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SHORT COMMUNICATION

Screening for Zoonotic Fascioliasis in Slaughtered Large Ruminants in Abattoirs in Perak, Malaysia

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Abstrak: Fasioliasis atau infestasi trematoda adalah merupakan penyakit penting yang disebabkan oleh *Fasciola hepatica* dan *Fasciola gigantica*. Kedua-dua spesies ini adalah parasit hepar dan boleh memberi kesan terhadap kesihatan manusia. Aspek zoonotik fasioliasis telah dihuraikan secara lanjut. Sebanyak 80 sampel hepar segar daripada 67 ekor lembu kacukan Kedah-Kelantan dan 13 ekor kerbau Murrah yang diperolehi dari 4 buah rumah sembelih tempatan di Perak telah diperiksa. Kesemua sampel diperiksa secara makroskopik untuk mengesan kehadiran *Fasciola* spp. Keputusan yang diperolehi menunjukkan 7.50% (6 daripada 80) haiwan yang diperiksa menghidap fasioliasis. Daripada jumlah tersebut 7.46% (5 daripada 67) dan 7.69% (1 daripada 13) dikesan positif pada sampel lembu dan kerbau masing-masing. Hanya *F. gigantica* telah dikenal pasti semasa identifikasi spesies. Langkah berjaga-jaga adalah perlu kerana kesan impak zoonotik penyakit ini terhadap kesihatan awam.

Kata kunci: Fasioliasis, Trematoda, Zoonotik

Abstract: Fascioliasis, or trematode infestation, is an important disease caused by *Fasciola hepatica* and *Fasciola gigantica*. Both species are hepatic parasites that affect humans. We have examined the zoonotic aspects of fascioliasis. A total of 80 fresh liver samples were collected from 67 Kedah-Kelantan crossbred cattle and 13 Murrah buffalo at 4 local abattoirs in Perak, Malaysia. The samples were examined macroscopically to detect the presence of *Fasciola* spp. The results show 7.50% (6 of 80) of the animals were diagnosed with fascioliasis. Overall, 7.46% (5 of 67) and 7.69% (1 of 13) of cattle and buffalo samples were positive, respectively. There were only *F. gigantica* species identified in the samples. Our findings suggest that precautions should be taken because the disease has a zoonotic impact on public health.

Keywords: Fascioliasis, Trematode, Zoonotic

Fascioliasis, or trematode infestation, is an important disease caused by *Fasciola hepatica* and *Fasciola gigantica*. Both species are hepatic parasites and are considered plant-borne trematodes that affect humans (Mas-Coma *et al.* 2005). Fascioliasis was included on the list of important helminthiasis affecting human development at the Third Global Meeting of the Partners for Parasite Control held

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at the World Health Organization (WHO) Headquarters in Geneva in November 2004 (Anonymous 2004). A 1972 survey in Malaysia found animal fascioliasis in the following states: Kedah, Perak, Selangor, Pahang, Negeri Sembilan, Malacca and Johor. However, there were no cases of human fascioliasis reported (Saleha 1991). A previous study by Naim *et al.* (2011) in Ipoh, Perak abattoirs found fascioliasis in slaughtered large ruminants.

F. hepatica and *F. gigantica* are common liver flukes or flat worms found in large ruminants and require fresh water snails such as *Lymnaea* spp. as an intermediate host. The miracidia released from embryonated fluke eggs invade the snail and undergo several developmental stages including sporocyst, rediae and cercariae in 5–7 weeks under optimal conditions. The free swimming cercariae are then released in the water and encyst as metacercariae. The metacercariae is the infective larvae, which has a hard outer cyst wall and can survive for prolonged periods in wet environments and on aquatic vegetation. Large ruminants and humans acquire the infection by accidentally eating the fresh vegetation containing the infective metacercariae. The ingested larvae will excyst in the duodenum and migrate through the intestinal wall, peritoneal cavity, and the liver parenchyma into the biliary ducts where they develop into adult flukes. In humans, it requires 3–4 months for the metacercariae to mature into adult flukes. The released unembryonated fluke eggs from the bile duct are passed in the faeces to complete the life cycle of the parasites (Center for Disease Control and Prevention [CDC] 2013).

The aim of this study is to determine the presence and identify *Fasciola* spp. in large ruminants in Perak, Malaysia.

In this study, 80 fresh liver samples from 67 Kedah-Kelantan crossbred cattle and 13 Murrah buffalo were inspected from 4 abattoirs in Perak (Ipoh, Taiping, Teluk Intan and Tapah). The samples were examined macroscopically after slaughtering from February 2013 to August 2013. All the suspected liver samples with damaged tissues identified during the meat inspection were stored at 4°C–6°C and transported to the Parasitology Laboratory of Veterinary Research Institute (VRI) for further examination using a stereomicroscope (Olympus SZ51, Japan). The flukes were then collected for species identification.

The flukes collected were identified according to their morphology by morphometric methods described for *Fasciola* by Periago *et al.* (2008).

There were 80 large ruminants examined and 6 (7.50%) animals were diagnosed with fascioliasis. There were 7.46% (5 of 67) and 7.69% (1 of 13) positive cattle and buffalo samples, respectively. The examinations revealed that only *F. gigantica* species were present.

The findings of this study show the prevalence of fascioliasis in large ruminants slaughtered in Perak is 7.50%. According to Pfukenyi *et al.* (2006) *F. gigantica* or giant liver fluke infection is one of the most common single helminth infections of ruminants in Asia and Africa. The adult fluke is oval and operculated with a thin shell and is slightly larger (up to 75 mm) than *F. hepatica* (up to 30 mm). The fluke also has clearly defined shoulders (Kahn *et al.* 2005).

The infected animals show a wide range in severity from an asymptomatic infection to a devastating disease related to the liver fluke burden. The parasites in the liver cause an uneven surface appearance with migratory

tracts that lead to liver condemnation during meat inspection. Infected animals may have reduced body weight, less weight gain, decreased in milk quality and reduced milk production (Chick 1980).

Fascioliasis was first documented in humans in 1970 during an autopsy of a female in Berlin, Germany (Groove 1990). The clinical manifestation of the disease includes fever, dyspepsia, anorexia, ascites, urticaria and jaundice in the acute stage. The chronic stage symptoms include nausea, fatty food intolerance, cholangitis, pancreatitis and cholecystitis (Khandelwal *et al.* 2008). Human fascioliasis is common in Cuba, Uruguay and Argentina. Humans are accidentally infected by eating green leafy raw aquatic plants that grow in fresh water such as watercress *(Nasturtium officinale)* containing encysted metacercariae (Saleha 1991).

To prevent the disease the population of intermediate hosts for *F. gigantica* should be controlled. The use of molluscicides can reduce the number of snails. Additionally, preventing livestock access to snail-infested pastures can decrease the potential of infestation. Human fascioliasis can be prevented by strict control of watercress and other metacercariae-carrying aquatic plants for human consumption. Consuming undercooked or raw liver dishes should be avoided because a study by Taira *et al.* (1997) stated that humans can be infected after ingesting immature flukes from raw dishes. The anthelmintic drug Triclabendazole is currently used to treat animals and human fascioliasis caused by both *F. gigantica* and *F. hepatica* (Mas-Coma *et al.* 2005).

In conclusion, fascioliasis, an important helminthiasis disease in large ruminants impacts human development. Although the prevalence rate in this study is low and there was no reported case of human fasicioliasis in Malaysia, precautions should be taken as the disease has a zoonotic impact.

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