovine calves in certain areas of Bangladesh: a retrospective study

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### Abstract

A retrospective study was conducted to investigate the occurrence of *Schistosomus reflexus* in calves from January 2012 to December 2016. Occurrence of *Schistosomus reflexus* in neonatal calves was studied in relation to breed, sex and seasons of calving. Clinical signs were angulation of limbs and no abdominal closure. Results showed 8.41% *Schistosomus reflexus* in surgically intervened cows. The percentage of indigenous calves affected with *Schistosomus reflexus* was as high as 42.86%, and in crossbred this was 57.14%. The percent of female calves born with *Schistosomus reflexus* was higher (60.0%) than the males (40.0%). Maximum occurrence (42.86%) of *Schistosomus reflexus* was recorded in the summer followed by rainy (37.14%) and winter seasons (20.0%). Among the studied areas, highest occurrence was recorded in Mymensingh Sadar (68.57%) followed by in Patuakhali Sadar (17.14%) and Bauphal (14.29%) upazilla of Patuakhali district. However, this study provides some basic information to veterinarians, researchers and farmers about the occurrence of *Schistosomus reflexus* in calves.

**Keywords:** *Schistosomus reflexus*, malformations, crossbreed, calves.

## INTRODUCTION

Congenital disorders and malformations represent a hidden danger for animal production. Congenital defects, structural or functional abnormalities presented at birth are challenges facing by the clinician (Newman *et al.*, 1999). Major congenital defects of calves in Bangladesh are congenital urinary obstruction, umbilical hernia, atresia ani, dermoidcysts, nonfunctional limb joints, embryonic duplications, *Schistosomus reflexus* (Hossain *et al.*, 1986). Among them, *Schistosomus reflexus* is a rare fetal monster congenital birth defect primarily seen in ruminants (Suthar *et al.*, 2011; Bhat-tacharyya *et al.*, 2012). The condition commonly occurs in cattle (Suthar *et al.*, 2011), sporadically in goats and ewes (Tsuma und Abuom, 2008) and even in dogs (von Heimen-dahl und Cariou, 2009). Such occurrences are costly to the cattle industry and farmer because of dead offspring, loss of milk production and cost of fetal extraction (Morrow, 1986). Prevalence of *Schistosomus reflexus* is highest in cattle with range 0.01 to 1.3% (Knight, 1996) of bovine dystocia. A true *Schistosomus reflexus* is classified as a case with both dis-

played viscera and spinal inversion (Laughton *et al.*, 2005). As there is no previous data on *Schistosomus reflexus* in ruminants in Bangladesh, therefore, a retrospective investigation was carried out to investigate the occurrence of *Schistosomus reflexus* in new born bovine calves in selected regions of Bangladesh and to study the relationship of different influential factors such as breed, sex and seasons with the occurrence of *Schistosomus reflexus*.

## MATERIALS AND METHODS

### Study Area and Period

This study was conducted in upazilla Veterinary Hospital of Bauphal and Patuakhali Sadar of Patuakhali and Veterinary Teaching Hospital, Bangladesh Agricultural University (BAU) and the data considered from January 2012 to December 2016.

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## Study Population

During the period of study, 416 congenitally malformed calves were recorded from register book or data sheet. Among them 35 calves were diagnosed as *Schistosomus reflexus*. The identified calves were categorized based on sex, breed and season.

## Sources and Nature of Data

The study was carried out based on clinical data sheet or record book with the history and clinical signs suggested to *Schistosomus reflexus* in newborn bovine calves at BAU and two Upazila Veterinary Hospitals in Patuakhali district. The data were collected and checked manually for obvious inconsistencies, recording errors or missing data. The affected calves were divided into following categories:

- (a) Sex:
  - i. Male
  - ii. Female
- (b) Breed:
  - i. Indigenous
  - ii. Cross
- (c) Season:
  - i. Summer (March to June)
  - ii. Rainy (July to October)
  - iii. Winter (November to February)

