3.3. Echinococcosis

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3.3.1. Echinococcosis

Human echinococcosis, known as hydatid disease, is caused by the larval stages of the small tapeworms of the species Echinococcus granulosus or Echinococcus multilocularis of the genus Echinococcus.

Echinococcus granulosus, the agent of cystic echinococcosis, produces unilocular human hydatidosis. E. granulosis is a small tapeworm (6 mm) that lives in the small intestine of dogs, foxes and other canids which are the definitive hosts. The adult tapeworm releases eggs that are passed in the faeces. Sheep, goats, pigs, cattle, horses and wild boar serve as intermediate hosts in which ingested eggs hatch and release the larval stage (oncosphere) of the parasite. Humans also can acquire infection by accidental ingestion of typical taeniid eggs, which are excreted in the faeces of infected dogs and foxes. When eggs are ingested by the intermediate hosts or by humans, the larval stages (oncospheres) liberated from the eggs migrate via the bloodstream to the liver, lungs and other tissues to develop hydatid cysts. These cysts may develop unnoticed over many years, and ultimately rupture. Clinical symptoms and signs of the disease depend on the location of the cysts and are often similar to those induced by slow growing tumours. Within these cysts brood capsules and protoscoleces develop. Each protoscolex is a potentially infective organism for canids. The definite hosts become infected by ingestion of these cyst-containing organs (of the infected intermediate hosts).

Indigenous unilocular hydatidosis in man has been sporadically reported in Belgium. Recommendations for basic risk-mitigation actions are destruction of contaminated viscera found at the slaughterhouse in order to avoid the infection of dogs.

Echinococcus multilocularis has a similar life cycle as E. granulosus. Foxes and to a lesser extent dogs are the definitive hosts of this parasite. Small rodents and voles are the intermediate hosts. Foxes are infected by ingestion of contaminated rodents. E. multilocularis is the agent of highly pathogenic alveolar (multilocular) echinococcosis in humans. Humans can be infected by ingestion of eggs. Alveolar echinococcosis is of particular public health relevance as it results in a chronic cancer-like liver disease. Ingestion of the eggs by humans can result in the development of invasive cysts in the liver. Most untreated cases in humans are fatal. In the intermediate hosts, the larval form of the parasite remains in the invasive proliferative stage in the liver, thus invading the surrounding tissues.

With regards to domestic animals, cats have been ruled out as hosts of E. multilocularis, since the parasite does not fully develop in their intestine.

Possible risk factors include contact with dogs hunting for game, and ingestion of contaminated water or contaminated unwashed fresh products (in particular raspberries and strawberries) and vegetables. Chewing grass is another practice to be associated with alveolar echinococcosis. Contamination of the hands during gardening, through contact with contaminated soil, may also carry some risk.

Recommendations to improve the protection of public health are the use of good general hygiene practices such as washing fruit and vegetables before consumption, cooking berries or mushrooms (washing alone is not sufficient, neither does freezing at -18°C!), hand-washing after gardening and before the consumption of meals. Also hand-washing after contact with dogs, especially if they have direct contact with wildlife or if they live in areas where wildlife, in particular, foxes, rodents or voles, is abundant. Planned treatment of dogs with taenicides and subsequent hygienic disposal of their faeces in endemic areas is recommended.

3.3.2. Echinococcus in animals

Surveillance programme and results

Post mortem macroscopic examination is done at the slaughterhouse in the Echinococcus domestic intermediate hosts: cattle, sheep, horses and pigs.

Whole carcasses or parts are rejected in case cysts are found.

No data are available for the reporting period.

3.3.3. Echinococcus in wildlife

E. multilocularis is known to be endemic in a wide area of central Europe. This area extends as far as the south of Belgium (Wallonia), the southeast of the Netherlands, the east of France and Switzerland.

In Wallonia, the cestode seems to maintain itself stably in the fox population. Between 2003 and 2004, 25% of 990 examined foxes tested positive (Hanosset et al., 2008). The highest prevalences (41 to 62%) are found in the Ardennes and Fagne-Famenne, areas which are rather densely forested and located at relatively high altitudes between 400 to 700 meters above sea level. The musk rat seems to be an important intermediate host.

