

Assessment of Incidence and Association of Intestinal Parasites with Demographic Details among Food Handlers

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ABSTRACT

Background: Occurrence of parasitic population is often used as a measure for assessing oral hygiene status and index among humans. A variety of debilitating diseases affect Asian, African and American population significantly more than humans of other parts of the world. Few of the major factors which determines the level of food contamination is the hygiene practice and oral health status of food handlers. Improper rules and pathways are followed while recruiting these food handlers before assessing their hygiene and health status in most of the developing countries. Hence, we conducted the present study to assess the incidence of intestinal parasites among food handlers.

Materials & Methods: The present study included assessment of 180 various food handlers working in the kitchens of the various food services centres. A questionnaire was framed by skilled and experienced health care professionals for the collection of the personal details and demographic data of the subjects. Records regarding the shoe wearing practice and finger nail trimming were collected and analysed. Stool specimens were collected from food handlers and were sent to laboratory in an air tight container for assessment. Assessment of the parasitological profile of the specimen was done.

Results: *A. lumbricoides* was the predominant intestinal parasite observed in the present study. While comparing the positive patients divided on the basis of status of figure nails and washing of hands after toilet, significant results were obtained.

Conclusion: Frequency of occurrence of intestinal parasites among food handlers is very high.

Key words: Food Handlers, Intestinal Parasites.

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INTRODUCTION

Different parasites of the world come in routine contact with the general population of the world. Occurrence of parasitic population is often used as a measure for assessing oral hygiene status and index among humans.¹ A variety of debilitating diseases affect Asian, African and American population significantly more than humans of other parts of the world and one of the common worldwide problem among them is the occurrence of intestinal parasites.²

Few of the major factors which determines the level of food contamination is the hygiene practice and oral health status of food handlers. Improper rules and pathways are followed while recruiting these food handlers before assessing their hygiene and health status in most of the developing countries. Many of these food handlers are a rich source of various pathogenic micro-organisms and infectious diseases which go undetected because of leniency in the recruitment system of these countries.

There has been a drastic increase in the prevalence various food borne diseases in developing countries due to rapid urbanizations and increased prevalence of various food practices.³

Due to high risk associated with the nature of some of the community jobs performed by workers of lower socio-economic status, there is high risk associated with the spread of these intestinal parasitic infections. Being a constituent part of some of the food related jobs, close contact with the individuals involved in such jobs imposes a high risk factor for the transmission of parasitic infectious micro-organisms to healthy individuals. Quality assessment of the food sold at various commercial centres is always a topic of major concern for developing countries.⁴ Food handlers are a potential source of transmitting infections as most of the infectious pathogens transmit through food and water contamination.⁵ Hence, we conducted the present study to assess the incidence of intestinal parasites among food handlers.

MATERIALS & METHODS

The present study was conducted in the Department of Community Medicine, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh (India) and included assessment of the various food handlers working in the kitchens of the various food services centres. Ethical approval was taken from the institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Assessment of a total of 180 food handlers was done in the present study. The present study was conducted for assessing the prevalence of intestinal parasites among various food handlers. A questionnaire was framed by skilled and experienced health care professionals for the collection of the personal details and demographic data of the subjects included in the present study. From the study

participants, records regarding the shoe wearing practice and finger nail trimming were collected and analysed. Stool specimens were collected from all the food handlers and were sent to laboratory in an air tight container for assessment. Assessment of the parasitological profile of the specimen was done following the criteria's described in the literature. Trophozoites of *E. histolytica* and *G. lamblia* were assessed and their presence and absence was recorded.⁶

