



A DETAILED STUDY OF THE ROLE OF WHIPWORM INFECTION IN CAUSING EOSINOPHILIA

Govindarajalu Ganesan

Associate Professor, Dept. of General surgery, Indira Gandhi Medical College and Research Institute, Puducherry 605009, India.

Corresponding Author:- **Govindarajalu Ganesan**
E-mail: drgganesan@gmail.com

<p>Article Info Received 15/08/2016 Revised 27/08/2016 Accepted 2/09/2016</p> <p>Key words: adult whipworm, <i>Trichuris trichiura</i>, eosinophilia in whipworm infection, colonoscopy.</p>	<p>ABSTRACT Objective: To study the role of whipworm infection in causing eosinophilia. Methods: A study of 72 patients who had undergone colonoscopy for a period of 5 years from November 2009 to October 2014 was carried out in order to find out the presence of parasitic worms during colonoscopy in these patients. In patients found to have parasitic worms during colonoscopy, investigations were done to know about the presence of eosinophilia. Results: Out of these 72 patients, parasitic worm was found in the colon in only one patient. The parasitic worm found in this patient was identified as whipworm or <i>Trichuris trichiura</i> by its characteristic whip like shape. It has a short posterior thick part resembling the short handle of the whip and a long, thin anterior part resembling the distal long, thin part of the whip. In our patient with whipworm infection eosinophilia was not present (eosinophils 4%, white blood cell count 10,900/cu.mm). Conclusion: Our patient was found to have whipworm in the colon while doing colonoscopy. But eosinophilia was not present in our patient.</p>
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INTRODUCTION

Whipworms are the most common nematodes or roundworms found in the large intestine of human beings while doing colonoscopy. Our patient was also found to have whipworm in the colon while doing colonoscopy. A detailed study of the role of whipworm infection in causing eosinophilia was carried out.

MATERIALS AND METHODS

This study was conducted in the department of general surgery, Aarupadai Veedu Medical College and Hospital, Puducherry. A study of 72 patients who had undergone colonoscopy for a period of 5 years from November 2009 to October 2014 was carried out in order to find out the presence of parasitic worms during colonoscopy in these patients.

In each of these patients, presence of any parasitic worm was carefully looked for during the procedure of colonoscopy and the colonoscopic pictures of each patient were carefully studied and analysed. In patients found to have parasitic worms during colonoscopy, investigations

were done to know about the presence of eosinophilia. Eosinophilia is defined as eosinophils > or = 500 cells/cu.mm.

RESULTS

Out of these 72 patients, parasitic worm was found in only one patient. The parasitic worm found in this patient was identified as whipworm or *Trichuris trichiura* by its characteristic whip like shape. This patient was an eighty year old male patient and one adult whipworm was found in the sigmoid colon of this patient while doing colonoscopy. His white blood cell count was 10,900/cu.mm and his differential white blood cell count was polymorphs 80%, lymphocytes 16% and eosinophils 4%. The patient was treated with a single dose of 400mg of albendazole

Absence of eosinophilia in whipworm infection

In our patient, eosinophilia was not present (eosinophils 4%, white blood cell count 10,900/cu.mm, eosinophils 4% of 10,90 = 436 cells/cu.mm). Eosinophilia is defined as eosinophils > or = 500 cells/cu.mm.



Figure 1. showing clearly and entirely only the short, posterior thick part of the whitish coloured whipworm and only a very small portion of the long, thin anterior part since the anterior part penetrates into the large intestinal wall for feeding purpose.

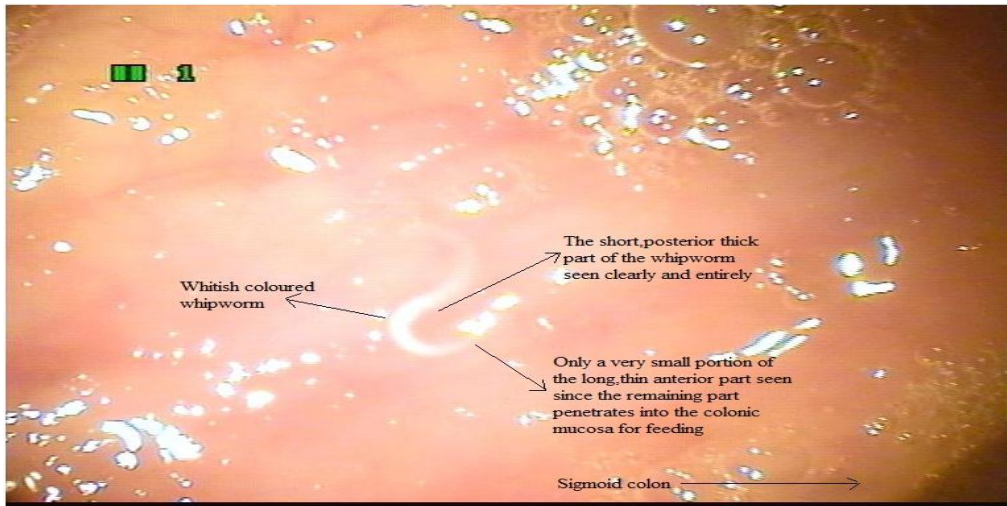
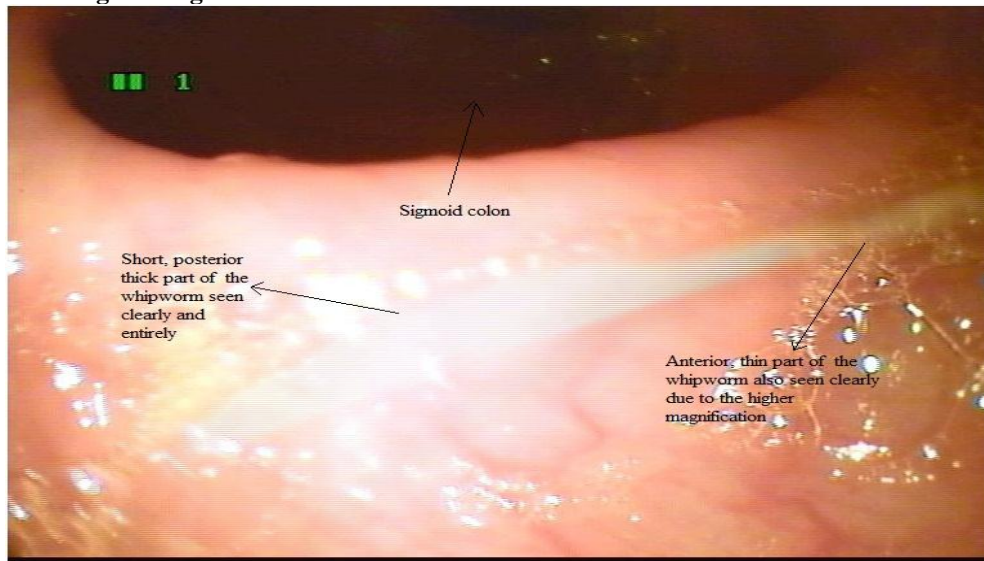


