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Epidemiology of Human *Taeniasis* among the People of Umunneochi Local Government Area of Abia State, Nigeria

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Abstract

This study on the epidemiology of human taeniasis amongst the umuchieze people of Umunneochi L.G.A of Abia State carried out between February and July, 2012 is reported. 197 or 19.7% of the 1000 persons examined infected. Of the 608 males and 392 females examined, 126 (20.7%) and 71 (18.1%) respectively had infections. No significant difference in prevalence rates was recorded between the sexes and age groups. Infection was significantly high ($P < 0.05$) among farmers than other occupational categories, and in those eating half roasted/cooked meat than in persons eating well cooked meat. Other epidemiological factors relating to type of toilet facilities used as well as some socio-cultural and traditional beliefs of Umuchieze people which determined host – parasite contact and their implications for public health are discussed. Suggestions and recommendations are made for control of human taeniasis in the community.

Keywords: Epidemiology, Human, *Taeniasis*, Umunneochi and Abia State

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Introduction

Human taeniasis is referred to the infection of human with *Taenia saginata* (beef tapeworm) and *Taenia solium* (pork tapeworm). Man becomes infected by eating under-cooked beef or pork containing viable *Cysticercus bovis* or *Cysticercus cellulose* or contaminated vegetables and dish wares which are the encysted larvae (bladder worms) of *T. saginata* and *T. solium* respectively. *Taenia saginata* is by far the most common in humans, occurring in nearly all countries where beef is eaten (Gerald D.S and Larry S.R 2010). Indeed the world prevalence of the disease has been variously estimated at 39 million (Stoll, 1947) and 77 million (Peters 1978). 32 million of these in Africa, 29 million in the former Soviet unions and 1 million each in Western Europe and North America. Azoro (2012) noted that the prevalence of the disease has been on the increase in several local government Areas of Abia State Nigeria due to the poor personal hygiene and consumption of under-cooked meat. According to Azoro, it was estimated that about 2.29% were infected with both species but while effective control measures have drastically reduced its prevalence in the United States and some parts of Europe, its prevalence in Africa and other tropical third world countries is increasing (Ukoli 1990). The effect of this disease on agricultural productivity is determined by the number of farmers infected.

Consequently, due to poor comprehensive control in tropical Africa, knowledge of the disease is fragmentary and limited (Okpala 1961, Nelson et al 1965). Even when such are documented, they are based on hospital records (Cowper 1966). Obviously, as hospital populations are highly selected, they do not constitute a valid representation of the entire population either of the communities or the entire nation. This study was therefore carried out to investigate the prevalence and epidemiology of human taeniasis amongst the people of Umuchieze in Abia State.

Materials and Methods

The study area comprises three villages in Umuchieze namely Leru, Lekwesi and Lokpanta in Abia state. The state has a total number of seventeen local government areas lying between co-ordinate $6^{\circ} 05'N$ and $4^{\circ} 50'N$ and $7^{\circ} 08'E$ and $8^{\circ} 00'E$. It has an estimated population of 2,833,999 persons based on the 2006 census provisional figures and a land mass of 7,627,20 square kilometers. The geological region of the community comprises the plateau and escarpment zones. The soil is clay with rich savannah vegetation. There are two distinct seasons: the wet and dry seasons. The rainy lasts between March and October with peaks of rainfall occurring in June and September with short August break. The mean temperature over most of Abia state is $25.5-26.5^{\circ}C$. The people lack some basic and social facilities such as good toilet systems and sewage disposal facilities which predisposes them to disease of parasitological importance. The majority of the inhabitants defecate in the farms and nearby bushes. There is no piped-born water in the community. The main water sources are from wells and streams whose surroundings are often polluted with faecal material. In addition, pigs and dog are reared by the inhabitants of the community. Furthermore, cow meat is obtained from Garki (Hausa based settlement) near the villages.

A survey of human taeniasis was made between February and July, 2012. Health orientation was given to the inhabitants with the help of Village Based Workers (VBHW). Information about each participant was obtained using a data form. The data form contained such information as sex, age, occupation, type of toilet facilities used, methods of cleaning up after defecation as well as meat preparation for consumption. Each participant was given a numbered specimen bottle and a sheet of clean paper. The procedure for introducing faecal materials into the bottle was clearly explained. At the collection centre, recovery of bottles with faecal specimens normally took about 12 hours. The specimen bottles were then cross-checked with the data forms. Faecal samples were preserved in 10% formal saline for laboratory observation. The Kato thick smear technique described by Okafor and Anosike (1989) and the formal-ether concentration method described by King (1973) were adopted for laboratory examination of faecal material.

