Prevalence of Intestinal Parasites among Palm Wine Drinkers in Ibadan Metropolis

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ABSTRACT: A parasitological study was conducted among 203 apparently healthy looking palm wine drinkers within Ibadan metropolis to determine the prevalence of intestinal parasites. Stool and palm wine samples were collected and analyzed using wet microscopy together with formol-ether concentration method. Analysis of palm wine samples from 10 different palm wine joints sampled were negative for all forms of intestinal parasites. Of the 203 stool samples examined, only 12(5.9%) were positive to four parasites. The frequency of occurrences of intestinal parasites encountered were as follow: *Ascaris lumbricoides* (50.0%), Hookworm (33.4%), *Entamoeba histolytica* (8.3%), and *Strongyloides stercoralis* (8.3%). The highest prevalence of infection was recorded among the male palm wine drinkers [12(6.4%)]; no intestinal parasite was detected among their female counterparts. Age specific prevalence showed that infection was higher among age group 61-70 years of age (30.0%). Occupation specific prevalence showed that prevalence was higher among traders, military and civil servants with prevalence of 11.1, 10.0 and 8.3% respectively. It also showed that the prevalence of intestinal parasites was higher among the married subjects [10(6.8%)] than the singles [2(3.6%)]. In conclusion, there was no statistically significant difference between ages (p=0.700) and sex (p=1.048) of the subjects and the acquisition of intestinal parasitic infections. However, there was statistically significant difference between occupations (p=-0.222) and marital status (p=-0.178) of the subjects and the acquisition of intestinal parasitic infections. This study shows that a good percentage of palm wine drinkers were infested by intestinal parasites and reinforces the need for adequate health education is essential for the people in these communities to enlighten them on good sanitary practices in order to prevent infection.

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1.0. INTRODUCTION

Palm wine is obtained from the palm tree of the species *Eleas guineases*. It is a fermented product from the sap of the palm tree; a whitish, watery, foamy fluid often sweet in taste when freshly collected. Found almost every where in all parts of the country, it is more commonly savored by the Yorubas, Urhobos and Igbos at various joints in the evening after a day's work basically to relax. Owing to the sweetened taste of the drink, the joint no matter the degree of cleanliness is characterized by massive attendance of houseflies perching on the drinking glass. These houseflies (*Musca domestica*) are mechanical vectors carrying different infective forms of parasite at different stages of development through which they contaminate the drink. As a result, intestinal parasitic infections are likely to be transmitted to the drinkers thereby increasing the rate of spread of infection in the neighborhood.

Intestinal parasites invade and inhabit the intestine thereby causing discomfort to the host. They have been shown to cause poor appetite, intestinal abnormalities, poor adsorption or increased loss of nutrient which may result in protein energy malnutrition as to the role of intestinal parasites in malnutrition (Tomkin, 1990). Transmission via faecal contamination is the primary means of spread of all intestinal parasites; transmission also depends on a person eating food prepared in a manner that does not kill the infective form residing in the food (Sonnenwirth and Jarett 1980).

Food-borne exposure, especially when food handlers are shedding cysts or food is cultivated in faeces – contaminated soils, fertilizer, or water is another way of transmission of intestinal parasitic infections (Robert Sword, 2002). The distribution of the infection is related to more inadequate sanitation and poor personal hygiene than to climate (Tarimo *et al*, 1996). It is generally difficult to measure the sufferings caused by diseases in cases of intestinal parasitic infection because many cases of these disease are asymptomatic and therefore remain undetected (WHO, 1987a,b). Intestinal parasites can cause infectious diseases which are a major cause of

morbidity and mortality. Lack of sanitation, shortage of clean drinking water, poor standard of public and personal hygiene are responsible for the high prevalence. Intestinal parasites which can cause morbidity include *Ascaris lumbricoides*, *Trichrius trichuria*, Taenia spp (tapeworm), *Entamoeba histolytica*, as recorded in Nigeria (Onadeko and Ladipo, 1989).

