Echinococcus granulosus hydatid cyst location is modified by Fasciola hepatica infection in cattle

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Background: Natural parasite infection occurs in wild and domestics animals with more than one parasite species at the same time, generating an infection called polyparasitism. Cystic echinococcosis reports are usually based only on infection with Echinoccocus granulosus leaving aside other internal parasitoses that could modulate both the immune response and pathogenesis of the natural infection. Fasciola hepatica is another cosmopolitan parasite in ruminants with a similar distribution to E. granulosus in different parts of the world, but no information of the effect of co-infection with E. granulosus has been described. The aims of this report were to establish E. granulosus prevalence and explore the association of F. hepatica co-infection and natural E. granulosus infections in cattle. Results: From 1725 animals, the prevalence of E. granulosus and F. hepatica was 21.16 and 51.3%, respectively. Considering both infections, older cattle (> 4 years) presented higher prevalence compared to younger animals. In E. granulosus-infected cattle, 5.21% had fertile cysts, 71.78% infertile cysts, and in 23.01% cysts were smaller than 1 cm in diameter. Considering cyst location, 39.72% had lungs cysts, 24.72% had liver cysts and 36.94% had cysts in both organs. Cyst location significantly differed between age groups: 44.68% of younger animals had cysts only in the lungs, while older animals presented hydatid cyst in the lungs and liver simultaneously (44.15%). With E. granulosus infection alone, 30.26% of cysts were found in the lungs, 31.79% in the liver and 37.95% in both organs. Regarding the co-infection of E. granulosus

with F. hepatica, the proportion was significantly different (P < 0.05) with most animals having cysts only in the lungs (49.41%) and a lower level of liver infection (15.88%). Analyzing organ cyst distribution and F. hepatica absence/presence ratio within each cyst type, small cysts showed the highest difference in ratio. Conclusions: To the best of our knowledge, this is the first report indicating that F. hepatica co-infection in cattle could be affecting the instate of hydatid cysts in the liver, displacing toward lung localization, suggesting an antagonistic relationship.

Echinococcus granulosus

Fasciola hepatica

Hydatid cyst localization

Polyparasitism

age

animal

bovine

cattle disease

cyst

echinococcosis

Echinococcus granulosus

Fasciola hepatica

fascioliasis

isolation and purification

liver

liver disease

lung

mixed infection

parasitology

physiology

prevalence

veterinary medicine

Age Factors

Animals

Cattle

Cattle Diseases

Coinfection

Cysts

Echinococcosis

Echinococcus granulosus

Fasciola hepatica

Fascioliasis

Liver

Liver Diseases

Lung

Prevalence