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***Immunoparasitological diagnosis of  
Strongyloides stercoralis in garbage collectors  
in Uberlândia, MG, Brazil.***

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ABSTRACT

*The objective of this study was to determine the presence of **Strongyloides stercoralis** in urban garbage collectors through the use of immunological and parasitological methods. A total of 92 individuals were evaluated from August, 1997, to June, 1998. For the parasitological diagnosis Baermann and Lutz' methods were applied. The immunological diagnosis involved the indirect fluorescence antibody test (IFAT) and the enzyme-linked immunosorbent assay (ELISA) to detect specific IgG antibodies. Of the 92 workers examined, six (6.5%) were infected with larvae of **S. stercoralis**. The IFAT detected 19 (16.3%) and the ELISA 17 (18.5%) positive serum samples. The differences between the results of parasitological and immunological methods were statistically significant ( $p < 0.05$ ). These results demonstrate that there is a need to improve the health conditions of this category of city employees.*

**Key words:** *Strongyloides stercoralis, Garbage collectors, Intestinal parasites, Brazil.*

INTRODUCTION

Strongyloidiosis is caused by a geohelminth, *Strongyloides stercoralis* occurring worldwide and particularly in tropical regions<sup>1,2</sup>. Although the disease is manifested in most cases as chronic and asymptomatic, potentially fatal outcomes may occasionally occur, especially among individuals with immunosuppression<sup>3,4</sup>.

In spite of the elevated incidence of intestinal parasites, including *S. stercoralis*, in the city of Uberlândia, as well as the characterization of Uberlândia as a hyper-endemic region in terms of strongyloidiasis, there is an absence of studies on parasitosis among public employees. Thus, the objective of the present study was to

investigate the presence of *S. stercoralis* among garbage collectors in Uberlândia, MG, Brazil, using parasitological and immunological methods.

MATERIALS AND METHODS

Uberlândia is the center of a macro-region, the "Triângulo Mineiro", with 500.095 habitants. In 1997, the city had 410 employees working in the public sanitation system. The present study was conducted among 92 individuals, randomly selected between August, 1997, and June, 1998, with previous written authorization and completion of identification files. Fecal and blood samples were collected and processed in the parasitological laboratory of the Federal University

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of Uberlândia, MG.

For the parasitological diagnosis, fresh fecal samples were collected on consecutive days. These samples were examined using the Baermann<sup>5</sup> and Lutz<sup>6</sup> methods. For each method eight separate tests were conducted. The total number of 4,416 slides were thus examined. When the parasitological stool examination was positive the workers was informed and referred for medical treatment.

The immunological diagnosis to detect IgG anti *S. stercoralis* antibodies was realized in serum samples by the indirect fluorescent antibody test (IFAT)<sup>7</sup>, and the enzyme-linked immunosorbent assay (ELISA)<sup>8</sup>, using slides containing sections of filarid and alcalin larval extract of *S. venezuelensis*.

The results were expressed as antibody titers, considered positive when  $\geq 20$  by IFAT or  $\geq 80$  by ELISA. Reactive serum samples were retested in two fold serial dilutions up to the end-point titer. The results of the parasitological and immunological methods were analyzed using Fisher's test with  $p < 0.05$ .

## RESULTS AND DISCUSSION

The mean age of the participants in the study

was 49 years (28 - 70 years), 40 (43.5%) individuals were male and 52 (56.5%) female. Parasitological results revealed six (6.5%) cases of *S. stercoralis*, confirmed that the region of Uberlândia as endemic<sup>9-11</sup>.

Serological methods have been found to be helpful for the diagnosis of strongyloidiasis<sup>7,8,10,12</sup>. Of the 92 serum samples examined, 17 (18.5%) were positive for *S. stercoralis* by immunological methods, 15 (16.3 %) were positive by IFAT and 17 (18.5%) by ELISA. The parasitological and immunological results are demonstrated in Table 1. Although significant differences were found between the parasitological and immunological results using the two methods ( $p < 0.05$ ), all of the six individuals with positive parasitological results for *S. stercoralis* were also found to be positive by both immunological methods. Results demonstrated that 52.9% of the cases using reagents for the identification of *S. stercoralis* were females.

Related studies on the occurrence of intestinal parasites in workers exposed to sewage have demonstrated the occupational risk of intestinal infection<sup>13,14</sup>. Between July, 1997 and December, 1998 a study of infections by parasites was conducted among street people in Rio de Janeiro, Brazil. The results included *Ascaris lumbricoides*

**Table 1. Characterization of the positive cases of *Strongyloides stercoralis* in terms of age and sex using two parasitological and immunological methods to examine garbage collectors in Uberlândia, MG, Brazil**

Age (years)	Sex	Parasitological methods	IFAT	ELISA
67	M	<i>S. stercoralis</i>	80	80
46	F	<i>S. stercoralis</i>	160	640
48	M	<i>S. stercoralis</i>	20	160
36	F	<i>S. stercoralis</i>	40	320
47	M	<i>S. stercoralis</i>	20	160
59	M	<i>S. stercoralis</i> + hookworm	160	640
37	M	<i>Giardia lamblia</i>	20	320
52	F	Negative	20	160
54	M	Negative	20	320
40	F	Negative	20	320
53	M	Negative	Negative	640
49	M	Negative	Negative	320
40	F	Negative	40	160
54	F	Negative	40	320
36	F	Negative	20	320
58	M	Negative	20	320
34	F	Negative	40	160

F: female; M: male. IFAT: Indirect fluorescence antibody test, ELISA: enzyme-linked immunosorbent assay. The results were expressed as antibody titers.

in 48.85%, *Thichuris trichiura* in 32.9% and hookworm in 8.5% of the participants suggesting the potential contamination of public areas in the locale<sup>15</sup>. The contact with garbage may, thus, be associated with such risks as intestinal parasites, especially when the protective equipment is not used adequately. It is, thus, not surprising that public workers in this area had acquired strongyloidiasis and demonstrated positive results for *S. stercoralis* by the immunological tests applied. The results also suggest that the detection of specific antibodies of *S. stercoralis* by IFAT and ELISA tests may contribute to the diagnosis of strongyloidiasis, principally as complementary parasitological methods.

The present study of strongyloidiasis in garbage collectors is significant in terms of offering evidence of the health situation of workers as well as to suggest a method for screening them for participation in programs to control intestinal parasites.

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