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Research Article

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Risk Factors and Prevalence of Taeniasis among Displaced peoples in Ombadda Omdurman State-Sudan

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Abstract

Background: *Taeniasis is infection of human with intestinal cestode tape wormparasites belonged to the genus Taenia species saginata and solium.*

Objective: *The study aimed to determine the risk factors and prevalence of taeniasis among displaced peoples district in Ombadda Omdurman state- Sudan.*

Material and Methods: *This is a cross sectional study was conducted in Ombadda and Basheer hospitals in Omdurman-Sudan from the period September to November2021.A total of 150 stools samples were collected and examined using direct microscopy, formal ether concentration technique and Ziehl-Neelsen staining method fordetecting TaeniaSpp.*

Results: *A total of 150stools samples collected and examined, 10 (6.3%) out of 150 faecal samples were positive and 140 (93.7%) were negative sample. Out of 10 positive samples 6 (60%) were males and 4 (40%) were females their age groups range from 20 – 60 Years old, The Eggs stage of Taenia saginata and Taenia solium was identified by using direct microscopy and formal ether concentration t techniques and differentiated by the Ziehl-Neelson staining method.*

Keywords: Taeniasis, riskfactors oftransmission, displaced peoples.

Introduction

Taeniasis is infection of human with intestinal tapeworms cestode parasites belonged to the genus Taenia and It is a significant zoonotic disease [1] Because it may cause cysticercosis in the tapeworm carriers, family members, and other close contacts [2]. The most important human pathogen speciesin the genus-TaeniaareTaenia solium thepork tapeworm and Taenia saginata the beef tapeworm. The other speciesTaeniaasiaticais found only in east Asia [3]. Taenia saginata and Taenia soliun are worldwide distributed, taenia saginata found in the countries where cattle are raised awhile Teania solium is most common found in latin America, Southeast Asia and Africa practically prevalent in rural area where domestic pigs are found [4 ,5]. Human infected with Teania saginata and Teania solium when they consumption infected beef meats or pigs' liver which were poorly cooked and eaten [6]. These parasites have been complate in direct life cycle in two hosts, the definitive host was human which harbors the adult worm a while Porks and Cattles are intermediate host which was harbors the larval infective stage [7]. Eggs or gravid proglottids are passed with feces of human the eggs are highly infectious and can survive for days to months indifferent environmental sources [8]. Cattles and pigs become infected by ingesting vegetation contaminated with eggs or gravid proglottids. Taenia saginata and Teania solium consider to be like other several parasitic diseases cause mortality, T. solium cysticercosis is one of the most lethal parasitic diseases and is the most important foodborne Parasite [9]. In terms of health and economic burden, T. solium has been reported as the first, and Taenia saginata as the nineteenth foodborne parasite at the global level [10]. Taeniasaginata has a global distribution in Sudan than T.solium because it is considered one of the public health problem it is increasing mostly in the area where catles were arizing in community and if untreated causes economic burden and sever complication in human.

Material and Methods

this is a cross sectional study was conducted in Ombadda and Basheer hospitals in Omdurman State-Sudan from September to December 2021. A total of 150 faecal samples were collected in containers contain 10% formal saline as preservative reagents. were examined by microscopy and forma ether concentration as diagnostic methods, preserved faeses in formal saline wereemulsified and homogenized, one drop of emulsified faecse suspensions placed on a slide microscope, covered with cover class, examined microscopy by wet preparation technique, using the 10x objective and 40x objective of microscope lens for detecting segments and eggs of Taenia SPP in faeces. Using formal ether concentration method, 1g of faeces emulsified in 4 ml of 10% forma water in test tubes, 3-4 ml of formal water added further in test tubes mixed well, emulsified faeces sieved in beaker, 2-3 ml of diethyl ether added to the suspension and mixed in the test tubes, homogenate suspension was centrifuged at 750-1000 g for 1 minute and the sediment was examined microscopically by using the 10 X objective and 40 x to identify eggs and segment of Taenia Spp. The Eggs stage of Taenia saginata and Taenia solium was detected, identified and differentiated by the Ziehl-Neelson staining method.

