

Original Article

Identification of Hookworm Species in Stool By Harada Mori Culture

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Abstract

This cross sectional study was done from January 2009 to June 2010 in Microbiology department of Dhaka Medical College, Dhaka to identify hookworm species and to compare different laboratory methods for diagnosis of hookworm infections. Among the 375 stool samples evaluated, 26 (6.93%) samples were positive for hookworms. *Ankylostoma duodenale* were 3 (11.50%) and *Necator americanus* were 23 (88.50%). Harada Mori culture was found as the most effective method for detection of hookworms.

Key words: Hookworm; Harada Mori culture.

Introduction

Intestinal parasitic infections are globally endemic and have been described as constituting the greatest single worldwide cause of illness and disease.¹ The World Health Organization (WHO) estimates that 3.5 billion people worldwide are infested with some type of intestinal parasite, and as many as 450 million of them are sick as a result.² *Ascaris lumbricoides*, *Trichuris trichiura* and hookworms, collectively referred to as soil-transmitted helminths (STHs), are the most common intestinal nematodes.³ Direct stool smear technique is quick to prepare and inexpensive when compared with other methods but it can miss eggs of hookworms if concentration is too low or if too much debris or fat is present.⁴ There is need for increase probability of finding the parasite in the fecal samples to allow for accurate diagnosis, hence there is need to practice other methods.⁵ It has been proved that Harada Mori culture technique offers many advantages over direct stool smear technique for detecting hookworms. If performed correctly, this methods is sensitive, simple, economical and ease to carry out.^{5,6,7}

Material and Methods

This cross sectional study included 375 person of all age group of the patients attending at outpatient department of

Dhaka Medical College, people of two villages Konakhola and Malancha in Keraniganj Upazilla, Dhaka, children from an orphanage in Dhaka city and among people of two urban slum Korail and Kamrangirchar in Dhaka city. The sample was selected by simple random sampling. After labeling, a plastic container was supplied to each person to collect the stool in the next morning. The container of stool samples was collected during visit in the next morning and was transported to the microbiology laboratory as early as possible. The collected stool was immediately examined macroscopically and microscopically and was cultured by Harada Mori culture technique.⁷ The results of the study were recorded systematically. Data analysis was done manually.

Result

A total of 375 stool samples from healthy people of different age and sex were included in this study. Most (45.06%) were in the age group of 10 years. Highest prevalence (61.53%) of hookworm infections were in the age group of 10 years (Table I).

Table I: Distribution of parasite infections in different age groups.

Age in years	Number examined	Number infected
□ 5	78	6
□ 6-10	91	10
□ 11-20	58	5
□ 21-30	42	2
□ 31-40	47	1
□ 41-50	34	1
□ > 50	25	1
□ Total	375	26

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Among the 26 Harada Mori culture positive stool samples, only 3 (11.53%) were detected as *A. duodenale* and 23 (88.47%) were detected as *N. americanus*.

Different methods of stool examination are compared in Table-II.

Table II: Detection of hookworms by different procedures.

Routine microscopy		Kato	Formal petrol	Harada
Saline	Iodine	-Katz method	method	Mori culture
15	12	04	05	26

Discussion

In this study, among the 375 samples, 26 (10.15%) were infected by hookworm. Among the 26 infections, 17 (65.39%) were found in two villages of Keraniganj Upazilla and 9 (34.61%) were found in two slums of Dhaka city. Hookworm was more prevalent in rural areas. This is due to people of these two villages mostly walk barefooted. In contrast, the prevalence was much lower in the study population in and around Dhaka city where most of the people live in urban setting and most of them use foot wear. A study in Dhaka by Muscat *et al.* (2004) had shown that the prevalence of hookworm was 10% which is similar to the present study. Similar low prevalence (07.9%) was also observed by Huq and Yasmin (1985) in Dhaka city. In contrast, study on intestinal parasite among tea gardeners in Sylhet by Ali *et al.* (1985) showed the prevalence of hookworm was 28.4% which is higher than present study and this higher prevalence might be due to most of the most people in tea garden walk barefooted and the moist soil of tea garden facilitates the survival and maturation of hookworm larvae. This study showed that *N. americanus* was the dominant hookworm species (88.47%) in the study population. Huq and Yasmin (1985) found the prevalence of *N. americanus* was 68% among the hookworm infection.

Among 26 Harada Mori culture positive cases of stool samples, 15(57.69%) were positive in routine microscopic examination. This reflects that hookworm eggs might be missed during wet film microscopy but can be detected by Harada Mori culture method. This might be due to the fragile nature of hookworm eggs which tend to disappear shortly after preparation. But when the sample was placed directly in Harada Mori culture tube there was the growth of hookworm larvae which indicates the patient was infected with hookworm. Similar study by Okolie (2007) in Nigeria showed that Harada Mori culture was more effective to detect hookworm than routine wet film microscopy.

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