

Diagnostic value of fecal leukocytes in chronic bowel diseases

*Study carried out at the Department of Clinical Medicine of the Medical Science Faculty of Campinas State
University, UNICAMP.*

To evaluate the importance of fecal leukocytes, 42 patients who showed signs of
fecal leukocytes (++ or +++) were studied.

Their endoscopic examinations with biopsy and/or radiology of the colon showed the following diagnoses: 33 had
ulcerative colitis, four had colonic adenocarcinoma, two had Crohn's disease, two had amebic colitis and one had
eosinophilic colitis. The presence of fecal leukocytes allowed for the diagnosis of colon disease in all the patients, and it
might indicate exudative bowel disease. These results suggest that whenever fecal leukocytes are found in the feces, an
examination for colon disease should be made.

Key words: Fecal leukocytes, Inflammatory bowel disease, Exsudative bowel disease

INTRODUCTION

The diagnosis of inflammatory bowel disease usually requires uncomfortable tests, such as radiology and endoscopy. Many authors have tried non-invasive tests to screen patients who needed more aggressive supplementary examinations. Indium-111 labeled leukocytes have been found in inflammatory bowel diseases (5,9,10). Many authors have determined that the presence of fecal leukocytes depends primarily on a rupture of the integrity of the intestinal mucosa (3,4,8,12). Feinberg (3) had proposed a rapid and less-complicated method to perform fecal examinations which required only 75 minutes to stain.

The immediate examination of stools stained with lugol for leukocytes is a rapid and reliable procedure that can offer much useful information and may be a valuable aid toward early diagnosis of the cause of diarrhea (3,4,8). It only needs a microscope and may be used by physicians at the office.

Address for correspondence: Dr. Adriana Seva Pereira
Av. Dr. Hermas Braga, 120 – CEP 13092-330
Campinas – São Paulo – Brazil

In this study, an analysis was carried out to determine the value of fecal leukocytes in the diagnosis of chronic bowel diseases.

METHODS

Fresh stool specimens from each patient were examined for leukocytes. A small fleck of stool was placed on a clean glass slide and mixed with two drops of lugol (12). The slide was then covered with a coverslip and examined under a light microscope (150, 300 and 600 x).

The presence of fecal leukocytes had been analyzed by Laboratory of Gastroenterology of HC-UNICAMP criteria which have been standardized since 1974. It measures both the quantity of leukocytes and fecal material, as Drummey et al (12) described from the butter stool's research. The semi-quantitative analysis showed the following results:

1. negative (-) or absence of fecal leukocytes: no leukocytes are seen.
2. + (small quantity of fecal leukocytes): rare leukocytes are seen by field and abundant fecal material.

3. ++ (regular quality of fecal leukocytes): many leukocytes, up to 100 by field, but regular fecal material.
4. +++ (high quantity of fecal leukocytes): numerous leukocytes, 100 or more by field, and little fecal material (figure 1).

PATIENTS

From 1986 to 1990, 1,680 patients with chronic diarrhea were examined. Fecal leukocytes ++ or +++ were detected in 69 patients. All of them were submitted to contrast x-ray of the large intestine, rectosigmoidoscopy and colonoscopy with biopsy. Twenty-seven patients were lost in the follow-up; 42 were submitted to at least one of the examinations with conclusive diagnosis.

Out of 42 patients, 24 were men and 18 women, ages 18 to 77 years (mean: 43.86; s.d.: 15.06). Their data are summarized in table 1.

RESULTS

The results are summarized in table 1.

DIRECT MICROSCOPIC FECES EXAMINATION—The direct microscopic feces examination showed regular quantity of leukocytes (++) in eight patients and high quantity (+++) in the other 34.

