PRÉVALENCE DE LINGUATULA SERRATA CHEZ LES RUMINANTS DOMESTIQUES DU SUD DE L'INDIE

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Abstract. Linguatula serrata Frohlich, 1789 est un parasite endoparasitaire d'occasional zoonoses de grande importance dans l'homme. Nous rapportons la prévalence des stades nymphiques encapsulés de L. serrata chez des ruminants domestiques au cours d'une enquête dans la région de Wayanad, située dans l'État de Kerala, Inde du Sud. Les parties du conduit intestinal ont été examinées de 100 chèvres, bœufs et buffles chacun révélant une prévalence d'infection de 21, 19, et 8%, respectivement. La prévalence de L. serrata chez les ruminants est plus élevée que les antécédents de l'Inde et indique un fort focus d'infection chez les herbivores domestiques de l'Inde du Sud. L'importance potentielle de ces résultats pour la santé humaine est discutée.

INTRODUCTION

Linguatula serrata Frohlich, 1789, devenu communément connu sous le nom de ‘tongue worm’ est un parasite endoparasitaire d'occasional zoonoses de grande importance dans l'homme. Le Phylum Pentastomida comprend environ 100 espèces d'linguatulids, parmi lesquelles sont endoparasites du pharynx et autres cavités du corps de tetrapod vertebrates, en particulier des reptiles. Les affinités évolutives de ce groupe d'organismes ont continué à confondre les biologistes à cause des similitudes morphologiques avec les annélides et les arthropodes, et des relations phylogénétiques suggérées entre les crustacés dans la sous-classe des Branchiura (Raff, 1998). Parce que pentastomes semblent avoir une affinité plus forte vers les arthropodes, certains auteurs considèrent ce groupe d'organismes comme un super-ordre (Pentastomida) dans le Phylum Arthropoda (Beaver et al., 1984). En dépit de son véritable rang taxonomique dans le règne des invertébrés, il n'y a pas d'erreur à confondre ce parasite extraordinaire lorsqu'on le retrouve chez un hôte parasité.

Les adultes parasites se trouvent généralement dans les voies respiratoires et les organes du corps des oiseaux, des reptiles et des mammifères, où les femelles déposent des œufs qui sont éliminés dans les voies respiratoires dans les expectorations et les muqueuses. De manière commune, les carnivores sont des hôtes définitifs pour les pentastomes qui se trouvent généralement dans les sinus nasaux et le pharynx (Khalil, 1970, 1973; Pandey et al., 1987; Meshgi et Asgarian, 2003). Linguatula serrata dans les chiens (chiens) et les humains peut entraîner un pharyngite linguatulosis (pentastomiasis) produisant un état appelé halzoun ou marrara syndrome (Khalil et Schacher, 1965). Ce parasite a également été impliqué dans l'involvement viscéral causant une granulome hépatique chez les humains (Baird et al., 1988) et d'autres organes (Prathap et al., 1969). Une grande variété de ruminants domestiques et des herbivores sauvages peuvent agir comme hôtes intermédiaires après ingestion d'œufs via de la nourriture et de l'eau contaminées. Les œufs se développent et les larves se développent dans le système digestif...
canal eventually migrating to various internal organs and tissues (eg, mesenteric lymph nodes) transforming into nymphs that become encapsulated (Soulsby, 1982). The occurrence of the parasites in domestic and wild animals used as a food source by humans including cattle, buffaloes, sheep, goats, pigs, has been well documented (Sachs et al, 1973; Young, 1975; Khalil, 1976; Saiyari et al, 1996; Tavassoli et al, 2007). Humans and other carnivores acquire the parasites by ingestion of raw or undercooked viscera of infected animals.

In India, though reports of linguatulosis in canines are few, its prevalence in intermediate ruminant hosts is well documented (Singh et al, 1973; Krishna et al, 1975; Sivakumar et al, 2005). Barring the single report of Muraleedharan and Zaki (1975), the incidence of L. serrata in herbivores in South India is practically unknown. We report the prevalence of L. serrata nymphs encapsulated in mesenteric tissues of domestic ruminants in Wayanad, Kerala State, in South India.

MATERIALS AND METHODS

Intestinal mesentery were examined following the evisceration and dressing of animals at a municipal slaughter house, located at Kalpetta in Wayanad District. Tissue of 100 malabari breed of goats (Capra hircus), cross-bred cattle (Bos indicus x B. taurus) and water buffaloes (Bubalus bubalis) each were inspected for encapsulated pentastome nymphs. Samples were collected from only female cattle and buffaloes while an equal number of male and female goats were examined. Samples were cut into small pieces (approximately 3x3 cm² in size) immersed in normal saline (0.9% NaCl) solution and left undisturbed for 5-6 hours to allow nymphs to emerge from tissue. Recovered nymphs were flattened, dehydrated in ascending grades of ethyl alcohol and cleared in creosote before examining under low power objective of microscope. The parasites were identified based on Soulsby (1982).

