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Balantidiasis a Potential Neglected Zoonotic Disease and the *liar paradox*

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A neglected zoonotic disease (NZD) could be defined as a disease transmitted from animals to humans,commonly associated with poverty thatimpacts the lives and livelihoods of neglected populations. The socioeconomic impacts of NZDs are expanding in the developing world, there is a major burden for poor rural communities[1]. Balantidiasisis not listed among the well-known NZDs, however, it shows all the key characteristics of NZDs.In fact, *Balantidium coli,*the etiological agent of balantidiasis,the sole ciliated protozoan that affect the gastrointestinal tract of humans, is transmitted by fecal-oral route in which contaminated drinking water or food are the mainroute of transmission. Inbalantidiasisexists a kind of "*liar paradox*", in fact, on one hand, based on the literature,*B. coli* could not be considered a public health problem because infections are usually asymptomatic andin humans, the overall prevalence is estimated to be 0.02 to 1%[2,3,4].On the other hand,some authors report that the parasite could invade the intestinal wall causing diarrhea, abdominal pain, nausea, vomiting, and in severe cases the death of the host[5];with an overallprevalence in endemic areas that reaches 30%[6,7]. What is the truth?The truth is that this parasitosis, due to the low pathogenic relevance, is often underestimated, both in human and animal populations.Considering the high prevalence in livestock and the pathogenic potential of this disease, it is mandatory to predict the appearanceof new balantidiasisoutbreak, especially in the poor rural scenario.Remarkably, the outbreaks of balantidiasis are strongly related to itspresenceinanimals hosts, being particularly exposed to people working with animals (i.e., veterinary, farmer and slaughterhouse worker), especially those in contact with pigs that,together with rodents, are the main reservoir of the disease[2,8]. Worldwide,the *B. coli* prevalence in domestic pigs ranges from 50 to 100% and the breeding system and related management practices are the main factorsinfluencing the infection rates[4,9,10,11]. In livestock, sanitation management of environment and animals ensure effective control of parasitic infection[9].

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In developing countries, this parasitosis could be a serious threat and its spread is related to the contamination of water and food sources with swine faeces, while in developed countriesrecreational water represents a further source of infection (i.e., in swimming pools, human-to-human transmission)[12].

Thepresence of *B. coli*cysts, revealed in faeces of slaughtered animals, raises concerns for food safety and public healthdue to the possible contamination of the carcasses[13]. During slaughtering, since *B. coli* inhabits the last intestinal tracts of animals, inadequate evisceration could determine meat contamination as well as poor hygiene practices could lead to cross-contamination among the carcasses.Under certain favourable conditions (i.e., cold chain failure), *B. coli*cysts could persist on the carcass surface along with the production chain exposing humans to infection by consumption of raw or undercookedmeat and meat products[14].

Furthermore, more attention should be paid to the hygiene condition during the domestic slaughtering of pigs frequently practiced in both developing and developed countries.

Overall,good manufacturing and hygiene practices would ensure effective management of *B. coli* risk along with the production chain, as well as the cooking of meat in the households.

Nowadays, despite the high prevalence reported in farmed animals and its zoonotic relevance, only a few and dated studiesinvestigated the occurrence of *B.coli* in foods which may represent a new and important transmission pathway, especially in the developed countries. Considering that the pathogenic relevance (i.e., from asymptomatic to severe clinical disease)of *B. coli* infection in humans is still poorly understood, it is mandatory to monitor the presence of this parasitosis and to update the information on *B. coli*prevalence in farm animalsin both developed and developing countries.

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