

Original Research Article

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Public Health Implication of Intestinal Parasites Recovered from Stool Samples of Food Handlers and Vendors in Calabar Municipality

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ABSTRACT

Keywords

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The stool sample of one hundred (100) food handlers and vendors in Calabar municipality were processed for the presence of intestinal parasites. The samples were processed by direct wet mount and formol-ether sedimentation technique. Fifty three (53) food handlers were found to be infected with one or more intestinal parasites, which forty three (43) has no intestinal parasitic infection whatsoever. The most frequently identified parasite was *Entamoeba* at 18%, followed by Hookworm (15%), which the least is *Giardia lamblia* (4%). The need for hygiene by food handlers and oversight by government agencies is recommended.

Introduction

For centuries stool parasites have been a source of health concern to man (Cox, 2003). Their ubiquitous nature increase their relative ease at which this parasites are picked up from the environment by man (Vanessa and Matthew 2008). We live with over 300 species of helminthes and 70 species of protozoa, many of whom are rare and accidental parasites.

The relatively slow pace at which humans have evolved in hygiene, public and environmental health has given rise to the convenience of infestation among many

parasites (Theodore and Elena, 2014). In most parts of the developing and under-developed world, personal hygiene is secondary to the daily primary struggle to live, due to extreme poverty. In such cases sanitary conditions are given the backseat, giving parasites the opportunity to thrive and infect as many persons as possible in any given time (Elena, 2014), hence the outbreaks of diarrhea, dysentery etc. It is therefore instructive to note that the spread and distribution of parasites throughout the world has been to a large extent a result of human activity (Amuta and Houmsou, 2009). A food handler is one who prepares and processes food in readymade form for the consumer and plays a vital role in

the chain of producing, processing, storage and preparation of food (Italo *et al.*, 1999) infected food handlers pose potential public health hazard as intestinal helminthes and protozoa may be passed on to unsuspecting clients or food consumers (foodstandards.gov.au.com, 2018). Intestinal parasites have been found to adhere to vegetables, fruits, fingernails, etc. (Fitsum *et al.*, 2017). It is therefore possible that improperly washed food items and materials could result in food contamination (foodsafety.gov.au.com). personal hygiene is therefore is equally of outmost importance for food handlers as it determines the microbial quality of food presented to the public personal hygiene is indeed the third most important factor when considering food preparation safety as reported by the Centre for Disease Control (CDC), 2018.

Materials and Methods

Area of study

The work was carried out in Calabar Municipality, one of the two local government areas which make up Calabar Metropolis it is an urban setting with most dwellers being civil servants, it is bounded on the north by Odukpani L.G.A on the South by

Calabar South L.G.A. One hundred (100) stool samples were collected from one hundred food handlers selected by random sampling. The informed consent of participants was sought before collection.

A two part structural questionnaire was also employed in obtaining vital information from participants concerning their biography and their views on healthy lifestyle. The stool samples collected were immediately transported to the laboratory for analysis. The samples were analyzed for intestinal parasites using the formol- ether concentration techniques as described by Monica Cheesbrough (2000) and the wet preparation, direct moment technique as described by Monica Cheesbrough (2000). Samples were microscopically examined using the 10x and 40x objective lens.

Results and Discussion

One hundred stool samples were collected from food handlers in Calabar Municipality. Fifty seven (57) samples of food handlers were found to contain one or more intestinal parasite while forty three (43) were free of intestinal parasites. The results are presented in the tables below (Table 1–7 and Fig. 1).

Table.1 Showing prevalence of intestinal parasites in food handlers according to age distribution

Variables	Age distribution						Total
	6-15	16-25	26-35	36-45	46-55	56-65	
Infected food handlers	4	6	13	17	15	2	57
Non infected food handlers	4	14	5	9	9	2	43
Total	8	20	18	26	24	4	100

Table.2 Showing distribution of parasites by gender of food handlers

Gender	No. not of infected person	No of infected persons	Total
Female	24	38	62
Male	19	19	38
Total	43	57	100

Table.3 Showing occurrence of parasite in food handlers in big outlets (fast foods), small outlets and food hawkers

Outlets	No. not of infected person	No of infected persons	Total
Big outlet (fast food/franchise)	17	6	23
Small outlet	7	20	27
Hawkers	19	21	50
Total	43	57	100

Table.4 Showing parasite distribution according to source of water supply available for food preparation

Source of water supply	No. infected	No. not infected	Total
Stream	32	18	50
Tap (Borehole)	16	19	35
Well	9	6	15
Total	57	43	100