Results

A total of 150 faecal samples collected from displaced peoples in Ombada hospitals Omdurman - state examined. 10 (6.3%) out of 150 faecal samples were positiveand 140 (93.7%) were negative samplesfor Taenia Spp (Table 1). The 10 positive samples that were seen in faecal samples Taenia saginata was 9 (90%) and Taenia solium 1 (10%) the eggs stag of Taenia Spp was identified using direct microscopy and formal ether concentration as diagnostic methods and differentiated by the Ziehl-Neelson staining method (Table3). Among these 10 positive samples 6 (60 %) were found to occur in males' and 4 (40 %) were found in female'spatients the difference was found to be statistically in significant (*P*.Value=0.454) as shown in (Table2). All patients came from displaced area their age groups range from 20 – 60 Years old and The age groups 31-40 to 51-60 Years old were most commonly infected by Taenia SPP this differences was found to bestatistically in significant (*P*. Value=0.425) (Table 2) The Infection rate decreased in Patients their jobs 1(10%) were students and 2 (20%) were non workersthis differences was found to bestatistically in significant (*P*.Value=0.566) in (Table 2). Patients jobs 5 (50%) Slaughters and 2 (20%) farmers were more susceptible to TaeniaSpp infection in both sexes than other occupied else where the differences was found to be statistically significant (*P*. Value 0.001) (Table 2). High infection rate occur in Patients had past history of eating under cooked meat of beef 9 (90%) and eating under cooked meats of pork 1 (10%) there was correlation association between Taenia SPP infection and peoples has cultural practices eating under cooked meat of beef and meat of pork the differences was found to bestatistically significant (*P*. Value 0.001) (Table 4). infection rate increased in patients not using toilet for defecation and decreased in patients using toilet for stool disposable (Table 4).

Table 1: Prevalence of Taeniasis among displaced peoples in Ombadda and Basheer hospitals Omdurman state.

No Examined	Taenia *SPP*		Total Number
	Positive%	Negative%	
150	10(6.7%)	140(93.3%)	150

Table 2: Demographic characteristics of 10 patients withTaeniasis in Omdurman state.

Variables	Taeniasis *SPP*		Total No	P-Value
Gender	T.saginat%	T.solium%		
Males	5(60%)	1(10%)	10 (100%)	0.454
Females	4 (40%)	0 (0%)		
Ages	9(90%)	1(10%)	10(100%)	
20-30	2(20%)	0(0%)	2(20%)	
31-40	2(20%)	1 (10 %)	3(30%)	0.425
51-60	5 (50%)	0(0%)	5(50%)	
Total	9(90%)	1(10%)	10(100%)	
Occupations	9(90%)	1(10%)	10(100%)	
Student	1(10%)	0 (0%)	1(10%)	0.566
Non workers	1(10%)	1(10%)	1(10%)	
Farmers	2(20%)	0 (0%)	2(20%)	0.001
Slaughters	5 (50%)	1(10%)	1(10%)	
Total	9(90%)	1(10%)	10(100%)	

Tables 3: Morphological differences between T. saginata and T. soliumeggs usingthe Ziehl-Neelson staining method in 10 patients in Ombada hospital.

