The Value of Routine Screening for Intestinal Parasites

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Introduction

The usefulness of multiphasic screening of patients for both early diagnosis and progress of therapy has been recognized in the past two decades. Sackett points out that the basis for general acceptance of the periodic health examination is the reasonable assumption that early diagnosis will result in a more favorable disease course.[1] Although modern automation has facilitated screening for abnormal values in biochemistry,[2] the usefulness of random stool examination for early detection of parasites has not been established in nonendemic areas. Mantel and Yoeli stress the reasons why stool examinations are seldom performed in temperate climates, even on patients with gastrointestinal disorders.[3] When the clinicians do seek parasitological information on their patients, they will get little help from a laboratory that does not specialize in parasitology.

The routine methodology for stool examinations has not changed for decades. The work must be performed manually, and the results are only as reliable as the individual laboratory technician using the microscope. It is unfortunate that in most hospitals the parasitology laboratory has remained the "poor relative" of clinical pathology.

Increasing travel to endemic areas owing to expanding tourism and American political and economic involvement on every continent, overpopulation leading to poor hygiene, and pollution of the environment are just a few examples of causes contributing to the spread of parasitic infections. In a presentation of parasitic cases found in New York, Most justifiably refers to Manhattan as a "Tropical Isle."[4]

The majority of the parasitic infections diagnosed in our laboratory during the past years were neither cases imported from the tropics after a short vacation trip, nor infections brought to New York by visitors or immigrants from endemic areas, but those found among local residents who had never been outside New York.

The availability of a reliable laboratory is only one prerequisite for making a diagnosis of a parasitic infection. The other indispensable requirement is the recognition at the clinical level of the case in which such an infection should be investigated.

In this parasitology laboratory, stool examinations had revealed frequent infection with several species of intestinal parasites, both pathogenic and nonpathogenic, indicating foci of poor hygiene and easy transmissibility in the population of Brooklyn served by Kings County Hospital Center.

Methods

A comparative study was conducted for 3 consecutive months on two groups of stool examinations. The first group was requested by physicians who suspected the patients of harboring intestinal parasites. This group represents routine examinations performed by the parasitology laboratory. The second group included examinations for parasites on stools sent to the laboratory to be tested for occult blood. The stool specimens in the second group were from patients not suspected of harboring parasites, and examinations for ova and parasites were not requested.

The specimens in both groups came from demographically similar patients residing in the same city area. In many instances patients in both groups had comparable ill defined symptoms of weakness, vague abdominal discomfort, and anemia.

Every stool specimen was examined by a direct smear, using saline in conjunction with Lugol's solution, and by a modification of Ritchie's formalin-ether centrifugation method.[5] The identification of protozoa and cysts was confirmed by trichrome staining performed on unformalized portions of specimens kept in the refrigerator.

Results

Table 1 demonstrates that among 1801 examinations for parasites, 919 were requested by the physicians, and 882 were not.

The percentages of parasitic infections are listed by species of parasites. Since many stool specimens revealed infections with several species, neither group represents the rate of infection in the local population. However, the table allows a comparative study of infection with the same species of parasites in patients suspected of harboring parasites and in those that were not.

Discussion

As would be expected, the percentage of parasitic infections was greater in specimens from patients with clinical symptoms related to parasitosis. However, infections with pathogenic parasites were also detected among patients not suspected of harboring parasites, e.g., six examinations positive for *Giardia lamblia*, 64 for *Trichuris trichiura*, three for *Entamoeba histolytica*, and 17 for hookworm infection. Symptoms such as anemia in hookworm-infected patients may have been ascribed to other causes of intestinal bleeding. It is noteworthy that some pathogenic parasites were found more frequently in the patients on whom no examination for parasites was requested, e.g., *Schistosoma mansoni* and *Enterobius vermicularis*.

The infection patterns varied for the parasites which are considered to be nonpathogenic. *Entamoeba coli* was distributed equally among both groups. The high rate of infection with this parasite has an epidemiological implication. In fact, the presence of even nonpathogenic amebae in the stools indicates a reservoir of infection and a low standard of hygiene among the population.

TABLE 1—Infection with Various Species of Parasites in Two Groups of Examinations

Parasite	Positive Stool Examinations	
	Requested by physicians	Not requested by physicians
	No. (%)	
Ascaris lumbricoides	34 (3.6)	5 (0.6)
Hookworm	20 (2.2)	17 (1.9)
Trichuris trichiura	120 (13.1)	64 (7.2)
Strongyloides stercoralis	16 (1.7)	8 (0.9)
Enterobius vermicularis	2 (0.2)	3 (0.3)
Schistosoma mansoni	2 (0.2)	4 (0.5)
Hymenolepis nana	3 (0.3)	0 (0.0)
Entamoeba histolytica	5 (0.5)	3 (0.3)
Entamoeba coli	36 (3.9)	35 (4.0)
Iodamoeba bütschlii	1 (0.1)	1 (0.1)
Endolimax nana	40 (4.3)	25 (2.8)
Giardia lamblia	30 (2.2)	6 (0.6)
Chilomastix mesnili	1 (0.1)	1 (0.1)
Total positive examinations	310 (33.7)	172 (19.5)
Total examinations	919	882

Conclusions

The most important conclusion that can be drawn from the high percentage of parasitic infections in patients not suspected of harboring parasites is that good clinical criteria for requesting stool examination for parasitic information are not always available.

This study suggests the usefulness of routine stool examinations for screening unsuspected parasitosis in selected urban populations with high rate of infection and poor hygienic standards, even outside tropical endemic areas.

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Carbon Monoxide in School Buses

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Introduction

On December 16, 1971, eight children became ill on a school bus carrying a group of children enrolled in a private school. Symptoms included drowsiness, headache, and nausea. Five of the children were sufficiently ill that they were taken to the emergency room of a hospital. One of the five was unconscious. The symptoms were found to be due to carbon monoxide (CO) poisoning. All of the children had been seated in the rear of the bus, which had a rear-mounted engine and was later found to have a defective exhaust system.

The Seattle-King County Department of Public Health was notified of the incident and an investigation was conducted. All five buses operated by the school had significant levels of carbon monoxide in the passenger compartment, ranging from 10 to 25 parts per million (ppm) with a mean value of 15 ppm. The bus in which the children