In developing countries, both chronic alcoholism and intestinal worms are common, but the frequency and severity of the worm infections in palm wine drinkers (alcoholics) have not been studied (Ogilvie *et al*., 1998). Alcoholism and intestinal infections are common, as ethanol abuse induces behaviour changes that enhance contact with infectious agents. Genta (1992) raised the hypothesis that glucocorticoids and corticoids metabolites would enhance the fecundity of helminthes females in duodenum and the maturation of rhabditiform larvae in the gut. He based this on the fact that disseminated worm infections are more frequently associated with use of corticoids than with other kinds of immunosuppression. The ecdysteroids hormones that regulate ecdyses in larvae of helminthes and other invertebrates, have structural similarities with corticosteroids and other steroid metabolites detected in human serum of normal, non-parasitised individuals. Thus, an increased level of corticoids or its metabolites would mimic the ecdysteroids, increasing the fecundity in females and the maturation of larvae from rhabditiform to filariform stage, thereby enhancing autoinfection. The role of houseflies as mechanical vector in transmission of the disease can never be over-emphasized (Ogunba, 1977).

The aim of this study is to determine the prevalence of intestinal parasites among palm wine drinkers and to determine the frequency of each incriminating parasite and also to recommend prevention and control of intestinal parasitic infections.

2.0. MATERIALS AND METHODS

2.1. Study area

The study was carried out in about 10 different palm wine joints at various local governments within Ibadan metropolis. These include Ibadan North LGA, Ibadan North LGA, Ibadan North EAST LGA, Lagelu LGA and Akinyele LGA.

2.2. Study population

A total number of 203 apparently healthy looking palm wine drinkers were sampled. All the participants [188 males and 15 females] with different occupations and eating habits did not take treatment for intestinal ailments within the three months prior to this study. A structured questionnaire was used for collecting information on sex, age, occupation, clinical history and soon. An informed verbal consent was obtained from the participants having explained the objectives of the study to them together with the questionnaire.

2.3. Sample collection

Stool samples were collected from each of the palm wine drinker who was given a clean, wide-mouthed universal container with tight fitted lid. Code number, age and sex were written on the sample bottle and sent to the laboratory for analysis.

2.4. Stool Analysis

A drop of normal saline and iodine solution was added each to the center of separate clean grease free glass slides with the aid of Pasteur pipette. Small portion of the stool sample was emulsified (with the aid of applicator stick) in the saline and iodine solution on the glass slides respectively. Both were covered with cover slips and examined under x10 and x40 objectives of the microscope with the condenser iris sufficiently closed to give good contrast. Of the various concentration methods, formol ether concentration technique was used. About 1g of faeces was emulsified in 4ml of 10% formol water. 3ml formol water was further added. The tube was capped tightly and mixed well by shaking. The emulsified faeces were sieved and the suspension was collected in a beaker. The suspension was transferred to a centrifuge tube and the stopper was loosened (to release the pressure inside). The tube was centrifuged at 3000rpm for 2 minutes. The faecal debris from the side of the tube was removed with the aid of an applicator stick, the formol water; ether and faecal debris were discarded by inverting the tube. The bottom of the tube was tapped to re-suspend and mix the sediment. The sediment was transferred to a slide, covered with a cover slip and examined at x10 and x40 objectives with the condenser iris closed sufficiently to give good contrast (Cheesbrough, 1998).

3.0. RESULTS ANALYSIS

Of the 203 stool samples from palm wine drinkers, 12(5.9%) samples were positive for intestinal parasites. Four intestinal parasites namely; *Ascaris lumbricoides*, Hookworm, *Entamoeba histolytica*, *Strongyloides stercoralis* were detected in the 12 positive samples. Table1 shows the frequency of occurrence of these incriminating parasites. It showed that *Ascaris lumbricoides* 6(50.0%) was the most predominant, followed by Hookworm [4(33.4%)]. *Entamoeba histolytica* [1(8.3%)] and

Strongyloides stercoralis [1(8.3%)] was the least prevalent.

Table 1: Frequency of incriminating parasites

Parasites	Frequency (%)
Ascaris lumbricoides	6(50.0)
Hookworm	4(33.4)
Strongyloides stercoralis	1(8.3)
Entamoeba histolytica	1(8.3)
Total	**12(100.0)**

Table 2 shows the prevalence of intestinal parasites in relation to sex. It showed that of the 203 samples tested, 12 samples (5.9%) were positive for intestinal parasites. However, intestinal parasites were present only in males [12(6.4%)]. However, there was no statistically significant difference (p=1.048) between sexes of the subjects and the acquisition of intestinal parasitic infections.