Total of feacal examined	Taeniasispositive	the Ziehl-Neelson		Total no
		T.saginat	T.solium	
150	10	9(90%)	1 (10%)	10(100%)

Table 4: prevalence of taeniasis and associated risk factors in displaced peoples

History of eating raw meats	T.saginata	T.solium	Total No	P.Value
Pork raw consumption+ve (1)	0 (0 %)	1(10%)	9(90%)	
Beef raw consumption +ve	9(90%)	0(0%)	1(10%)	0.001
Total	9(90%	1 (10%)	10(100%	
Method of stool disposable				
Open defecation yes (8)	8 (80%)	0(0%)		
Using Toilet yes (2)	1(10%)	1(10%)		0.001
Total	9(90%)	1(10%)	10(100%)	

Discussions

The results obtained in the present study indicated that the overall infection rate of Taeniasis among the displace people was 6.4% this percentage results considered to be higher rate of infection when compared by previous study obtained by (Ghada etal., 2016) [11] found that (1.6%) in Sudan and higher than percentage results by (McCleery et al..,2015) [12] reported a low prevalence rate (2.9%) of taeniasis among refugees living on the Thai–Myanmar borderin Thailand andwere extremely lower when compared by previous results reported by(wongsaroi etal., 2014) [13] in Korea reportedthat 18.2% of Taeniasis among Korean people probably due to consumption raw meats or under cooked meats of beefs and porks which was containing infective stage of Taeniais. Our results in the present study showed that Taeina saginata infection rate was 9 (90%) and Taenia solium infection rate was 1 (10%) this indicate that Taenia saginata was more prevalent in displace people than Teania solium due to Muslim religion in the area and population raises cattle's houses, for food or for breeding. which was risk factor for taeniasis this results obtained when compared by previous study by (Anantaphruti etal., 2007) [14] in Thailand showed significant differences. When we analyzed the taeniasis infection in the gender, the prevalence rate was highest in males 6 (60%) and lower in females 4 (40%) the middle-aged groups ranging from 20–60 years old to 31–40 years old and51-60 Years old were most commonly infected by Taenia saginata this significant differences of a higher infection in males agreement with previous study by (Ng-Nguyen etal., 2018) [15] reported in highlands of Vietnamwhere it was noted that males has history of consumption raw meats and undercooked meats of beefs and pork's as cultural practices in dis place area. The results obtained showed thatthere are no Taeniasis infectionreported in children age group (< 20 Years old)this may be due to fact that the samples size of stools was collected in sufficient to declared that children are not in risk of infection by Taeniasis when compare this results with previous studies showed that highly significant differences has been reported by (Lit etal.,2019) [16] in China, (Madinga etal., 2012) [17] in Chan go and (Xud-M etal., 2010) [18] in Philippines reported that the highly Taeniasis infection found in children age group (< 20 Years old). In thepresent study the Infection rate of Taeniasis carriers decreased in Patients their jobs 1(10%) were students and 2(20%) were non workers this results agree with the previous results reported by (Openshawetal., 2018) [19] in western Sichuan, People's Republic of China and were predominantly occur in Patients their jobs 5 (50%) Slaughters and 2 (20%) farmers infection in both sexes than other occupied elsewhere this differences declared that the displace peoples a history of consuming raw or undercooked raw pork. , beef raw meats , working in corn fields and by cooking at their work places which was the most predominant risks factor for prevalence of Taeniasis similar results reported by (Swastikaetal., 2017) [20] in Karangasem Villages Indonesia .The present study showed that infection rate increased in patientshas history of passing stools outside their houses not using toilet for defecation and decreased in patients using toilet for stool disposable which pre-oral infection by Taenia eggs These are important risk factors of taeniasis when compared by previous results reported by (Ito etal., 2020) [21] showed similarity.

Conclusion

Taeniasis is the major public health problem mostly associated with those have poor hygiene habit, lack of meat inspection, bush defecation and poor waste disposable which has been considered risk factors for Taeniasis, slaughtering practices have contributed to the establishment and transmission of disease, Taenia saginata is more common and prevalent indisplaced people than Taenia solium,consumption under cooked Beef meats and pork meats has been hazardous and risk factors facilitated transmission of Taeniasis. The results obtained showed that the Ziehl-Neelson staining method used more effective in parasites differencation than other techniques used.

Conflict of interest

there are no conflict of interest.

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