

# Anemia in Parasitic Infections in Patients Attending a Tertiary Care Hospital.

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## ABSTRACT

**Background:** This study showed the importance of intestinal parasitic infections in developing countries, the present study was undertaken to determine the prevalence of intestinal parasitic infections in general population attending the hospital. **Methods:** A total of 194 individuals of different age groups were included. The study was conducted in the department of Pathology & Microbiology at G.C.R.G. Institute of Medical Sciences, Lucknow. The duration of study was over a period of one year. **Results:** In our study, 194 total numbers of cases were included and 117 cases had parasitic infections. **Conclusion:** The study showed that, most of the affected individuals are generally poor, thus malnutrition may be secondary to poverty, and both in turn play a significant role in the prevalence of parasites causing infection and anemia.

**Keywords:** Anemia, Parasitic Infections, Parasites

## INTRODUCTION

Worldwide, intestinal parasitic infection is endemic. It has been reported that it has high prevalence rate in many regions of developing countries. Around 3.5 billion people are affected by this infection and majority being children. Apart from morbidity and mortality, these infections causes iron deficiency anemia, and growth retardation in children.<sup>[1]</sup> Helminthic infection is also associated with protein energy malnutrition, low pregnancy weight and intra uterine weight gain. *Ascaris lumbricoides* (20%), hookworm (18%), *Trichuris trichiura* (10%) and *Entamoeba histolytica* (10%) are the most common parasite causing infections.<sup>[2]</sup> Mostly these infections are communicated through soil.<sup>[3]</sup> Poor sanitation, scarcity of potable drinking water and substandard personal hygiene practices are the main reasons of such infections.<sup>[4]</sup> Low socioeconomic status, urbanization and industrialization with unplanned reforestation and the climatic changes may be the other reasons for these infections.<sup>[5]</sup> The prevalence of these infections in India ranges from 12.5% to 66%.<sup>[6-8]</sup> WHO (1987) reported that healthy environmental sanitation and a high standard of living have resulted in a reduction of intestinal parasites in developed countries.

The foregone study showed the significant importance of intestinal parasitic infections in developing countries, the present study was undertaken to determine the prevalence of intestinal parasitic infections in general population attending outdoor departments of our institute.

## MATERIALS AND METHODS

**Study Population:** A total of 194 cases were included in this study.

**Study Area:** This study was conducted in the Department of Pathology & Microbiology at G.C.R.G. Institute of medical sciences, Lucknow.

**Study Duration:** The duration of study was over a period of one year.

**Sample Collection:** Stool samples were collected in wide mouthed sterile screw capped labeled containers without preservative. The sample received were subjected to complete examination both gross and microscopy. In gross examination consistency of the stool sample, presence of mucus, blood, intestinal worm and segments of the tapeworm was noted. Microscopic examination included saline and iodine wet mount, which was observed under 10× and 40× magnifications. Hemoglobin was estimated by cyanmethemoglobin method which is the standard method of hemoglobin estimation as recommended by world Health Organisation (WHO).

**Data Analysis:** Data were analyzed by using Microsoft excel

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## RESULTS

**Table 1: Distribution of cases according to gender**

Gender	No Of Cases	Percentage	Infected Cases	Percentage
Male	125	65.5%	76	64.9%
Female	69	35.5%	41	35.1%
Total	194	100%	117	100%

**Table 2: Distribution of cases according to age**

Age Group	No Of Cases	Percentage
1-10	41	35.1%
11-20	45	38.4%
21-30	13	11.2%
31-40	12	10.2%
41-55	6	5.1%
Total	117	100%

In our study, 194 total numbers of cases were included, out of 65.5% male & 35.5% were female. Among all cases, 117 cases were getting parasitic infection. Out of 117 cases 64.9% were male and rest was female. In this study, we were included 1-55 age group cases. Out of all cases we found that most

of the cases were belongs to 11-20 (38.4%) age group followed by rest age groups. We observed that, 36.7% cases get infected with *Entamoeba histolytica* (36.7%) followed by *Ascaris lumbricoides* (32.4%), *Ancylostoma deudenale* (25.6%), *Giardia lamblia* (2.5%), *Enterobius vermicularis* (1.7%), *Trichuris trichura*. (0.8%). We suggested that, 41.8% anemic cases with infected by different parasites out of all cases which showed in [Table 4].