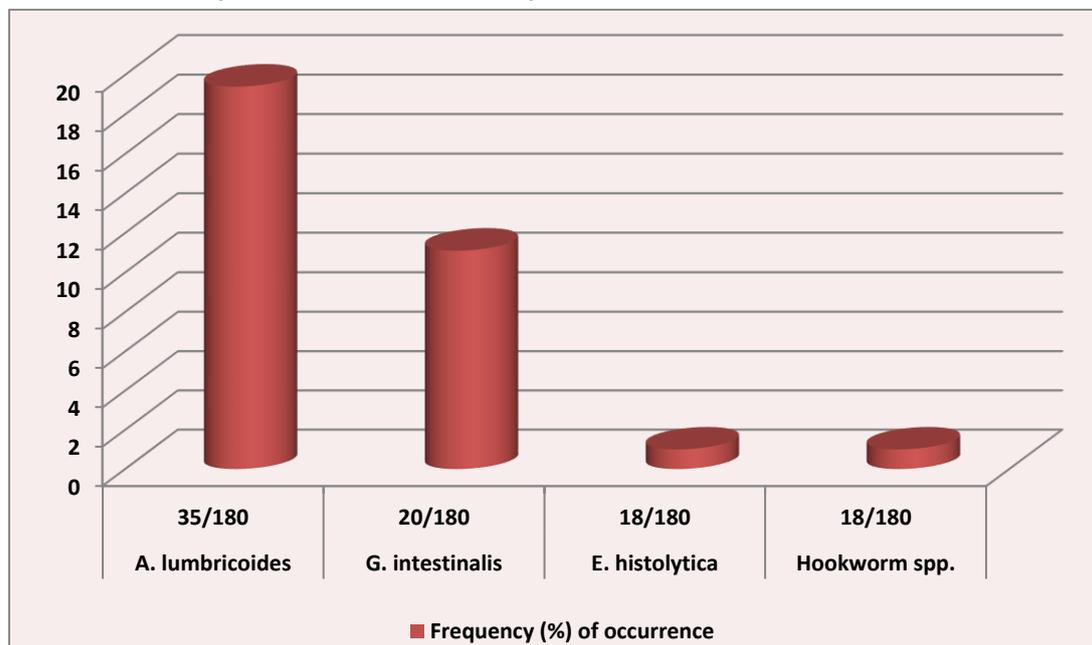
Statistical analysis

All the results were analysed by SPSS software. Chi-square test and multivariate regression curve were used for the assessment of level of significance. P-value of less than 0.05 was considered as significant.

Table 1: Prevalence of intestinal parasites identified from food handlers

Species of parasites	Infected population	Frequency (%) of occurrence
A. lumbricoides	35/180	19.4
G. intestinalis	20/180	11.1
E. histolytica	18/180	1.0
Hookworm spp.	18/180	1.0

Graph 1: Prevalence of intestinal parasites identified from food handlers



RESULTS

Table 1 and Graph 1 show the prevalence of intestinal parasites identified from food handlers. *Ascaris lumbricoides* (*A. lumbricoides*) were found in 19.4 percent of the population. *G. intestinalis* was observed in 11.1 of the study population. Both *E. Histolytica* and *Hookworm spp.* were observed among 1 percent each of the study population. Table 2 and Graph 2 shows the frequency of occurrence of intestinal parasitic infection among food handlers in relation to various demographic details. Significant results were obtained while comparing the percentage of positive subjects divided on the basis of age. Non-significant

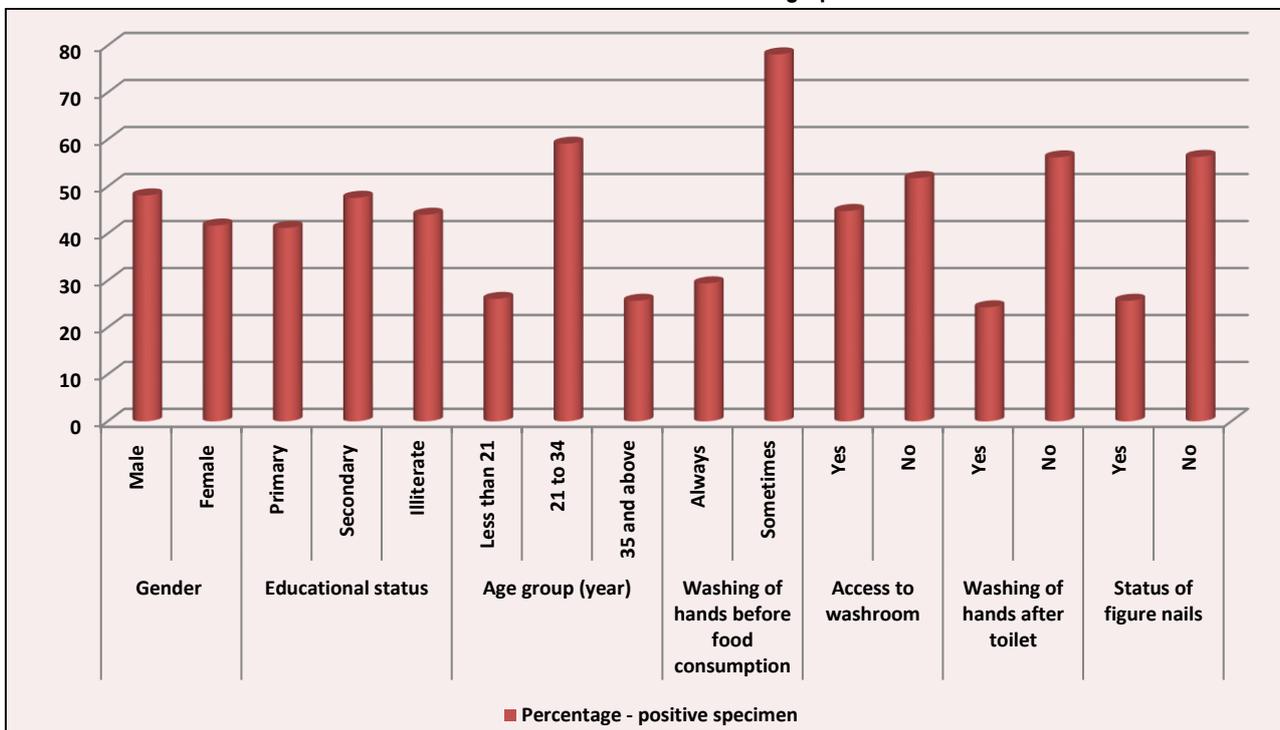
results were obtained while comparing the percentage of positive specimens divided on the basis of access to washroom. While comparing the positive patients divided on the basis of status of figure nails and washing of hands after toilet, significant results were obtained. 48.1 percent of the positive specimens were males. As far as educational qualification of the infection positive food handlers in concerned, 44 percent were illiterate, while 41.2 percent of them were educated up to the level of primary education. While talking in terms of age groups, majority of the food handlers who were positive for the presence of infectious parasites, majority belonged to the age group of 21 to 34 years.