## Data analysis

Descriptive analysis was performed. Data were collected and calculated to determine the occurrence of *Schistosomus reflexus* in the above-mentioned species. The occurrence of *Schistosomus reflexus* was calculated according to sex, breed and season. The occurrence of surgical affections in the selected areas was calculated with the following formula:

$$\text{Occurrence} = \frac{\text{Number of calves diagnosed as } \textit{Schistosomus reflexus}}{\text{Total surgically malformed neonatal calves}} \times 100$$

## RESULTS

### Congenital Surgical Affections in Calves

The overall occurrence (%) of calf congenital surgical affections observed during the study period is given in Table 1. Total number of congenitally malformed calves was 416

among which, thirty five cases were recorded as *Schistosomus reflexus* and the occurrence was 8.41%.

### Occurrence of *Schistosomus Reflexus* in different study areas

Overall occurrence of *Schistosomus reflexus* in selected areas of Bangladesh is presented in Table 2. Highest occurrence was found in BAU VTH (68.57%) followed by in Patuakhali Sadar (17.14%) and the least was in Bauphal (14.29%) upazilla of Patuakhali district.

### Occurrence of *Schistosomus Reflexus* in relation to sex

Occurrence of *Schistosomus reflexus* in calves of different sexes is presented in Table 3. The study revealed that higher occurrence of these sorts of malformed calves was found in female calves than those of male ones. Number of male and female congenitally malformed calves (*Schistosomus reflexus*) were 14 (40%) and 21 (60%) respectively.

### Occurrence of *Schistosomus reflexus* in different breeds

We also investigated if there was any influence of breed on the occurrence of *Schistosomus reflexus*. Data of indigenous and cross-bred calves were recorded and higher occurrence of the cases was found in crossbred calves which was 42.86%. In indigenous calves, this was 57.14% (Table 4).

### Occurrence of *Schistosomus Reflexus* in relation to season

We found the highest occurrence of *Schistosomus reflexus* in summer (42.86%) than those in rainy (37.14%) and winter seasons (20.00%) (Table 5).

## DISCUSSION

Congenital defects are the abnormalities of structure or function present at birth occur frequently in cattle (Leopold, 1997). This may be the result of teratogenic agents, embryonal accidents or genetic mutation (Filkins und Mylon, 1965). The information regarding congenital *Schistosomus reflexus*, and success rates of treatment in animal is very low. Therefore, a retrospective study was carried out in cattle to determine the occurrence of *Schistosomus reflexus* in new-born bovine calves. It was found that the occurrence of *Schistosomus reflexus* in new-born bovine calves is 8.41%.

Table 1: Overall occurrence (%) of congenital malformations of calves in Mymensingh and Patuakhali.

Congenital malformations	No. of malformed calves	Occurrence (%)
Atresia ani	87	20.91
Atresia ani et recti	39	9.38
Congenital umbilical hernia	31	7.45
Contracture of muscles, ligaments and ankylosis of limbs	48	11.54
<i>Schistosomus reflexus</i>	35	8.41
Hydrocephalus	14	3.37
Dermoid cyst	19	4.57
Accessory limbs	17	4.09
Hydrothorax	5	1.20
Ascites	3	0.72
Epulis	17	4.09
Abnormal hoof formation and defects of hoofs' keratin	11	2.64
Congenital urinary tract obstruction	14	3.37
Aplasia in female genitals	7	1.68
Rectovaginal fistula	7	1.68
Persistent urachus	6	1.44
Cryptorchidism	5	1.20
Hypoplasia of testes and scrotum	9	2.16
Congenital skin outgrowth	18	4.33
Scoliosis and Spondyloschisis	5	1.20
Cleft palate	19	4.57
Total	416	100

Table 2: Occurrence of *Schistosomus reflexus* in calves of different places of Bangladesh.