Results and Discussion

The results of the examination of the Umuchieze community of Umunneochi, L.G.A between February and July 2012 shows that out of 1000 persons examined, 197 (19.7%) had tapeworm infections. The distribution of the infections among the various age groups and sex are shown in Table 1. While infections were recovered in all age groups, the peak prevalence of infection was recorded in the 51-55 years age group among the males and the 36-40 years group in the females. There was no statistical difference in the distribution of the infection among the various sex and age groups (chi-square test >0.05). Stool samples from a total of 1000 persons comprising 608 males and 392 females, aged between 5 and 56 years, were examined for taeniasis infections. The two types of toilet facilities available were bush and pit latrine (Table 2a). The two types of toilet facilities available were bush and the common pit latrine usually without a roof. However, some people make use of both bush and pit latrine (Table 2a). Persons using both bush and pit latrine were mostly affected (38.7%) followed by persons defecating in the bush (15.5%) while those defecating in the pit latrine were the least affected (11.4%). Distribution of taeniasis in relation to toilet facilities used showed a significant variation ($P < 0.05$). Table 2(b) illustrates the prevalence of human taeniasis in relation to method of cleaning up after defecation. Highest infection rate of 24.7% was observed in those who used leaves, followed by those who used paper 19.6% while the lowest infection rate of 13.6% was found in persons who used water to clean up after defecation. These variations are also significant at 95% level of probability.

As shown in table 3, differences were observed in prevalence of taeniasis ($P < 0.05$) in relation to type of meat consumed. Persons consuming half roasted / cooked meat were likely to be infected (26.4%) than those eating fully roasted / cooked meat (13.9%). Observations into the occupational related distribution of taeniasis amongst the studied Area shows that farmers (78) followed by house wives (51) students/pupils (50) were most likely affected than civil servants as the least (4). The details of infection with regard to occupational status are shown in table 4. Analysis of data

using chi – square test shows that there is a significant difference in the infection rate amongst the various occupational categories ($P < 0.05$).

Studies of human *taeniasis* in several parts of tropical Africa have reported prevalence rates of below 5% (Goldsmid & Plemine 1977; Okafor & Anosike 1989). Our observation, on the prevalence of human *taeniasis* amongst the Umuchieze people of Umunneochi LGA South Eastern Nigeria (19.7%) is quite high when compared with earlier observations by Okpala (1961) in south western Nigeria (2.1) or those of Cowper (1966) in South Western Nigeria (0.1%) and Katsina area of Northern Nigeria (2.4%) as well as those of Akogun (1989) in Bauchi State (1.4%) of Nigeria. However, when it is compared with studies in other parts of tropical Africa it falls within the normal range of between 8.3% in Chad Republic (Shabelink & Chechugo 1970; cited by Ukoli 1990) 10.5% in upper Volta (Ukoli 1990) to 14 – 65% in central Kenya (Froyn 1965) of course the high rate observed herein is not surprising considering the result from Goemaitribe of Northern Nigeria where prevalence rates was 11.5% (Dada et al) and 2.1% was documented by Opara (2007) in Owerri municipality, Imo State Nigeria. Indeed with the exception of Goemai, Owerri and Upper volta with over 10% prevalence most other countries have areas which are either free of infection (Nelson et al 1965, Bradley 1975) or have very low prevalence (Ukoli 1990). Differences in rates of infection are related to variations in climatic conditions and ethnological factors such as human occupation, habits, behaviours, religion and beliefs.