Figure 2. Magnified view showing clearly both the short, posterior thick part and also the anterior, thin part of the whipworm due to the higher magnification.



DISCUSSION

1. Parasitic worms occurring in the large intestine of human beings

Whipworms are the most common nematodes or roundworms found in the large intestine of human beings while doing colonoscopy. Our study has also shown the presence of whipworm in the large intestine or colon of a patient while doing colonoscopy. Only rarely intestinal helminths other than whipworm or *Trichuris trichiura* were found in the large intestine of human beings while doing colonoscopy.

2. Size of whipworm and its life cycle

The male whipworm is 3 to 4.5 cm and the female whipworm is 3.5 to 5 cm in length. Adults can live for years and deposit thousands of eggs per day. Infective eggs are

ingested from eating contaminated soil. Upon ingestion the eggs hatch into larvae in the small intestine. The larvae eventually migrate to the large intestine and complete maturation to adult worms in 1 to 3 months.

3. Eosinophilia in whipworm infection

Our patient with whipworm infection did not have eosinophilia. Eosinophilia was also not found in whipworm infection in various other studies. In a study conducted by Kyung-Sun Ok et al in Korea, colonoscopy revealed a small, white, worm-like object attached to the cecum (*Trichuris trichiura*) in a 56-year-old male patient without eosinophilia (absolute eosinophils, $297/\text{mm}^3$) [1]. In the same study by Kyung-Sun Ok et al in Korea, colonoscopy revealed a small, white, worm on the



proximal ascending colon (*Trichuris trichiura*) in a 46 year old male patient without eosinophilia (absolute eosinophils, 84 /mm³). In the same study by Kyung-Sun Ok *et al* in Korea, colonoscopy revealed a small, white, worm within the ileocecal valve (*Trichuris trichiura*) with absolute eosinophils, 480 /mm³ in a 55 year old male patient. In the study conducted by N Tokmak *et al* in Turkey, a 75 year old male patient without eosinophilia had whipworm or *Trichuris trichiura* infection in ascending colon [2]. In the study conducted by J Bahon *et al* in France, a 84 year old female patient without eosinophilia had whipworm or *Trichuris trichiura* infection in cecum and ascending colon [3].

4. Eosinophilia in other parasitic infections

Eosinophilia is not common in whipworm infection, but is common in other parasitic infections like hookworm infection. In the study conducted by CH Wang *et al* in Taiwan, sigmoidoscopy revealed hookworm infection (by *Ancylostoma*) in the colon in a 54 year old male patient with severe eosinophilia [4].

5. Whitish colour of whipworm

Whipworms do not feed on blood and feeds only on the tissue secretions of the large intestinal wall. Whipworm is always whitish in colour as it does not feed on blood (fig 1, 2).

6. Only a very small portion of the long anterior part of whipworm seen during colonoscopy

We can see only the short posterior thick part of whipworm entirely in the lumen of the large intestine but only a very small portion of the long, thin anterior part while doing colonoscopy since most of the anterior part penetrates into the large intestinal wall in order to feed on

the tissue secretions of the large intestinal wall. Hence in fig 1, we can see only the short posterior thick part of the whitish coloured whipworm entirely in the lumen of the sigmoid colon but only a very small portion of the long, thin anterior part since most of the anterior part penetrates into the large intestinal wall for feeding purpose. But in the highly magnified view in fig 2, we can see clearly both the short posterior thick part and also the anterior thin part clearly due to the higher magnification.

CONCLUSION

1. Whipworms are the most common nematodes or roundworms found in the large intestine of human beings while doing colonoscopy.
2. In our patient with whipworm infection, eosinophilia was not present.
3. Eosinophilia was also not found in whipworm infection in various other studies.
4. Hence eosinophilia is not common in whipworm infection.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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