RESULTS

The morphology of the parasites and the site from which they were obtained indicated that they were all nymphs of L. serrata (Fig 1). Recovered parasites were grey-white in color, each measuring 4 - 6 mm in length and approximately 1 mm wide (before fixation), anululate/linguiform (tongue-shaped) with obvious external pseudo-segmentation of the body. The anterior end of the body revealed 2 pairs of sickle-shaped binate hooks located on the side of the oral cavity for use in attachment (Fig 2). The outer chitinous cuticle revealed the presence of body rings with minute spines. The posterior end was slightly rounded. Of the 100 goats, cattle, and buffalos examined the prevalence of visceral linguatulosis was 21, 19, and 8%, respectively. There was no significant difference seen in the infection percentage between sexes in goats.

DISCUSSION

Linguatula serrata is a cosmopolitan species and both larval and nymphal stages have been recorded from humans in Africa, Europe, and the Americas (Beaver et al, 1984). Although it has rarely been documented in human in India (Roy and Ganguly, 1940), the common practice of home slaughter of both domestic and wild herbivores may contribute to increased risk of infection wherever this parasite appears relatively common.

Prevalence studies of L. serrata in domesticated animals has found the infection global in distribution with a prevalence as high as 43% in Beirut (Khalil and Schacher, 1965), 25% in Egyptian dogs (Khalil, 1973), 8% from a Cairo abattoir (Khalil, 1970). Even higher prevalence rates of 52.5% in sheep in Iran.
ishing considering that in India the occurrence of the parasite in domestic animals like cattle (Muraleedharan and Zaki, 1975), goats (Singh et al., 1973; Krishna et al., 1975) and buffaloes (Sivakumar et al., 2005) have been well documented. Moreover, no spatial/temporal comparative study on the prevalence of this parasite among different species of domestic herbivores has been reported.

Muraleedharan and Zaki (1975) found *L. serrata* in 5 out of 42 cattle (11.9%) examined at Bangalore, South India, and Sivakumar et al. (2005) reported only 2 out of 100 buffaloes infected in Bareilly, North India. Results of our study indicate that the prevalence of *L. serrata* among ruminants is relatively high when compared to previous reports in India and shows a strong focus of infection in herbivores of South India.

Based on this study, it appears that goats and cattle pose a greater risk as intermediate hosts of *L. serrata* followed by buffaloes. The reason for the lower infection rate in water buffaloes is not clear but may have to do with differing forage habitat and herbaceous foods compared to cattle and goats. It may reflect differing exposure or proximity to definitive hosts (especially dogs) and resultant parasite eggs shed into the environment. Larval or nymphal infection is typically asymptomatic in herbivores while serving as the most likely and important sources of infection for carnivores and humans. Humans typically acquire the infection by ingestion of infected raw liver or lymph nodes of sheep or goat. Most light infections are asymptomatic and more often become incidental findings upon autopsy or found upon radiographic evidence of calcified nymphal cysts. Ingestion of *L. serrata* nymphs can cause a condition called halzoun or marrara syndrome that is often characterized by inflammation of the upper respiratory tract, swelling of the submaxillary and cervical lymph nodes and occasionally abscess formation in the eyes or ears (Khalil, 1976). Yagi et al. (1996) (Tavassoli et al., 2007) and 72% in certain areas of Britain (Sinclair, 1954) have also been recorded. Linguatulosis in domesticated food animals has not been reported in India for nearly 30 years (1975 - 2005). This is aston-
considered the syndrome a hypersensitivity reaction of the upper respiratory tract and buccopharyngeal mucosa. Copious nasal and lachrymal discharge, dyspnea and frontal headache are the most common symptoms occurring within minutes to several hours of taking the meal. Symptoms are associated with pain and itching of throat and ears, cough, hemoptysis and sometimes vomiting. Severe bronchial obstruction due to marked edema, abscess formation in the eustachian tubes and facial paralysis due to involvement of facial nerve are also frequent complications associated with the condition (Parija, 1990). Sporadic incidence of halzoun in humans has also been reported in India (Roy and Ganguly, 1940) and nearby Iran (Maleky, 2001).

The high prevalence of infection observed in ruminants is of concern owing to the zoonotic nature of the parasite and the risk of infection to humans and other animals. Control of halzoun in humans involves (1) awareness of the disease in the community, (2) changing of food habits, and (3) providing clean water for drinking and food preparation to prevent contamination from eggs. Adequate cooking of meat and viscera and drinking properly filtered water will prevent most human infection.

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REFERENCES


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