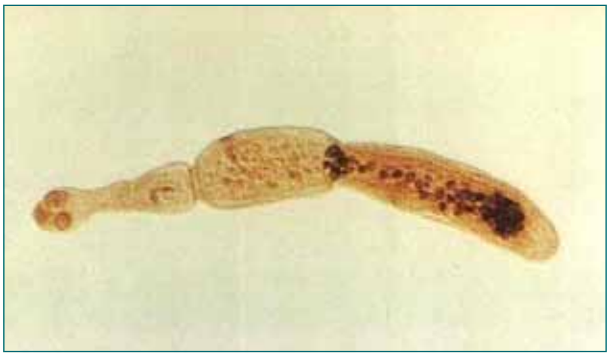

Figure 58. *Fox tapeworm (Source: Mikrobiologija Online)*

Figure 59. *Intestinal scraping technique (Source: WIV-ISP)*

According to a study performed in 2007-2008, the parasite remained rare in Flanders and Brussels. There was thus no proof of an increase in prevalence. In 2007-2008, 187 foxes form the regions of Brussels (n =56) and Flanders (n = 131) were examined by the WIV-ISP with the intestinal scraping technique. In Flanders, most foxes were healthy specimens that were shot during the hunting season. Storage of cadavers and sampling of the intestines was done by the Research Institute for Nature and Forest (INBO). In Brussels, most examined foxes were traffic victims that were deposited by police officers. Sampling was intensified in the south of Flanders and the southwest of Brussels. Indeed, in the southwest of Brussels 3 positive foxes were found during a former study in 1996-1999 (Vervaeke et al., 2003). None of the examined foxes from 2007-2008 carried E. multilocularis cestodes.

No prevalence studies or monitoring programmes were performed between 2009 and 2011.

The possible reasons for the difference in prevalence between the north and south are not known, but may include differences in altitude, climate, fox diet or low abundance of suitable intermediate hosts.

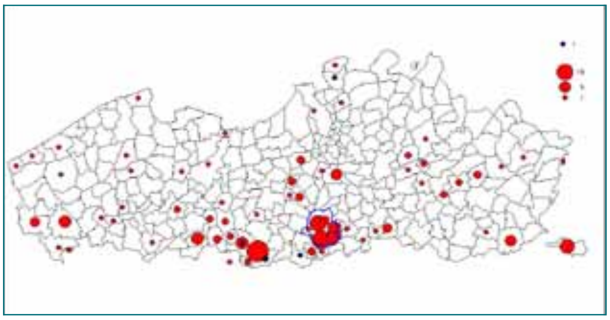

Figure 60. *Distribution of the foxes examined for E. multilocularis in Flanders and Brussels between 2007 and 2008. Each circle represents one to thirteen foxes. The red circles represent foxes examined between 2007 and 2008 All foxes were negative. The blue dots indicate the location of the four foxes which were found positive in a prevalence study in the same study area between 1996 and 1999 (adapted from Van Gucht et al., 2010, Zoonoses and Public Health).*

3.3.4. Echinococcus in humans

Till the end of 2003, 8 autochthonous cases of alveolar echinococcosis have been recorded. They concerned patients between 36 and 90 years old (4 males and 4 females). Two cases presented a rapid evolution due to immunosuppression. Two other cases were lethal due to surgical complications.

In 2004, a serological study among 115 forest guards (a specific risk group) working in Belgium (Wallonia) did not identify any suspected case of echinococcosis.

Since 2004, the NRL performs on average 250 to 300 serological analyses/year for antibodies against Echinococcus multilocularis. Interestingly, a slight tendency to an increased demand is observed. In screening tests using a crude antigenic extract, 3 to 7% of the samples are positive, i.e. 7 to 21 patients/year. More specific tests (in collaboration with the Institute for Parasitology of the Faculty of Medicine, Berne, Switzerland) show that most of these positive cases correspond in fact to cross reactions between Echinococcus multilocularis and Echinococcus granulosus, i.e. most of these patients suffer from hydatidosis produced by E. granulosus.

In 2010, one new case of alveolar echinococcosis and 7 new cases of hydatidosis were confirmed.

In 2011, two new cases of alveolar echinococcosis (one male and one female of 47 and 65 years old, respectively) and 11 new cases of hydatidosis (9 males of 21, 24, 27, 34, 35, 47, 56, 72, 88 years old; 2 females of 15 and 24 years old) were confirmed.