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Short communication

Epidemiological surveillance of ovine hydatidosis in Tierra del Fuego, Patagonia Argentina, 1997–1999

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Abstract

Cystic echinococcosis is the most prevalent zoonosis in Tierra del Fuego province, Argentina, with important economic, productive and public health consequences. The present work was performed to determine the ovine prevalence in Tierra del Fuego, Argentina, as well as to evaluate the quality of diagnostic systems in slaughterhouses. Moreover, genetic analyses to characterize the strain of *Echinococcus granulosus* involved in the region were done.

The first actions to perform a diagnosis of the epidemiological situation of hydatidosis in Tierra del Fuego were done between 1976 and 1977. A canine prevalence of 80% and an ovine prevalence of 55% results were obtained. Since 1979 the control program of Hydatidosis of Tierra del Fuego was implemented. It was based on semiannual canine anthelmintic treatment with praziquantel at dose of 5 mg/kg, and complemented with sanitary education and canine and ovine epidemiological surveillance.

During May 1997–January 1999: 5916 sheep coming from 20 farms of the programmatic area were evaluated. In the lamb category, hydatid cysts were not found. In the adults category, 62 infected animals were found (3.2%). The ovine prevalence was 1.1% and there was 100% of coincidence between diagnosis in the slaughterhouse, re-inspection in the laboratory and histopathological study. The marked decrease in the prevalence observed for sheep infection evidenced a destabilization of the biological cycle of the parasite. This could be explained by the application of a control program with uninterrupted systematic actions.

Polymerase chain reaction-ribosomal ITS-1 DNA (rDNA) restriction fragment length polymorphism (PCR-RFLP) analysis and partial sequencing of the mitochondrial cytochrome c oxidase subunit 1 (CO1) gene were used to characterize *E. granulosus* isolates collected from different regions of Tierra del Fuego to determine which genotypes occurred in this region. The results

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revealed the presence of the G1 genotype (sheep–dog strain). This is the first time that a molecular analysis was performed for the *E. granulosus* isolates from Tierra del Fuego.

Keywords: Hydatidosis; Prevalence in sheep; Control program; *Echinococcus granulosus*

1. Introduction

Cystic echinococcosis is the most prevalent zoonosis in Tierra del Fuego province, Argentina, with important economic, productive and public health repercussions (Bitsch and Zanini, 1987). This zoonosis is caused by *Echinococcus granulosus* which can establish itself in a wide range of intermediate hosts including cattle, sheep, pigs, horses and humans. The most frequent locations observed were the liver in cattle and horses and the lungs in sheep (Jubb et al., 1993).

The presence of hydatid cysts in commercial viscera is the main cause of seizure and it is responsible of great economic losses in regions with sheep husbandry (Galassi and Mazzini, 1985).

In Tierra del Fuego, before the implementation of the control program the unique slaughterhouse with official veterinary inspection was the one situated in Ushuaia, and the registered seizures of hydatidosis corresponded just to mature animals because lambs were exported. During 1970–1974, with a total of 19,085 slaughtered sheep, a prevalence of 52.5% was registered.

The first actions to perform a diagnosis of the epidemiological situation of hydatidosis were done between 1976 and 1977 and they consisted in the study of canine prevalence of *E. granulosus* using arecoline hydrobromide and ovine prevalence by post-mortem inspection in sheep farms (Bitsch and Zanini, 1987). A canine prevalence of 80% was evaluated by cordeladas (group of sheep dogs of a shepherd) or landlords, and an ovine prevalence of 55% were obtained.

During 1979, the control program of Hydatidosis of Tierra del Fuego was implemented. It was based on canine anthelmintic treatment with praziquantel at dose of 5 mg/kg twice a year: during spring and autumn. This metodology was used due to the impossibility of reaching the farms during winter months for climatic reasons. In summer and winter, the treatment was done by the farmers with praziquantel provided by the control program. The initial coverage of dogs of the programmatic area was 30% between 1970 and 1975. In 1980, it was 70% and, in the present it reaches the 95%. The anthelmintic treatment was complemented with sanitary education and canine and ovine epidemiological surveillance. Canine surveillance was realized by Dr. Amar Thakur every 3 years with 1% arecoline hydrobromide to evaluate the prevalence of adult *E. granulosus*. The control program was supported by the legal frame of Law 126 (1978) of ''Canine registration, possession (tenancy) and health'' which had a strong acceptation and commitment by the sheep farmers.

In 1982, the Municipal Slaughterhouse of Río Grande was inaugurated. It has municipal and national (SENASA: National Service on Health and Agro-alimentary Quality) official veterinary inspection, concentrates the major amount of slaughtered sheep of the province (mean: 45,000 sheep per year), and processes animals coming from all the sheep farms of the island. Due to the differences in the seizures registered by the official inspection, the control program trained its own personal and obtained its data since then.

The present work was performed to determine the ovine prevalence in Tierra del Fuego, Argentina, as well as to evaluate the quality of diagnostic systems in slaughterhouses. Moreover, genetic analyses to characterize the strain of *E. granulosus* involved in the region were done, taking into account that the advances of molecular studies of species and strains of *E. granulosus* had revolutionized the knowledge of the parasite (Cerrone and Targovnik, 2002).

2. Materials and methods

The work was executed in the Tierra del Fuego province, Patagonia Argentina. The Argentine sector of the Great Island comprised 21,571 km^2. The climate and the geography allow differentiation of three agro-ecological areas: the Magallanic steppe, the