Outbreak of Fatal Subacute Bubaline Fasciolosis in Wayanad, Kerala, India

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Abstract: Present communication deals with a fatal outbreak of subacute fasciolosis in male buffalo calves in Wayanad district. During first week of February 2012, six out of 25 male buffalo calves aged 6-9 months, owned by a farmer residing near the dam site of Karappuzha, Wayanad district died suddenly during a period of 3-4 days. The animals were brought to Kerala 4 weeks back from Andhrapradesh for fattening. On post-mortem examination, the peritoneal cavity was filled with ascitic fluid. Liver was enlarged and large numbers of migrating flukes were observed. Snails collected from nearby water bodies released only echinostome cercariae. It was concluded that the infection occurred not from Kerala and might have happened from Andhrapradesh. Treatment with Triclabendazole at the dose rate of 24 mg/Kg body weight saved the rest of the animals.

Keywords: Buffalo, *Fasciola gigantica,* Wayanad district, Echinostome cercaria, Triclabendazole.

INTRODUCTION

Buffaloes are the largest high-energy milk and lean meat producer in India. So they can play a versatile role in the socio-economic upliftment of rural farmers, especially in a developing country like India [1]. Of the 166.4 million global buffalo population, India contributes 97.9 million [2], which is about 59 per cent of the world buffalo population. As per quinquennial 2003 livestock census, Kerala's share in Indian buffalo population is only 0.65 lakhs, which is 0.07 per cent of Indian buffalo population. Due to the demand of beef for human consumption, many farmers in Kerala initiated male buffalo calf rearing as a newer profitable enterprise. For this purpose, they transport male buffalo calves (40-50 kg) from nearby states like Tamil Nadu, Karnataka and Andhra Pradesh to Kerala, fatten and cull them when they attain 150-200 Kg bodyweight. They are maintained entirely by grazing on grasslands and are seldom fed with concentrates, dewormers, mineral and vitamin mixtures. Hence, the chances for acquiring and developing parasitism are more for these animals.

Buffaloes are lesser susceptible to infectious diseases than cattle [3]. However, high sensitivity to solar radiation, poor body thermoregulation and wallowing nature predisposes buffaloes to snail borne infections. Fasciolosis have been a major economic threat to ruminants especially buffaloes in tropical and sub-tropical countries like India [3]. Acute form of fasciolosis is caused by presence of immature migrating flukes in liver and cases due to this are rarely reported in cattle and buffaloes from India [4]. Chronic form due to the presence of adult flukes in liver and bile duct was previously reported in large ruminants from the country [5, 6]. Fasciolosis causes economic loss by reducing meat and milk productivity and mortality in all ages of animals [7]. In recent past, global losses due to fasciolosis were estimated over US $3,200 million per annum [3].

The present communication deals with the first report of outbreak of fasciolosis causing mortality in male buffalo calves in Kerala.

During first week of February 2012, six out of 25 male buffaloe calves aged 6-9 months, owned by a farmer residing near the dam site of Karappuzha, Wayanad district in Kerala died. All deaths were occurred during a period of 3-4 days without showing any clinical symptoms. These animals were brought 4 weeks back from Andhra Pradesh to Kerala for fattening purpose. Animals were maintained entirely by grazing on grasslands and were let free for wallowing in the nearby water bodies. The deworming history was not available.

Among the six animals died, two animals were subjected to post-mortem examination. All the live animals were treated with triclabendazole at the rate of 24 mg/Kg body weight. No deaths were reported later. Snails were collected from the water bodies where these animals usually graze. Snails were identified [8]

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and tested for release of cercariae. Clean glass test tubes were filled with water and snails were kept singly in separate tubes. These tubes were placed under light source and kept undisturbed for a minimum of two hours. Infected snails were identified based on release of cercariae, which appeared as motile white spots. They were examined under microscope and identified [9]. Snails were also dissected to check for the presence of larval forms. Faecal sample examination of survived animals was also done. DNA was isolated from immature flukes and polymerase chain reaction (PCR) with *Fasciola gigantica* specific primers [10] was carried out.

Post-mortem examination revealed the following observations. The peritoneal cavity was filled with blood mixed ascitic fluid. Liver was enlarged. Large numbers of migrating immature flukes of different developmental stages were observed in the liver (Figure **1**). Numerous severely bleeding migratory tracts were observed on liver. Flukes measured more than 2 cm in length. PCR amplified 235 bp *Fasciola gigantica* specific product, when the DNA isolated from these flukes were used as template. A few adult *Fasciola* and amphistomes were observed in the bile duct and gall bladder.

The condition revealed no clinical manifestations before death. The immature flukes collected from the liver were larger (>2cm) and hence they might have completed at least 5-6 weeks of migration. Moreover, the presence of few mature flukes from the bile duct indicate that these animals were infected at least 6 weeks prior to death.

Faecal sample examination of survived animals did not reveal any parasitic ova as eggs are not produced by the immature flukes at this stage. All these features indicate subacute nature of the disease in these buffalo calves rather than acute form, which is reported mainly from sheep.

Snails collected from the area showed thin, ovate, imperforate shell. Spire was exerted and had a large body whirl with oval aperture. These snails were identified as *Lymnea* sp. Released cercariae showed a well-developed oral and ventral sucker, along with 37 collar spines and hence identified as *Echinostoma* sp. Dissection of snails revealed presence of large number of highly motile cercaria, redia and encysted metacercariae in them.

