

Characteristics of bovine pulmonary parasites in Bangladesh

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(Received 7 January 2009, accepted in revised from 20 March 2008)

Abstract

In a cross-sectional abattoir survey of bovine pulmonary diseases in Mymensingh, during September 2001 to April 2002, subclinical *Dictyocaulus viviparus* infection was found in mesoendemic level in Bangladeshi adult zebu cattle. The number of mature lung worms varied from 1~18 in individual lungs. One to five mature lung worms were most frequent (74.2%) followed by 6 to 10 (19.3%) and 11~18 (6.5%). Of the total 123 mature worms collected from 31 lungs, there were 50 (40.7%) male and 73 (59.3%) female worms. The female lungworms (mean length 14.41mm) were significantly ($P < 0.01$) larger than the male lungworms (mean length 11.28mm). The number of hydatid cysts varied from 1~80 in individual lungs. One to five (1~5) cysts were recorded most commonly (76.0%) followed by 11~80 (20.0%) and 6~10 (4%). The size (diameter) of the hydatid cysts ranged from 2~12cm. Of the total 203 hydatid cysts collected from 31 lungs 45 (22.2%) cysts were fertile and 158 (77.8%) cyst were sterile.

Key words : Lungworm, Hydatid cyst, Bovine

INTRODUCTION

The detail description of bovine pulmonary parasites is available from several authors (Hoque and Samad, 1996; Urquhart et al, 1996; Moazeni et al, 2000). About 29% and 24% of adult cattle of Bangladesh are found to be infected subclinically with lungworm and hydatid cysts respectively (Rahman et al, 2002). Lungworm infections predominantly occur in young animals whereas older animals develop an acquired immunity (Eysker et al, 1994). As this is the first report of bovine lungworm infection in Bangladesh, the characteristics of those parasites should be explored accordingly. So the

characteristic of the pulmonary parasites along with the cysts found in abattoir survey of Bangladesh are described in this paper.

MATERIALS AND METHODS

Lungs of 10⁴ slaughtered animals were collected for this study. Clinical examination of cattle was made individually on the day (s) before slaughter. The animals were given number plates during examination and the number plate was subsequently tied to the trachea after slaughter. The numbered lungs were collected from the butcher house immediately after slaughter. The lung together with trachea was placed in on a large deep tray.

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Table 1. Frequency distributions of pulmonary parasites in individual cattle

No. of parasites	Lungworms		No. of cysts	Hydatid cyst	
	No. of lungs	%		No. of lungs	%
1-5	23	74.2	1-5	19	76.0
6-10	6	19.3	6-10	1	4.0
11-18	2	6.5	11-80	5	20.0
Total	31	100.0		25	100.0

Table 2. Zender distribution of worms in individual lungs of cattle

Worms	No. of lungs affected	Sex	Mean \pm SE	Mode	Median	Range
Lungworm	21	Male	2.38 \pm 0.40	1	2.00	1-8
	29	Female	2.52 \pm 0.43	1	2.00	1-10
		Total	2.46 \pm 0.30	1	2.00	1-10
Hydatid cysts	19	Sterile	8.32 \pm 3.30	1	2.00	1-61
	14	Fertile	3.21 \pm 0.92	2	2.00	1-14
		Total	6.15 \pm 1.97	2	2.00	1-61

The trachea and bronchi were cut open with scissors. The main bronchioles were cut open up to their tips followed by the smaller lateral bronchioles. Then the lungs were washed thoroughly in lukewarm normal saline in a bucket. The saline was poured through a wire mesh screen with an aperture of 0.038mm. The material retained in the mesh was gently washed and then fixed in formalin. The materials were examined under a dissecting microscope for counting and identification of the lungworms following the procedure published in literature (Ministry of Agriculture, Fisheries and Food, 1977). The other lung parasites were studied and identified using the standard procedure (Soulsby, 1982). Z-test was used to assess any significant difference between mean length of mature male and female lung worm (Gupta, 1983)

RESULTS

The lungworms collected in this study were identified as *Dictyocaulus viviparus*. Numerous immature worms were collected along with mature worms from individual lungs. The frequency distribution of pulmonary parasites is shown in Table 1. The number of mature worms varied from 1~18 in individual lungs. One to five (74.2%) mature lung worms were most frequent followed by 6 to 10 (19.3%) and 11~18 (6.5%).

Table 3. Gender fertility distribution of pulmonary parasites in individual bovine lungs

Parasites	No. of lungs affected	%	Male*	Female**
Lungworms	19	61.3	+	+
	2	6.5	+	-
	10	32.3	-	+
Total	31	100.0	+	+
Hydatidosis	8	32.0	++	+++
	11	44.0	+	-
	6	24.0	-	+
Total	25	100.0	+	+

*Sterile and, **Fertile in case of hydatid cyst

The number of cysts varied from 1~80 in individual lungs. One to five cysts were recorded most commonly (76.0%) followed by 11~80 (20.0%) and 6~10 (4%).

The gender distribution of pulmonary parasites in individual infected lungs is shown in Table 2. Of the total 123 mature worms collected from 31 lungs, there were 50 (40.7%) male and 73 (59.3%) female worms. Two (6.4%) lungs contained male worms only.

Of the total 203 hydatid cysts collected from 31 lungs 45 (22.2%) cysts were fertile and 158 (77.8%) cyst were sterile.

The fertility distribution of pulmonary parasites in individual infected lungs is shown in Table 3. Among the total 31 affected bovine lungs 61.3% contained both male and female lungworms whereas 24% of the

Table 4. Size of bovine pulmonary parasites

Parasites	Sex/fertility	No. of parasites	Mean \pm SE	Mode	Median	Range
Lungworms (Length, mm)	Male	50	11.28 \pm 0.40	10	11.00	5-16
	Female	73	14.41* \pm 0.33	17	15.00	8-19
	Total	123	13.09 \pm 0.31	14	13.00	5-19
Hydatid cysts (Diameter, cm)	Sterile	158	5.67 \pm 0.4	34	5.0	3-10
	Fertile	45	6.75 \pm 0.6	96	6.5	3-11
	Total	203	6.06 \pm 0.38	6	6.0	3-11

*Significant at 1% level ($P < 0.01$)

affected lungs had fertile cysts only.

The size of these parasites has been shown in Table 4. The length of the mature lungworms varied from 5~19mm. The female lungworms (mean length 14.41mm) were significantly ($P < 0.01$) larger than the male lungworms (mean length 11.28mm).

The size (diameter) of the hydatid cysts ranged from 3~11cm. The size of the cysts varied according to the number of cysts present in individual lungs. Lungs containing few cysts had larger diameter.

DISCUSSION

The presence of large number of worms in individual lungs was reported from other countries (Van der Fels-Klerx et al, 2001). The length of the mature worms measured by other workers include: 40~80mm (Soulsby, 1982) up to 80mm (Urquhart et al, 1996) and 65mm (Moazeni et al, 2000). The presence of much smaller lungworms in the current study perhaps is due to the presence of small strain or stunt form in imm-unized adults in Bangladesh. The female worms (8~19mm) were found significantly larger than the male worms (5~16mm). This finding confirms the report of other countries (Soulsby, 1982; Urquhart et al, 1996).

The size (diameter) of the cysts reported in animals by other investigators is 5~10cm (Soulsby, 1982) and up to 20cm (Urquhart et al, 1996). Isolation of the parasites should be performed from a representative sample of the cattle population to know the actual characteristic of the parasite.

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