Table 2: Prevalence of Intestinal Parasites according to sex

Sex	No. Tested(%)	No. Positive(%)	*p*- value
Females	15(7.4)	0(0.0)	1.048
Males	188(92.6)	12(6.4)	
Total	**203(100.0)**	**12(5.9)**	

Table 3 shows the prevalence of intestinal parasites in relation to the marital status of palm wine drinkers in Ibadan. It showed that the prevalence of intestinal parasites was higher among the married [10(6.8%)] than the singles [2(3.6%)]. However, there was statistically significant difference (p=-0.178) between marital status of the subjects and the acquisition of intestinal parasitic infections.

Table 3: Distribution of Intestinal parasitic Infection according to marital status

Marital Status	Frequency (%)	No Positive (%)	*p*-value
Married	148(72.9)	10(6.8)	-0.178
Single	55(27.1)	2(3.6)	
Total	**203(100.0)**	**12(5.9)**	

Table 4 shows the prevalence of intestinal parasites in relation to ages of the subjects. It showed that infection rate was highest among age groups 61-70 years of age. This was followed by 11 – 20 years (16.7%), 31 – 40 years (7.1%), 51 – 60 years (4.8%), 41 – 50 years (2.9%) while 21 – 30 years (1.6%) had the least prevalence. However, there was no statistically significant difference (p=0.700) between ages of the subjects and the acquisition of intestinal parasitic infections.

Table 4: Prevalence of Intestinal parasites in relation to Age

Age (years)	No. Tested (%)	No. Positive (%)	*p*-value
11-20	6(3.0)	1(16.7)	0.700
21-30	61(30.1)	1(1.6)	
31-40	70(34.5)	5(7.1)	
41-50	34(16.8)	1(2.9)	
51-60	21(10.4)	1(4.8)	
61-70	11(5.4)	3(30.0)	
Total	**203(100.0)**	**12(5.9)**	

Table 5 shows the prevalence of intestinal parasites in relation to occupation. It showed that traders had the highest frequency of infection (11.1%). This was closely followed by the Military and Civil servants with prevalence of 10.0% and 8.3% respectively. of was recorded among the drivers while the Self-employed and Unemployed was least, having prevalence of 3.5% and 2.3% respectively. None of the drivers examined was positive for intestinal parasites having zero prevalence (0.0%). However, there was statistically significant difference (p=-0.222) between occupations of the subjects and the acquisition of intestinal parasitic infections.

Table 5: Distribution of Intestinal Parasitic Infection/ Relative positivity According to Occupation

Occupation	No. tested (%)	No Positive (%)	*p*- value
Civil servant	36(17.8)	3(8.3)	-0.222
Driver	28(13.8)	0(0.0)	
Military	30(14.8)	3(10.0)	
Trader	36(17.8)	4(11.1)	
Self employed	29(14.3)	1(3.5)	
Unemployed	44(21.7)	1(2.3)	
Total	**203(100.0)**	**12(5.9)**	

4.0. DISCUSSION

Of the 203 samples examined in this work, 5.9% were positive. This shows that there is a low infection rate compared to past related studies to those not drinking, (the study carried out by Warison and Ibe (1994) on the prevalence of intestinal parasite within part of Port Harcourt showed that out of 747 samples examined, 46% were positive). Bray *et al*., (1977) conducted a survey on the prevalence of Amoebiasis in the Gambia and indicated a range of 13.7% in the Northern part and 53.3% in the Southern part. Their results compared with the above work shows that people are taken personal hygiene and environmental sanitation into cognizance.

Helminthiasis has a higher prevalence than Amoebiasis. Helminthiasis has a frequency of 5.4% while Amoebiasis has 0.5%. This in accordance with studies conducted by Warison and Ibe (1994) showed that *Ascaris lumbricoides* was the most prevalent helminth of their time. The high infective rate of

Helminthiasis compared to Amoebiasis may be attributed to environmental factor; the environment may be contaminated with faeces, but since it requires about 30-40 days in the environment (or less in higher temperature) for egg to mature to the infective stage, few people might be infected with Helminthiasis especially if the non-infective ova are ingested in food or from contaminated hand.

