

CURRENT STATUS OF FOOD-BORNE PARASITIC ZOOSES IN MEDITERRANEAN AND AFRICAN REGIONS

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Abstract. Epidemiological data on food-borne parasitic zoonoses of Mediterranean and African regions are fragmentary. Several studies indicate that toxoplasmosis frequently occurs in Africa, but the epidemiological patterns in these countries are far from being complete. Serological investigations have been carried out with different methods and the results are not always comparable. Food habits, presence or absence of domestic and/or synanthropic felines, and environmental characteristics (damp or dry areas) seem to influence the prevalence of infection in man from 15 to over 60%. There are few reports on *Sarcocystis* infection in man, while its presence in domestic and sylvatic animals is well evidenced. Cysticercosis infection in cattle is widespread in Africa with a prevalence ranging from 2 to 50% in relation to breeding and human habits. In European countries of the Mediterranean area the prevalence of infection is below 2%. Cysticercosis infection in swine has almost disappeared in the Mediterranean area, while it is still present in some African countries. Human paragonimiasis is present in Western Africa with a prevalence ranging from 2 to 31%. Heterophyiasis in man is present in Egypt, Tunisia, and Middle East. Sylvatic trichinellosis is widespread in Mediterranean (*Trichinella sp.3*) and African (*T. nelsoni*, *Trichinella T8*) regions. Domestic trichinellosis (*T. spiralis spiralis*) is present in Spain, France, Yugoslavia, Egypt, Gambia, and Nigeria in domestic and/or sylvatic animals. In Africa human trichinellosis is rare, mostly from religious and food habits. Till now very few control projects against food-borne parasitic zoonoses have been developed in Africa.

INTRODUCTION

Reports on the epidemiology of food-borne parasitic zoonoses in Mediterranean and African regions have been carried out like spots of a leopard. Protozoa belonging to the genera *Sarcocystis* and *Toxoplasma* and helminths of *Heterophyes*, *Paragonimus*, *Taenia*, and *Trichinella* genera are the main etiological agents, considering only parasites whose infective stage occur naturally in food (WHO, 1979). The epidemiological surveys in man and animals were not carried out concurrently. Though the epidemiology of the above considered parasites is known, there is no country in Europe, as well as in Africa, where human infection modalities, incidence and/or prevalence were well investigated. The employed methodologies in epidemiological surveys change with time and authors, and consequently a comparison of the results cannot always be done. Many data were collected more than 20 years ago, and subsequently some reported studies of parasites were carried out in different places. At present in these countries the epidemiological situation could be

different from that reported in this paper.

Sarcocystosis

The prevalence of human *Sarcocystis* infection both as intermediate and final host in Mediterranean and African regions is unknown. There are two reports in the Mediterranean area (France, Italy), pointing out man as an intermediate host of *Sarcocystis* sp., and four reports in Africa south of the Sahara (Angola, Sudan, and Uganda) (Beaver *et al*, 1979). Sporocysts of *S. hominis* were detected in human feces of patients coming from West Africa. The prevalence of *S. hominis* and *S. suihominis* in domestic cattle and swine in these countries is unknown. Other *Sarcocystis* species were detected in animal muscles (donkey, mule, horse, and camel) in Africa, but their role in human pathology is unknown.

Toxoplasmosis

The prevalence of *Toxoplasma* infection in Europeans is related to the age, presence of cats, and food habits. In Africa it seems influenced by two

variables, ie, food habits and climate. High levels of temperature and humidity are factors influencing survival of oocysts and diffusion of the parasite in herbivorous animals and from these to man. Congenital toxoplasmosis appears to be rare in Africa south of the Sahara. A survey of more than 500 neonatal deaths from Kenyan hospitals did not show any case of the disease (Griffin and Williams, 1983). In European countries the source of infection seems related to cat oocysts in 50% of the cases, and to ingestion of raw infected meat in the others. The infection in domestic and sylvatic animals is between 11% and 77%. In the Niger Delta, all West Africa rodents were positive (Arene, 1986). In Kenya 79% of free-living carnivores and 82% of free-living herbivores were found to have *Toxoplasma* antibodies (Bakal *et al*, 1980).

Paragonimiasis

The lung fluke disease of man is present in West Africa. In Nigeria there is a prevalence of 16.8% in humans (Udonsi, 1987). Seasonal variation in crab populations and the level of crab infection are important epidemiological factors. Four foci of human paragonimiasis have been detected in Cameroon. All of them are located in the rain forest within the distribution area of *Potadoma*. The parasitological examination of sputum showed a prevalence of infection of 2.1-28.6% (Ripert *et al*, 1981). In West Cameroon, paragonimiasis was present in 10.6% of 265 examined persons (Vogel and Crewe, 1965). The infection was almost entirely limited to people aged from 10 to 30. Three species are considered etiological agents of pulmonary trematodiasis Africa: *Poikilorchis congolensis*, *Paragonimus africanus*, and *Paragonimus uterobilateralis* (Nozais *et al*, 1980).