For instance the Umuchieze people are usually found in groups, after their daily activities, around the local market. They drink palm wine with roasted beef or pig and dog meat. Usually, their idea of roasted meat is that of half roasted type as traces of blood are easily seen on the chunk of the meat. In this, the mode of roasted meat is by arranging large chunks of meat on iron rods or sticks and placing them near a smoking fire when cooking their food. Evidence abounds that meat exposed in this fashion seldom attains a high enough temperature to kill the cysticerci. Similarly, Dada & Usman (1978) associated the habit of eating “Suya” – a kebab – like beef preparation and (Ukoli 1990) with increased incidence of human taeniasis in Northern Nigeria. The people of Umuchieze even believe that blood meat is a gastronomic delicacy. We also noticed that sex and age were not significant correlates of distribution of taeniasis. Nevertheless, the elderly males were more heavily infected which may be as a result of few of them being examined. Another explanation for high infection rate among the elderly may be due to the custom and tradition in Umuchieze area; adults who share the meat take special organs or regions such as tongue, liver, heart, masseter and high muscles. These organs in pigs and cattle have been observed as predilection sites (preferred organs) of the cysticerci (Petrovic 1976, Okafor. 1988). Therefore, due to cultural habits, elderly men who consume these parts of the meat are most likely to be infected if such parts are not properly roasted / cooked.

The high infection rate observed in the present investigation could be related to the poor personal and environmental hygiene evident in the area. Good toilet facilities are not available and only few people have pit latrines. Indiscriminate defecation around households and nearby bushes where pigs have direct access is a consistent habit. Persons using leaves and papers had high infection rates. Also such leaves and papers are scattered within the surrounding, on soils, in farms and houses where pigs and cattle can feed on them and the pastures where the grazing animals can also feed. It is important to note that while it has been fairly well established that wild animals do not play an important role in the transmission of *T. saginata* in eastern and southern African, the possible existence of a secondary cycle in wild animals still needs further investigation in West Africa (Ukoli 1990) Conversely other “bush meats” such as cats, monkey, and rats are known as intermediate hosts of *T. solium* infections in parts of Africa (Thornton & Goldsman 1969).

Conclusion and Recommendations

From findings of this study underlies the fact that indiscriminate defecation, food and feeding habits, amenities and awareness of the mode of transmission as well as low level of sanitation of the Umuchieze people are among the principal factors enhancing the transmission of human taeniasis in South Eastern Nigeria. This situation calls for effective control measures in the community. Perhaps, this can be achieved through community health education campaigns aimed at influencing the attitude and behaviours of the population at risks regarding the consumption of only well cooked beef/pork, maintaining a high standard of sanitation and treating diagnosed cases. A similar recommendation has been made by Dada (1993) The need for a well articulated taeniasis control programme for community like Umuchieze whose major health problems are rooted in their lifestyle and amplified by several contingencies of their social and physical environment is all too obvious.

References

- Akogun, O.B (1989), some social aspects of helminthiasis among the people of Gumau District Bauchi State, Nigeria – J. Trop Med. Hyg 92: 193-196.
- Azoro, A.V. (2012). An unpublished Ph.D Dissertation. Imo State University, Owerri. PP 58 – 59
- Cowper, S.G (1966): A Review of helminthiasis in the Western region of Nigeria with special reference to the Ibadan area – west Africa Med. J. 15 (6): 203 – 209
- Dada, B.J.O; Usman, S. (1978): The role of Suya in the epidemiology of human taeniasis in the Zaria area, Nigeria – Ann Trop Med. Parasitol 72 (3) 297-298
- E. O. Dada, C.M. Adeiyongo, J. C. Anosike, V.O. Zaccceaus, S. N. Okoye and E. E. Oto (1993) observation on the epidemiology of human taeniasis amongst the Goemai tribe of Northern Nigeria Appl. Parasitol. 34: (1993) 251 – 257 Gustav Fischer Verlag Jena.
- Gerald, D. Schmidt & Larry S. Roberts Foundations of Parasitology. Eighth Edition. MC Craw – Hill International Edition (2010) Pg 346 – 348.
- Goldsmid, J., Fleming, F. (1977). The tapeworm infections of children in Rhodesia – central Africa J. Med 23 (1): 7-10
- Hinz, E. (1966). Einfach und Mehrfachbefall mit Darmhelminthen in der Bevölkerung der westafrikanische Tropenregion – Z Tropenmed. Parasitol 17 (4): 427-442
- King, M. (1973) A medical laboratory for developing countries – Oxford (Elbs 1984 Oup)
- Nelson, G. S Pester, F.R.N Rickman, R (1965): The significance of wild animals in the transmission of cestodes of medical importance in Kenya – Trans. Roy. Soc Trop Med. Hyg 59 (5): 507-524.
- Ogunba, E.O. (1974): Intestinal worm infestation in Nigeria – J. Med. Pharm. Marketing 2 (3):10-12
- Okafor, F.C. (1988): Epizootiology of *Cyticercus bovis* in Imo State, Nigeria – Angew Parasitol. 29 (1): 25-30
- Okpala, I. (1961): A survey of the incidence of intestinal parasites amongst government workers in Lagos Nigeria – West Africa. Med. J. 10:148-157
- Onubogu, U.V. (1978). Intestinal parasites of school children in urban and rural areas of Eastern Nigeria- Zent. Bl Bakterol. Mikrobiol. Hyg (Orig.) 242: 121-131
- Opara F.N. (2007). The prevalence of Intestinal helminth infections in primary school children in Owerri municipality, Imo State Nigeria – Journal Parasitic Diseases: June 2007. Vol. 31. No 1, 00 -00.
- Peters, W.Z (1978) Comments and discussion on medical aspects in: The relevance of parasitology to human welfare today (Eds. A.E.R Taylor & R Muller) 16:25-40 Symp. Br. Soc. Parasitol.
- Petrovic, A. P (1976): On the incidence of *cysticercus bovis* in Tanzania – vet Glasnik 30: 709-713.
- Thornton, H; Goldsmid, J. M (1969): Taeniasis and cysticercosis with special reference to Rhodesia Central Africa J. Med. 15 (3) 47-52
- Ukoli, F.M.A (1990): Introduction to parasitology in tropical Africa – Ibadan, Nigeria (Textflow limited), pp.464.
- Veliath A. J; Ratnakar, C.; Thaukur (1988): Cysticercosis in south india – J. Trop. Med. Hyg. 1: 25-29