**Table 3: Distribution of cases according to parasites**

Parasites	No. Of Infected Cases	Percentage
<i>Entamoeba histolytica</i>	43	36.7%
<i>Giardia lamblia</i>	3	2.5%
<i>Enterobius vermicularis</i>	2	1.7%
<i>Ancylostoma deudenale</i>	30	25.6%
<i>Ascaris lumbricoides</i>	38	32.4%
<i>Trichuris trichura</i>	1	0.8%
Total	117	100%

**Table 4: Distribution of cases according to correlation with anemic cases**

Parasites	With Cases	Anemic	Percentage	Without Cases	Anemic	Percentage
<i>Entamoeba histolytica</i>	11		22.5%	32		47.1%
<i>Giardia lamblia</i>	1		2.1%	2		2.9%
<i>Enterobius vermicularis</i>	2		4.0%	0		0%
<i>Ancylostoma deudenale</i>	18		36.7%	12		17.7%
<i>Ascaris lumbricoides</i>	16		32.6%	22		32.3%
<i>Trichuris trichura</i>	1		2.1%	0		0%
Total	49 (41.8%)		100%	68(58.2%)		100%

## DISCUSSION

This study recovered six parasite species i.e. two protozoans and four nematodes in rural area. 60.3% people were affected by the parasitic infection. Among them 35.1% were females and 64.9% were males. It has been found in the present study that lack of hygiene and environmental contaminations of drinking water are the main reasons of infection. In a study by Al-Yassari (2004),<sup>[9]</sup> reported that same parasitic species were found in patients admitted to hospitals in Babylon province. In the present study, most abundant parasites were *E. histolytica* (47.1%). The abundance of *E. histolytica* is expected because of its simple life cycle as there is no intermediate host. The infection comes generally through polluted food and drinks. In such cases, the house flies also are very known for mechanical transmitter. Similar results were observed by Adedayo and Nasiro (2004).<sup>[10]</sup> The lowest infection by *T. trichura* (0.8%) is expected as the worm is one of the geohelminths that need some period in the soil to be developed to the infective stage (Muhangi et al., 2007).<sup>[11]</sup> Due to the use of chemical fertilizers instead of stool in farming may lead to reduction of infection. Anemia was more seen in patients infected with *E. histolytica*, *G. lamblia*, *A. duedenale*, *T.*

*trichura* and *A. lumbricoides*. The incidence of parasitic-induced anemia may likely due to the effect of parasitism, or low nutritional level. Such findings are similar to the results of Koukounari et al. (2008).<sup>[12]</sup> Al-Zubaydi (2002) conducted a study in Babylon revealed that 37% of anemic subjects were suffering from the hookworm (*A. duedenale*) infection.<sup>[13]</sup> Brenitlinger et al. (2003) study showed that the hemoglobin level in hookworm-infected women was significantly lower than uninfected ones.<sup>[14]</sup> Though anemia is evident in the present population but it is not clear whether it is due to the folate and vitamin B12 deficiencies and hemoglobinopathies like sickle-cell anemia and thalassemia. In this study, the main cause of anemia is more likely due to mild iron deficiency that does not display microcytosis or other nutritional deficiencies. Similar results were found by Adedayo and Nasiro (2004).

Anemia in females may be associated with their work as farmers leading to contact with infective stages of parasites in addition to the poor hygiene and sanitation. *E. histolytica*, *G. lamblia*, *A. lumbricoides*, and *T. trichura* infection were highly observed in the age group 1-10 and 11-20 years whereas *E. vermicularis* and *A. duedenale* in age group 41-55 and 21-30 years, respectively. Similar

results of children infection by *S. mansoni* and Koukounari et al. (2008) found in their studies.

This study showed that *A. duodenale* causes anemia compared to *G. lamblia*. It is well known that blood loss per worm is about 0.03 ml per day in *Necator americanus* and 0.26 ml per day in *A. duodenale* infections (Roberts and Janovy, 2005).<sup>[15]</sup> The nutritional status of individuals is an important criterion in the determination of anemia which was not estimated in the present investigation. It is expected that the older group is anemic as immunity usually decreased. However, the highest concentration of hemoglobin in the age 41-50 years seems to be contradicted. The findings of the present study need more confirmation by assessing the nutritional status of individual in the health center.

## CONCLUSION

This study showed that, people are generally poor, thus malnutrition may be secondary to poverty, and both in turn playing a significant role in the prevalence of parasitic infection and anemia, although parasitic infection tends to increase the prevalence, level, and severity of anemia.

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