Heterophyiasis

There are very few reports on the prevalence of heterophyid disease in Africa. Three trematode species were identified as etiological agents of heterophyiasis in North Africa. The main focus is in Egypt, where 229 human cases were reported, especially among old people, while this infection seems to be rare in children under 10 years (Sheir and Aboul-Enein, 1970).

Taeniasis and Cysticercosis

In Mediterranean countries of Europe, human taeniasis due to *T. saginata* is present in raw meat eaters but this infection does neither represent a serious health problem, nor an important economic loss in cattle. On the contrary Central and East Africa are highly endemic areas for *T. saginata* infection. Cysticercosis infection is reported in 38 African countries (FAO-WHO-OIE, 1989). Data concerning the prevalence of infection both in man and in animals have so far been limited and contradictory. In Ethiopia the 1982 report of the Veterinary Department of the Ministry of Agriculture showed a prevalence below 1% in 296,433 head of cattle, while in the same year about 3.5-4 million people were treated for human taeniasis (Teshager, 1987). Old reports, carried out from 1956 to 1959, showed a very high prevalence, over 80% in some areas, but some recent local surveys indicate that probably the epidemiological situation is still the same in the whole of Africa, or it appears to be increasing in some countries (Botswana, and Nigeria). In the Mediterranean area taeniasis and cysticercosis due to *T. solium* has disappeared in most countries. Very few sporadic cases were reported in Spain, France, Greece, Italy, Yugoslavia, Albania, and Egypt. On the contrary it is a very important food-borne disease in most African countries. In South Africa, 1.5% of the pigs were infected. In Bantu people, the massive infection seems to be caused by a local medicine prepared from tapeworm proglottids. In some Cameroon villages the prevalence of infection is about 50%, due to the people's habit of feeding human feces to swine (Marty *et al*, 1986). In Madagascar, 91 out of 34,137 people with neurological symptoms were diagnosed as cysticercosis cases. Cysticercosis infection occurs in 0.1-8.1% out of 20,200 pigs slaughtered in different regions of Zaire. In Zimbabwe human cysticercosis was recorded in 0.45% out of 2,148 autopsies (Gelfand, 1978).

Trichinellosis

Domestic trichinellosis due to *Trichinella spiralis* (T1) is present in Spain, France, Yugoslavia, and Egypt (Pozio *et al*, 1988); its distribution is influenced by human habits. Infected swine were also detected in Greece, Lebanon, Nigeria, Cameroon, Gambia and Guinea-Bissau but

parasites were not identified. The etiological agent of sylvatic trichinellosis in Mediterranean area is *Trichinella* sp. (T3). This parasite can infect domestic swine in contact with sylvatic cycle, but it is unable to maintain a domestic cycle. The main reservoirs are canidae (fox, wolf, etc) but frequently wild boars become infected (Pozio *et al*, 1988). Infected foxes and wild boars were also detected in Greece, Turkey, Morocco, and Algeria, but the parasite were not identified. Six epidemics caused by raw horse meat in Italy and France showed that herbivorous animals can be a source of infection for man. Also air-dried meat, bought as camel meat in Egypt, was a cause of human infection. In Africa south of the Sahara sylvatic trichinellosis is probably widespread in all countries. The main reservoirs are Hyaenidae, Felidae and Canidae, and the parasite can occasionally infect sylvatic swine. In equatorial Africa the etiological agent is *T. nelsoni* (T7), while in South Africa *Trichinella* sp. (T8). Human and animal infections were reported in Senegal, Ethiopia, Kenya and Tanzania (Pozio *et al*, 1988). Trichinellosis infected animals were also identified in South Africa, Zaire, and Gambia (FAO-WHO-OIE, 1989). Less than 100 human cases have been reported in Africa south of the Sahara, but probably numerous human infections are not diagnosed. This is due to the low pathogenicity of African *Trichinella* and to the absence of appropriate health services.

DISCUSSION

Other parasitic food-borne diseases, ie, linguatuliiasis and diphyllbothriasis, have been reported in Mediterranean and African regions, but they do not play an important epidemiological role. There is a strong epidemiological evidence that in Europe the prevalence of food-borne parasitic diseases is more or less ten times higher than reported in official reports. It may be assumed that in Africa too the prevalence of these infections could be higher than reported. Deeply rooted cultural practices and traditions often defy any change, even one aimed at improving health and well-being. Religious rituals and tradition in some geographical areas determine the occurrence or absence of some food-transmitted parasitic zoonoses, especially in African regions. Unfortunately, until now very few control projects against food-borne parasitic zoonoses have been developed in Africa.

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