Table 2: Frequency of occurrence of intestinal parasitic infection among food handlers in relation to various demographic details

Parameter		Positive specimen %	p-value
Gender	Male	48.1	0.87
	Female	41.7	
Educational status	Primary	41.2	0.97
	Secondary	47.6	
	Illiterate	44	
Age group (year)	Less than 21	26.1	0.02*
	21 to 34	59.1	
	35 and above	25.7	
Washing of hands before food consumption	Always	29.4	0.01*
	Sometimes	78.1	
Access to washroom	Yes	44.8	0.71
	No	51.8	
Washing of hands after toilet	Yes	24.3	0.03*
	No	56.2	
Status of figure nails	Yes	25.7	0.03*
	No	56.3	

*Significant

Graph 2: Frequency of occurrence of intestinal parasitic infection among food handlers in relation to various demographic details



DISCUSSION

In the world, intestinal parasites are estimated to affect many more than one billion of individuals. Most of these parasites are transmitted through contaminated water, food and environment. Oro-faecal route comprises of the most common route of transmission of these parasites.^{7,8} Giardia lamblia, Entamoeba histolytica and Ascaris lumbricoides forms one of the most common intestinal parasites affecting people all over the world.^{9,10} Food handlers form one of the common group of professionals which spread these parasites through oral route.^{11- 13} Hence, we conducted the present study to assess the incidence of intestinal parasites among food handlers.

In the present study, we observed that intestinal parasites occurred in approximately 45 percent of the study population. Our results were in correlation with study conducted by Abera B et al.⁹ A. lumbricoides was the predominant intestinal parasite observed in the present study. Andargie G et al reported similar findings.¹⁴ Daryani A et al conducted the cross-sectional study to assess the incidence of intestinal parasitic infections among schoolchildren in northern Iran by studying stool samples and reported slightly higher prevalence of intestinal parasite infections among females than in males, though without a statistically significant difference. However, a significant association was observed with parents'

educational level, household income and practice of hand washing before meals.¹⁵

Zain MM et al evaluated the socio-demographic characteristics, knowledge, attitude and practice towards food-borne diseases and food safety among of food handlers and revealed that none among them had any license and a significant number of food handlers (57.2%) had no certificate in food handlers training program. The educational level was found as no formal education (10.5%), primary school (31.9%), secondary school (57.0%) and diploma/degree holders (0.7%) and 61.9% had undergone routine medical examinations (RME).¹⁶

Abu-Madi MA et al surveyed intestinal parasitic infections among recently arrived immigrant workers in Qatar destined for employment in food handling occupations and seven species were detected among them, 3 nematodes and 4 protozoans (*Entamoeba histolytica/dispar*, non-pathogenic *Entamoebae*, *Blastocystis hominis* and *Giardia lamblia*). Overall prevalence of infections, all species combined was 33.9% (13.6% for nematodes and 24.8% for protozoa). The highest overall prevalence of *T. trichiura* was 26.3% among females from the Philippines. None of the Indonesian workers were infected with *A. lumbricoides* whereas those from the Indian sub-continent and the Philippines were more likely to carry hookworms.¹⁷ Takizawa MD et al reported the occurrence of enteroparasites among food handlers in the city of Cascavel, Brazil and reported positive fecal samples for 131 (38.2%) handlers. *Endolimax nana* (67.9%) was the predominant species, followed by *Entamoeba coli* (35.9%), *Blastocystis hominis* (28.2%), *Entamoeba histolytica/dispar* (10.1%) and *Giardia duodenalis* (8.4%). Protozoan infections were more common than helminth infections and positive results for some parasites were associated with the male sex, professional category, and the performance of other activities. The high overall occurrence of enteroparasites indicates improper hygiene and sanitation conditions. Effective educational measures should be implemented to prevent the transfer of pathogenic organisms to food via handling.¹⁸

CONCLUSION

From the above results, the authors concluded that frequency of occurrence of intestinal parasites among food handlers is very high. They comprise a very important source of infectious diseases affecting humans. Proper measures should be taken by the community health care centres in improving the hygienic conditions of food handlers for decreasing the prevalence of these infectious organisms.

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