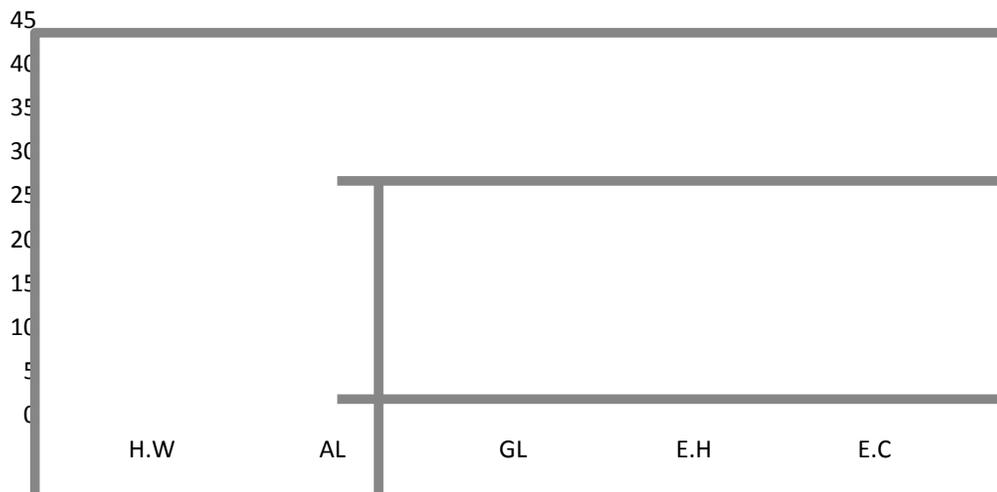
Table.5 Percentage frequency of infection by different intestinal parasites

Parasites	Frequency (%)
<i>Hookworm</i>	15
<i>Ascaris Lumbricoides</i>	11
<i>Giardia Lamblia</i>	4
<i>Entamoeba histolytica</i>	18
Entamoeba coli	9
Total	57

Table.6 Showing parasitic infestation among food handlers by number of infestation

Parasitic infectivity	No. infected	Percentage (%)
One parasitic infection	25	43.9
Two parasitic infections	15	26.3
Three parasitic Infections	10	17.5
Four parasitic infection	7	12.3
Total	57	100

Fig.1 Percentage frequency of infection by different intestinal parasites



Stool samples of one hundred (100) food handlers in Calabar Municipality were analyzed for intestinal parasites fifty seven (57) samples showed the presence of one or two parasites while forty three (43) samples did not have intestinal parasites. The number of positive samples weighs greater than that of negative samples showing that there poor hygiene among a large number of food handlers in Calabar Municipality. This is of great concern given that the possibility of food infestation within the municipality is very high (CDC, 2018).

The study showed that more female food handlers (61.4%) than male food handlers (38.6%) were infested with parasites. That shows that adherence to and knowledge of

requisite hygiene practices is higher among the male food handlers than female food handlers. This finding however conflicts with the findings of Tobias (2012) who stated that the females had far less parasitism than their male counterparts because of their natural role in food handling and the copious information at their disposal.

Table 1 shows that food handlers aged between 36-45 years had the greatest parasitic burden (26%) which may not be unconnected with hygiene behaviours. The rate of infestation is higher in this study than when compared to that of Okore *et al.*, (2009) which was 18% variations in the parasite burden or infestation may be due to socio-economic status, low literacy and lack of

health and hygiene education (Mulugeta and Bayen, 2012). The study shows that food hawkers were more infected with intestinal parasites, followed by food handlers in small outlets while the least infected were food handlers in fast foods or food franchise. The levels of contamination among food hawkers and food handlers in small outlets (canteens) are traced to the fact most of these food handlers are untrained, ignorant of simple hygiene principles and uneducated (Hezekiah *et al.*, 2015). Most fast food joints engage educated and well trained food handlers or undergo training when engaged (Valerie, 2008). Food handlers who used stream water were more infected than those who used borehole and well water. The reasons are not farfetched as stream water is easily polluted and contaminated with run-offs from surrounding environments and activities of wild animals. This goes to confirm the work of Ejezie *et al.*, (2008) who reported that during dry seasons people visit streams often to fetch water making parasitic infection more common at such times.

Protozoan infestation (36.7%) was more common in this study than helminthic infestation (8.6%) as shown in table 5. A related study in Jos, Nigeria by Ogionwo *et al.*, (2010) showed a much lower prevalence of intestinal protozoan parasites. This may be a result of demographic and environmental differences between the two areas of study.

The higher prevalence of *Entamoeba histolytica* (*E. histolytica*) than other parasites as shown in this study may be due to the ease of its transmission through food and water contamination (Ejezie, 2006). This study reports multiple parasitic infections with over 56.1% of food handlers having between 2 and 4 parasitic infection while 43.9% of food handler had only one parasitic infecting them. This is corroborates the work of Okoro *et al.*, (2009) who also reported a high level of multiple parasitic infection in a study

relationship between infant feeding practice by mothers in Aguowa village near Enugu in Nigeria.

In conclusion the study has confirmed a high level of intestinal parasites (57%) among food handlers in Calabar Municipality. *Entamoeba histolytica* had the highest prevalence (18%) while *Gardia lamblia* look the least (4%) female food handlers were more infected than male food handlers and respectively multiple parasitic infection was recorded and hawkers of food were more infected than food handlers in small outlets and fast food franchise. Users of stream water had more parasitic infection than users of tap/borehole or well.

Recommendations

The following recommendations are made to curb the relatively high rate of intestinal parasitic infection among food handlers in Calabar Municipality.

All food handlers should be mandated to go through basic medical examination from time to time.

Government agencies tasked with the responsibility of monitoring food safety and hygiene must be up and about their duties.

Food handlers should undergo basic training in hygiene and environmental care before certification as food handlers and regular retraining is required.

Provision of portable water by Government should be a priority project.

Waste collection and disposal must be carried out more effectively.

Food should be protected from flies, cockroaches, fowls dogs etc.

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