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Serological prevalence of human trichinellosis and cysticercosis in Hoa Binh province of Northwest Vietnam

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Introduction

In Vietnam, parasites that use pigs as intermediate hosts are a multifaceted concern, which we often call "neglected tropical diseases", typically trichinellosis and cysticercosis. According to the joint report of FAO and WHO in 2014, Taenia spp. ranks 1st and Trichinella spp. ranks 8th of 24 food-borne parasites assessed [1]. Trichinella spiralis has worldwide distribution and five outbreaks were recorded in Vietnam between 1970 and 2012, affecting between 20 and 36 people each [2-4] while there has been little recent research into rates of human taeniasis and cysticercosis in Vietnam due to the accurate national baseline figures do not exist [5]. Those diseases can vary across region and there are about 0,1-12,0% human affected by trichinellosis and cysticercosis according to estimated [6, 7] and indigenous pig was found with high antibody of T. Spiralis and T. solium of 12,5% and 28,5% respectively [8].

Exposure to those parasites primarily occurs through the consumption of raw or undercooked pork products [9-11]. However, transmission can also occur through the consumption of wild or omnivorous animals such as boars, dogs and rats [3, 10]. In addition, the driven factor could also be poor sanitation, pigs are allowed to roam freely (free-range), or meat inspection is absent or inadequate [12, 13]. Da Bac, Hoa Binh Province located in northwest Vietnam with the great amount of indigenous pig and the consumption of raw/uncooked pork has been quite ubiquitous in this area. By the aforemention reasons, this study was undertaken to assess the prevalence of and associated risk factors with human trichinellosis and cysticercosis.

Methods

A cross-sectional study was conducted in September 2018 in Da Bac district, Hoa Binh province. Six communes were randomly selected for sampling including Muong Chieng, Giap Dat, Doan Ket, Trung Thanh, Tan Minh, Cao Son. Those included in the study were member in household, aged between 18 to 65 years old and those who consented to have a blood sample taken as part of the research. Samples of serum were approximately 3-4 millilitres in volume, kept at 4 degrees Celsius during transportation and were preserved at -20oC in the laboratory. An enzyme-linked immunosorbent assay (ELISA) was utilised to identify the presence of antigens in samples. The formula to calculate results for each test were based in manufacturer's instructions.

Results

There are total two positive and four suspected cases of trichinellosis (2.0%), alongside two positive and one suspected case of cysticercosis (1.0%). Positive and suspected diagnoses in this study were relatively equal between genders, despite survey results indicating that men engaged in higher levels of risk behaviours, including the consumption of wild animals and undercooked pork. Noticeably, five of nine positive or suspected cases reported at Tan Minh commune (Table 1)

Discussion and Conclusion

On the one hand, the seroprevalence of trichinellosis (0,67%) and cysticercosis (0,67%) positive cases were in line with previous study in Vietnam [6, 7, 14] and Slovakia [15]. Low infection rates suggest that the disease may be circulating in the community but may also be the result of past infections, since antibodies produced may exist in the body for several years after being infected [16]. Moreover, positive and suspected cases concentrated mainly in Tan Minh commune, which is a warning sign of future outbreaks may occur surround this area. It poses urgency that in the future the commune authorities should have solutions such as human and pig screening and conduct treatment for positive cases.

On the other hand, the consumption of raw/uncooked pork has been quite ubiquitous in this area, which could facilitate the likely of Trichinella spiralis infection 3.5 times [17] and increase the risk of other parasitic diseases. In addition, less access to adequate sanitation such as not having toilet can increase the likely of cysticercosis 5.9 times [17] due to the fact that worm eggs from infect human and animal can be excreted through the feces to the environment. Improving hygienic condition can be a potential solution to prevent the spread of diseases.

Table 1: Risk factors associated with positive and suspected cases of trichinellosis and cysticercosis

	Trichinellosis						Cysticercosis		
Status (Positive/ Suspected)	Pos	Pos	Susp	Susp	Susp	Susp	Pos	Pos	Susp
Sex	F	M	M	F	M	F	M	F	M
Age	36	39	59	34	39	50	31	40	36
Ethnic minority	X	X		X	X	X	X	X	X
Access to adequate sanitation	X	X		X	X				X
Livestock producer	X	X	X	X	X	X	X	X	X
Consumed wild animal		X	X		X	X	X		X
Consumed raw vegetables		X	X	X	X		X		X
Symptoms in the last three months	X	X		X	X	X	X	X	X

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