There was a significant relationship between intestinal parasites among palm wine drinkers and sex; males were found to be positive to all the parasites encountered, whereas no female was positive. In the same vein, infection was more among the married than the single. Males had more infections than females, similar to the observations of most authors in other endemic foci in Africa (Anosike et al., 2005; Okonko et al., 2009). This is in line with the findings of Anosike et al. (2004) who also reported that parasitic infections were significantly higher in males than females in a similar study among the nomadic Fulanis of south-eastern Nigeria. Results reported by Adeyeba and Akinlabi (2002) and Baldo et al. (2004) also showed that infection rates for intestinal parasites were higher in males than females. Chukwuma et al. (2009) reported prevalence of parasitic infection to be higher in females 91.6% than in males 83%. On the contrary, Awolaju and Morenikeji (2009) reported that overall infection rate was higher in females but not statistically significant among primary and post-primary schools children Ilesa West, Osun State. Nkengazong et al. (2009) also showed that differences in prevalence values of parasites between the sexes in Kotto Barombi and in Marumba II were not statistically significant. Previously, Saathof et al. (2004) in KwaZulu-Natal/South Africa, and Tohon et al. (2008) in Nigeria also claimed that parasitic infections were not sex dependent. These are also contrary to our finding.

Infection rate was highest among ages 61–70yrs (30%). This was followed by ages 11-20yrs (16.7%) when relative positivity was put into consideration, unlike when frequency of infection was considered and age group 31-40yrs was more. This might be due to habits as well as poor or lack of environmental sanitation especially where people eat or drink. Also, low body immune system especially as concerned ages 61–70yrs might be responsible for infection rate (Sorensen *et al*., 1996).

In this study, the most prevalent parasite was *Ascaris Lumbricoides,* 6(3%) followed by Hookworm, 4(2%). *Strongyloides stercoralis*, 1(0.5%) and *Entamoeba histolytyca*, 1(0.5%) occurred at the same frequency respectively. Although there was no significant relationship between the palm wine itself and the infection, as no oocyst of Cryptosporidium, nor cyst, nor ovum of parasite was isolated from the palm wine samples analyzed, it is however known that induced behaviour from the effect of the palm wine enhances the possibility of infection (Genta, 1992). From the foregoing, it thus means that individual participants might have contacted the infections from other sources than palm wine. Houseflies (*Musca domestica)* are common sight at palm wine joints and these, being mechanical vectors convey the infective forms of the parasite from the polluted environment and contaminate drinks, causing infection.

5.0. CONCLUSION

The investigation through this study reveals that intestinal parasites still play a major role in gastrointestinal tract infection with an incidence of 5.9%, although with low incidence compared to previous studies. *Ascaris lumbricoides* remains the most prevalent intestinal parasites. Since this has been attributed to environmental factors, concerted effort should be made at reducing it to the barest minimum if it cannot be totally eradicated: this include covering of food and water to prevent contamination from *Musca domestica*, washing of green salad or uncooked food which may contain infected cysts or ova before eating and washing of hands before and after eating food and especially after visiting the toilets.

It is however recommended that individuals should take preventive measures seriously by increasing the level of their knowledge about personal and community health. Good sanitary and hygienic practices should also be improved upon. Food handlers, in this case, palm wine tappers as well as sellers should improve on their personal cleanliness to prevent transmission of infection to their customers. They should ensure the palm wine joints are as clean and tidy as possible in order to reduce the number of flies that frequent the place. They should at all times ensure the water which they use to dilute down the original palm wine is pure and healthy for human consumption. The government as well should through public awareness campaign, educate the populace on the need for adequate environmental sanitation. They should also improve on the current water supply, a well planned housing scheme with modern facilities and increase subsidy on fertilizers in order to discourage farmers from using faeces as fertilizers. If these strategies are put in place, intestinal parasites would be almost eradicated in the nearest future.

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