Veterinary Hospital	No. of malformed calves	No. of <i>Schistosomus reflexus</i> calves	Occurrence (%)
BAU, VTH	223	24	68.57
Patuakhali Sadar Veterinary Hospital	104	6	17.14
Bauphal Upazila Veterinary Hospital	89	5	14.29
Total	416	35	100

In our study, we have exhibited occurrence of congenital surgical affections in calves, among them, atresia ani was in top most position (20.91%) subsequently followed by limb ankylosis (11.54%), Atresia ani et recti (9.38%), *Schistosomus reflexus* (8.41%) and Umbilical hernia (7.45%). This result is in agreement with previous findings (Hossain *et al.*, 2014) who reported 18% cases of atresia ani (sim-

ple and complicated) among which atresia ani is 9%, followed by atresia ani et recti (4.6%). Virtala *et al.* (1996) found 15% occurrence of umbilical hernia in dairy calves. We found 35 (8.41%) cases of *Schistosomus reflexus* among 416 total affections during the study period. The findings of present study are higher from the previous ones. Knight (1996) reported 90 *Schistosomus reflexus* (1.31%) out of

Table 3: Occurrence of Schistosomus reflexus in relation to sexes of calves.

Sex	No. of congenitally malformed calves	No. of Schistosomus reflexus calves	Occurrence (%)
Male	228	14	40
Female	188	21	60
Total	416	35	100

Table 4: Occurrence of Schistosomus reflexus in different Breeds.

Breeds	No. of congenitally malformed calves	No. of Schistosomus reflexus calves	Occurrence (%)
Indigenous	240	15	42.86
Cross-bred	176	20	57.14
Total	416	35	100

Table 5: Occurrence of Schistosomus reflexus in relation to season.

Season	Congenitally malformed calves	No. of Schistosomus reflexus calves	Occurrence (%)
Summer	133	15	42.86
Rainy	173	13	37.14
Winter	110	7	20.00
Total	416	35	100

6901 cases of bovine dystocia attended during a 20-year period. Higham (1987) reported the Schistosomus reflexus representation around 8-10 (2-2.5%) of over 400 dystocia per year and 4 (2.07%) cases of Schistosomus reflexus in 193 dystocia. Schistosomus reflexus appeared relatively often (Saperstein, 1993). This is a malformation with important clinical implications and is always a challenge for veterinarians and breeders, often baffling for less experienced obstetricians (Saperstein, 1993).

We found the highest occurrence of Schistosomus reflexus at Mymensingh Sadar (68.57%) followed by Patuakhali Sadar (17.14%) and Bauphal (14.29%) (Table 2). Farmers around Bangladesh Agricultural University (BAU) Veterinary Teaching Hospital (VTH) usually prefer artificial insemination (AI) rather than natural service. That may be one of the reasons why the condition is higher in Mymensingh.

There was strong relation with the occurrence of Schistosomus reflexus between sexes of calves in this study. Occurrence of Schistosomus reflexus was higher in female (60%) than in the male (40%). The total number of affected male

calves was 14 whereas in female it was 21. We are unaware of finding of Schistosomus reflexus in calves to compare our data but there are some findings on other malformations like atresia ani. Our finding differs with the findings of Martens et al. (1995) who stated higher occurrence atresia ani in male calves (76%). Whereas Azizi et al. (2010) found no gender predilection for atresia ani. In terms of breed, a higher occurrence of Schistosomus reflexus was in cross-bred, which was 42.86% and 57.14% in indigenous and crossbred respectively.

Both genetic and environmental factors are recognized as major causes of congenital malformation (Hartley und Haughey, 1974; Dennis, 1975). Abnormal development is usually caused either by genotypic or environmental factors, in addition failure to meet the temporal-spatial requirements of development (Bai et al., 2004). It is worthwhile to point out that autosomal recessive gene has an effect on crossbred animal and animal born with congenital malformation (Samad, 2008). The higher incidence in crossbred calves may be due to preference of owners to inseminate their cows with these breeds. Pure Holstein cattle and the offspring of Holstein with

indigenous cross are more likely to suffer from this congenital defect than the indigenous breed (Kohli, 1999). However, the information derived from this study will increase the knowledge of clinicians to understand about the congenital cases and identification of risk factors to promote these malformations, which will help them to take necessary preventive measures against these disorders.

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## CONFLICT OF INTEREST

The authors have no conflict of interest.

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