



Distribution of intestinal parasites in Mukta Kamaiya people of far western region of Nepal

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ABSTRACT

Intestinal parasitic infections caused by intestinal helminths and protozoan parasites, are one of the most prevalent infections in humans residing in developing countries. These infections are distributed throughout the World, with high prevalence in low socio-economic communities in the tropic and subtropics. Hence a cross sectional study was conducted from total 103 Mukta kamaiya people from Mukta kamaiya sibir, Shiv-nagar, Dhangadhi from 10th November 2014 to 20th January 2015. Questionnaire was administered to retrieve information on age, sex, history of antiparasitic and toilet facilities. All the fecal samples were examined for the presence of parasites both macroscopically and microscopically. Microscopic examination was done by wet mount (Saline mount and Iodine preparation) method, by concentration method employing formal-ether sedimentation technique and diarrheal samples were also subjected to sucrose flotation method. Almost one in every five (n=20(19%)) laborers were found to be infected with intestinal parasites and shows the public health problem. The round worm infection was found among three-fifth (60%) followed by *H. Nana* (20%), Giardiasis (15%) and Trichuriasis (1%). *Ascariasis* was found to be seen in fertilized and non-fertilized ova whereas giardiasis in cyst and trophozoite forms, larva of *S. Stercularis* and ova of *H. Nana* were seen. There was significant difference observed among the types of parasite infection (p-value=0.003). Results of this study indicate lower prevalence of intestinal parasite compared to other parts of Nepal. However, less prevalence compared to that in previous studies may be due to continued public health education, health awareness programs.

INTRODUCTION

Intestinal parasitic infections are among the most common infections world-wide. It is estimated that some 3.5 billion people are affected, and 450 million are ill as a result of these infections [1]. Intestinal parasitic infections, as in many developing countries, are common and cause serious public health problems such as malnutrition, anemia and growth retardation as well as higher susceptibility to other infections [2].

Intestinal protozoan and helminthes parasites are widely prevalent and causing considerable medical and public health problems in developing countries [3]. Most of the people are

illiterate belonging to low socio-economic class and lack of awareness about importance of sanitation, personal and environmental hygiene with respect to health [4]. The intestinal parasitic infections are acquired by ingestion, inhalation or penetration of skin by infective forms and their high incidence is closely correlated to poverty and poor environmental hygiene [4]. These infections are most common in school age children and lead to nutritional deficiency, anemia, and growth retardation and impaired learning ability [5]. The World Health Organization (WHO) estimates that approximately 50 million people worldwide endure insidious amoebic infection each year, resulting in 40100 thousand deaths yearly [6, 7]. Current

estimates suggested that *Ascaris lumbricoides* can infect over a billion, *T. trichiura* can infect 795 million, and hookworms can infect 740 million people [8]. Similarly, intestinal parasitic infections are endemic in many developing countries of Asia and Africa due to poor sanitation, poor hygiene, and unavailability of safe drinking water [9].

Previous studies in Nepal have reported prevalence rate of intestinal parasitosis from low to nearly hundred percent. In Nepal, giardiasis, ascariasis, amoebiasis, ancylostomiasis and taeniasis are common intestinal parasitic infection. Intestinal protozoan infection and helminthic infection rank the third and the fourth respectively in Nepal [10]. Kamaiya system is a bonded agricultural labor system in which workers enter into the system with verbal agreement with the landowner and is a traditional practice in Tharu. After being freed on 17 July 2000, the bonded laborers (Kamaiya) were termed as 'freed bonded-laborer' (Mukta Kamaiya). They are socially excluded and economically deprived segment of the society having poor health status.

This study was designed to investigate epidemiologic features of intestinal parasites in an area with relatively high underprivileged population compared with the rest of the nation. The authors intend to use the findings of this study as a foundation to support public health decision-making in the area of prevention and control strategies for intestinal parasitic infections [11].