It was concluded that the *Fasciola* infection in these bubaline calves due to ingestion of metacercariae might have occurred not from Kerala as they were brought to this place four weeks back only. It is also presumed that infection might have happened from Andhra Pradesh, from where these animals were brought to Wayanad. Moreover, Andhra Pradesh is endemic for bubaline fasciolosis.

Tropical fasciolosis caused by *F. gigantica,* an inhabitant of hepatobiliary system of domestic ruminants was reported previously from fourteen Indian states and Union territories [11-13]. In India, prevalence of fasciolosis in buffaloes varies from 10 to 100% [3]. Prevalence of bovine fasciolosis in different parts of India include, 14.71% in Punjab [14], 20.43% in Uttar Pradesh [15], 39.61% in Haryana [16], 52.9% in

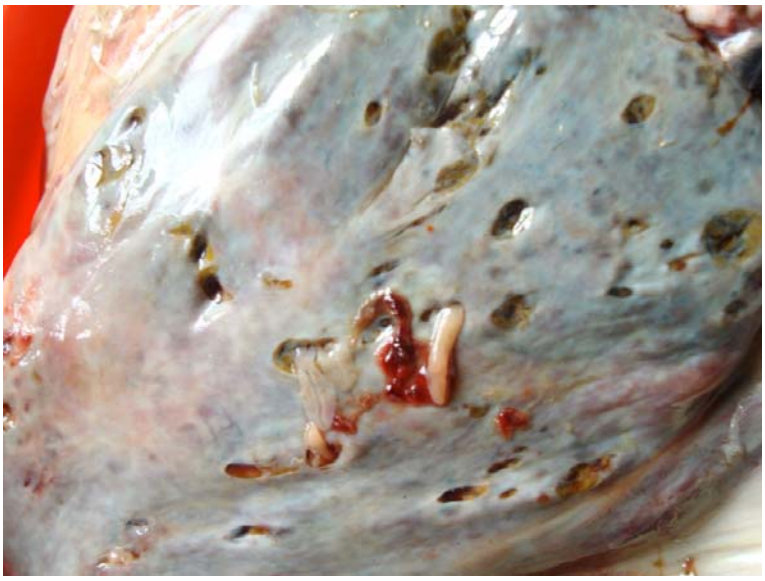

Figure 1: Liver showing migrating *F. gigantica***.**

Uttharanchal [17], 53.2% in Meghalaya [18] and 85.1% in Jammu and Kashmir [19]. A single case was reported from Tamil Nadu [20]. Murrah buffaloes are highly susceptible to *F. gigantica* infection [3] compared to other breeds in India. Young animals especially below an year of age are more susceptible to infection, in which migration of immature flukes, often result in sudden death [21]. However, animals over 6 years are frequently affected with the disease [22]. There are different forms of the disease *viz.,* acute, subacute and chronic form. Subacute fasciolosis is caused by the migration of large number of immature flukes, in the liver leading to an early fibrosis [17]. Pathogenicity of acute form is traumatic hepatitis caused by large number of simultaneously migrating immature flukes, causing severe destruction of liver parenchyma. Hemorrhage in liver and sometimes into peritoneal cavity takes place. This condition is almost invariably seen in sheep especially of 6-8 weeks age [4]. In chronic condition, the number of flukes migrating in the liver will be less and immature flukes develop to adult in the bile duct. Condition is manifested as hepatic fibrosis and hyperplastic cholangitis, characterized by thickening of bile duct epithelium leading to 'pipe stem liver'. The affected animal will show clinical signs and on faecal sample examination eggs could be detected [4]. Ingestion of moderate numbers of metacercariae lead to subacute form, leading to migratory tracts and early fibrosis. Infiltration of white cells is more evidenced. Death occurs suddenly or after several days. Mortality of 20-33% of Murrah buffaloes due to experimental infection with 800-1000 metacercariae was recorded [13, 23]. Freshwater aquatic snails of the family Lymnaeidae are the snail vectors for this disease. Juvenile flukes released from the metacercariae will undergo migration in peritoneal cavity for a period of one week and then will move to hepatic parenchyma, where it will migrate for 6-8 weeks before gaining entry to bile duct and develop to adult [4]. Adults lay eggs which are passed through faeces 11-12 weeks postinfection [24, 25]. The principal pathogenic effects of fasciolosis are anaemia and hyperalbuminemia [9]. Diagnosis of fasciolosis relies on the detection of eggs in the faecal sample, which is possible only after 10^{th} week of infection [26]. Diagnosis of acute condition is difficult, as eggs are not passed through faeces [4]. Triclabendazole is considered as the drug of choice for fasciolosis, because of its high efficacy against both mature and immature flukes [27]. However, the bioavailability of the drug is significantly lower in buffaloes compared to cattle. Hence, for treatment of fasciolosis in buffaloes, a dose rate of 24 mg/Kg was used instead of the normal recommended dose 12 mg/Kg [28].

The echinostome cercariae have a predatory behaviour towards the other types of larval trematodes [29]. The echinostome cercaria is commonly found in snails throughout Kerala and that may be one of the reasons for non-establishment of fasciolosis in the state.

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