Tables

Table 1: Distribution of the infections among the various age groups and sex are shown in Umuchieze community of Umunneochi, L.G.A between February and July 2012

Age Group (years)	Male N0 examined	N0. (%) Infected	Female N0 examined	N0(%) Infected	Total N0 examined	N0 (%)Infected
0 – 5	20	6 (30)	14	2 (14.2)	34	8(23.5)
6 – 10	47	14 (29.8)	35	4 (11. 4)	82	18 (22.0)
11 – 15	54	18 (33.3)	39	9(23.1)	93	27 (29.0)
16 – 20	73	10 (13.7)	46	11(23.9)	119	21(17.6)
21 – 25	89	12 (13.5)	47	12 (25.5)	136	24(17.6)
26 – 30	83	14 (16.9)	44	6 (13.6)	127	20(15.7)
31 – 35	72	9 (12.5)	45	5 (11.1)	117	14 (12.0)
36 – 40	76	11 (14.5)	38	3(7.9)	114	14 (12. 3)
41 – 45	33	12(36.4)	26	4 (15 . 4)	59	16 (27.1)
46 – 50	36	11 (30.6)	30	7 (23.3)	66	18 (27.3)
51 – 55	15	6 (40.0)	14	6 (42.9)	29	12 (42.1)
56+	10	3 (30.0)	14	2 (14.2)	24	5 (20. 8)
Total	608	126 (20.7)	392	71 (18.1)	1000	197 (19.7)

Table 2(a): Prevalence of human Taeniasis in relation to type of toilet system used.

Toilet Facility	No examined	No Infected	% Infected
Bush only	335	52	15.5
Bush and Pit Latrine	253	98	38.7
Pit Latrine only	412	47	11.4
Total	1000	197	19.7

Table 2(b): Prevalence of human taeniasis in relation to method of cleaning up after defecation

Method	No Examined	No Infected	% Infected
Paper	296	58	19.6
Leaves	388	96	24.7
Water	316	43	13.6
Total	1000	197	19.7

Table 3: Prevalence of human taeniasis in relation to type of meat eaten

Type of meat eaten	No Examined	No Infected	% Infected
Half roasted / cooked	462	122	26.4
Full roasted / cooked	538	75	13.9
Total	1000	197	19.7

Table 4: Occupation Related distribution of the disease in the sampled population.

Occupation	No Examined	No Infected	% Infected
Farmers/Artisans	376	78	20.7
Traders	74	14	18.9
Civil Servants	59	4	6.8
Students / Pupil	267	50	18.7
House wives	224	51	22.8
Total	1000	197	19.7