MATERIALS AND METHODS

This study was designed to determine the patterns of intestinal parasitic infections in 'freed bonded-laborer' (Mukta Kamaiya). Hence a cross sectional study was conducted from total 103 mukta kamaiya people from mukta kamaiya sibir, Shiv-nagar, Dhangadhi from 10th November 2014 to 20th January 2015. Questionnaire was administered to retrieve information on age, sex, history of antiparasitic and toilet facilities. All age group were included for this study, the person who were on the medication of antiparasitic drugs were excluded from the study. They were provided with stool container one day prior and were informed about the significance of the study to provide stool samples for the detection of ova, larvae, flagellates and cyst of parasites, regardless of the presence of diarrhea. Only a single morning stool sample was collected. All the fecal samples were examined for the presence of parasites both macroscopically and microscopically. Microscopic examination was done by wet mount (Saline mount and Iodine preparation) method, by concentration method employing formal-ether sedimentation

technique and diarrheal samples were also subjected to sucrose flotation method. The significance in difference of quantitative data was analyzed by Chi-square test. A 95% confidence interval and less than 5% level of significance was used to check for association between independent and dependent variables by SPSS v 17.0 software

RESULTS

Infection Status and Types of Parasites

Almost one in every five (n=20(19%)) laborers were found to be infected with intestinal parasites and shows the public health problem in freed bonded labor camp of Dhangadhi (Fig. 1). Different four types of parasites were found infecting in the camp. The round worm infection was found among three-fifth (60%) followed by *H. Nana* (20%), *G. lamblia* (15%) and *Trichuriasis trichurria* (1%). *Ascaris lumbricoides* was found to be seen in fertilized and non-fertilised ova whereas *G. lamblia* in cyst and trophozoite forms, larva of *S. Stercularis* and ova of *H. Nana* were seen. There was significant difference observed among the types of parasite infection (p-value=0.003). *Ascaris lumbricoides* was found more as compared to other infection (Fig. 2).

Associative Characteristics of Infection

Although female were seen to be infected more than male (55% Vs. 45%), it was not statistically significant (p-value=0.30). Similarly, half (50%) of the infected sample was 15 years and above, followed by 6 to 14 years (35%) and remaining were found to be less than or equal to five years (Tab. 1). Although variation was observed between the infected and non-infected, the statistical difference was not significant (p-value=0.29).

DISCUSSION

Our study aimed at finding the distribution of intestinal parasites infection and to evaluate the risk factors associated in mukta kamaiya people. The overall prevalence of intestinal parasites was 19% in the Mukta Kamaiya people. The result is almost similar to the that reported in Afar, Ethiopia [12], Cameroon [13], and Saudi Arabia [14], but lower than those from Jimma [15]. In this study, *Entamoeba histolytica/E. dispar* and *Giardia lamblia* were the commonest nonopportunistic protozoa. The round worm infection was found among three-fifth (60%) followed by *H. Nana* (20%), *Giardiasis* (15%) and *Trichuriasis* (1%). It is lower than the one in Kenya (58.3%) [16] and similar with Ethiopia (23.8%) [15]. The overall prevalence of *Giardia*

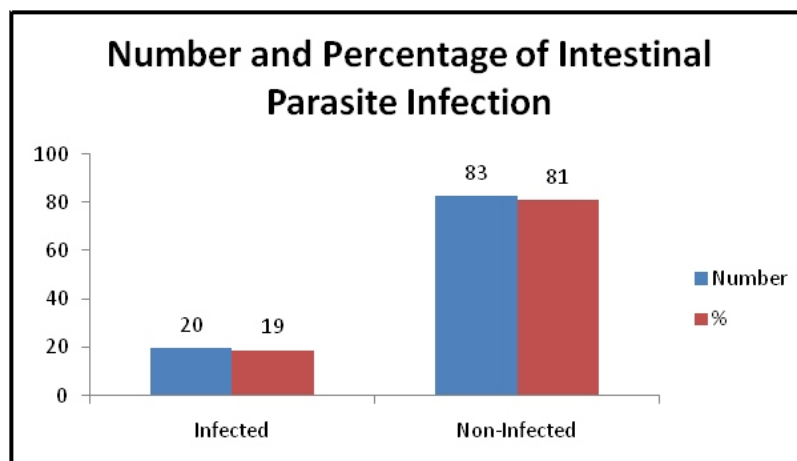


Fig 1. : Status of Intestinal Parasite Infection among the free bonded laborers

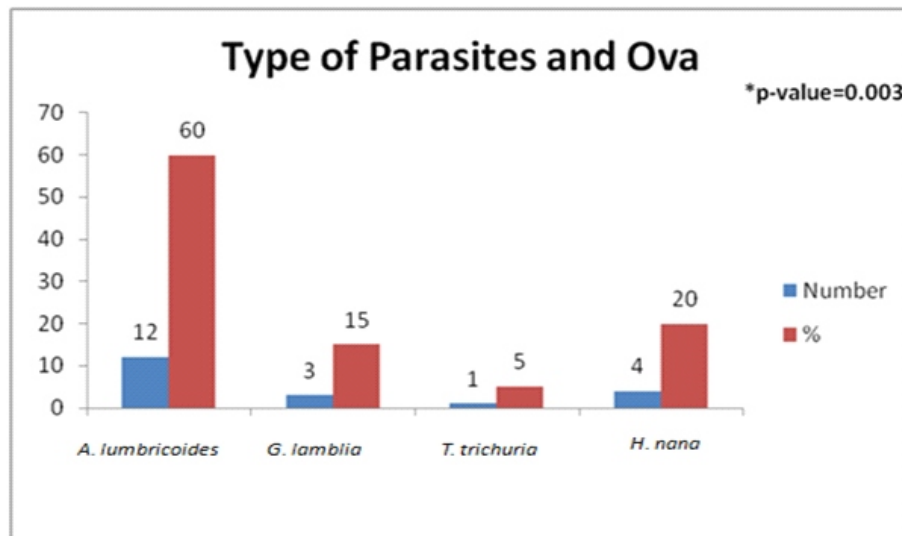


Fig 2. : Types of parasite infection and percentage (*p-value for chi-squared statistics at 3 df)

Table 1. : Association of age and sex of with infection status

Variable	Status of Parasite Infection		χ^2 -statistic(df)	p-value
	Infected, n=20(%)	Non-infected, n=83(%)		
Sex				
Male	9 (45)	42 (52)	0.58 (1)	0.30
Female	11 (55)	39 (48)		
Age (Yrs.)				
=5	3(15)	8(9)	2.47 (2)	0.29
6-14	7(35)	18(22)		
15+	10(50)	57(69)		

lamblia was 15 %, slightly higher than 10.6% in Ethiopia [15], 1.9% in Jakarta [16] and similar with 16.6% in Kenya [16]. Although female were seen to be infected more than male (55% Vs. 45%), it was not statistically significant (p-value=0.30). Similarly, half (50%) of the infected sample was 15 years and above, followed by 6 to 14 years (35%) and remaining were found to be less than or equal to five years. In the present study of Mukta kamaiya sibir survey, about 95% of the respondents replied that they used water for domestic purpose including drinking directly without further processing (filtering, boiling) implying it to be the major route of transmission. Studies revealed that water supply is an important risk factor for amoebiasis and giardiasis, and several large outbreaks have resulted from the contamination of municipal water supplies with human waste [17]. In summary, findings of this study emphasize that intestinal parasitic infections is a major public health challenge that needs to be addressed in order to decrease its burden on the health care system as well as the society as whole. The authors believe that public education, health promotion, improving sanitation conditions of

underdeveloped areas/communities, community involvement (especially underprivileged), and supporting evidence-based practice/programs are the keys to success in preventing the spread of intestinal parasitic infections in Nepal. In this regard, findings of this study can be used as a basis to develop strategies and preventive programs targeting groups at greater risk of intestinal parasitic infections [18].

CONCLUSIONS

Results of this study indicate lower prevalence of intestinal parasite compared to other parts of Nepal. However, less prevalence compared to that in previous studies may be due to continued public health education, health awareness programs. However, a higher prevalence compared to that in developed countries and being lower community labor workers indicates high soil and water contamination with intestinal worms, which proves the need of periodic administration of anti-parasitic drugs and improvement of sanitary/hygienic practice to completely reduce the prevalence.

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