DIAGNOSIS

For 42 patients, a definitive diagnosis was estab-

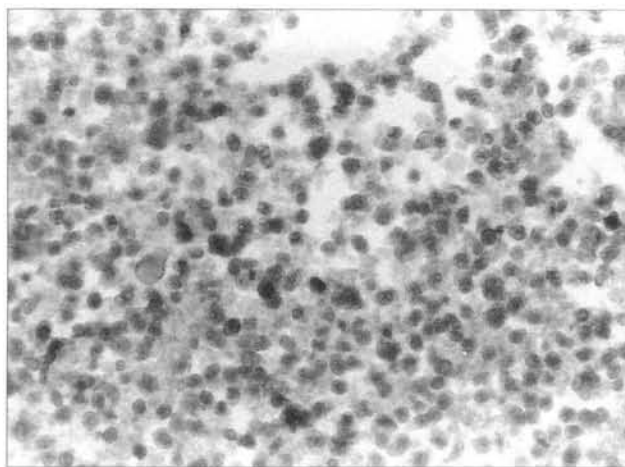


Figure 1 – High quantity (+++) of fecal leukocytes and little fecal material (300x).

Table 1
Identification of 42 patients and their diagnosis.

Identification\Diagnosis	UC	Ca	Crohn	AC	EC	
N	26	4	3			
1	1					
Age (yrs)	variation	18-77	33-74	30-46	30-45	50
	mean	43.2	54.2	38.0	37.5	
	s.d.	15.3	17.3	11.3	10.6	
Sex	male	18	2	1	2	1
	female	15	2	1	0	0

UC: ulcerative colitis

Ca: colonic adenocarcinoma

AC: amebic colitis

EC: eosinophilic colitis

lished by radiologic or endoscopic examinations and in one, by surgical biopsy. The conclusive diagnoses were ulcerative colitis in 33 patients, colonic adenocarcinoma in four, Crohn's disease in two, amebic colitis in two and eosinophilic colitis in one.

DISCUSSION

Microscopic examination of feces has been recognized as very important for diagnosis of acute diarrhea (1,3,4). Bearzoti and Reis Filho (1) emphasized the value of fecal leukocytes in children with acute diarrhea. Harris et al. (4) concluded that the presence of fecal leukocytes indicated rupture of the distal mucosa because they did not find fecal leukocytes in healthy controls or in volunteers with non-invasive bacterial diarrhea.

Studies of 430 children with acute diarrhea showed a direct correlation between fecal leukocytes and bacteria known to penetrate the mucosa, such as Shigella and Salmonella (7).

These studies suggest that the presence of fecal leukocytes in patients with acute diarrhea depends primarily on rupture of the intestinal mucosa.

Harris et al. (4) studied only two patients with ulcerative colitis who showed signs of leukocytes and red cells in the feces. Other authors, using Indium-111 labeled leukocytes, verified that radioactivity was concentrated in the tender region and the fecal radioactivity should identify inflammatory bowel disease (5,6,9,10,11). This non-invasive method is useful in the diagnosis and in the follow-up of patients with inflammatory bowel disease (9);

otherwise, it is not available in our environment.

The examinations carried out in all of 42 patients who showed signs of regular or high quantity fecal leukocytes (contrast x-ray of large intestine, rectosigmoidoscopy and colonoscopy with biopsy) showed exudative bowel disease: 33 ulcerative colitis, four colonic adenocarcinoma, two Crohn's disease, two amebic colitis and one eosinophilic colitis. Because this is a quick and simple technique, the possible value of semi-quantitative fecal leukocytes in predicting exudative disease of the colon is suggested through our results. On the other hand, other invasive procedures, such as sigmoidoscopy, colonoscopy, opaque enema or surgery may be needed to further elucidate the nature of the disease.

CONCLUSIONS

The presence of fecal leukocytes was closely associated with intestinal disease in all 42 cases with chronic diarrhea. The majority of the cases had inflammatory etiology (ulcerative colitis, Crohn's disease, amebic colitis or eosinophilic colitis) and in four, the origin was neoplastic (colonic adenocarcinoma). The simple observation of fecal leukocytes, a simple and reliable screening test, is therefore an indicator for exudative enteropathy.

REFERENCES

1. BEARZOTI, P. & REIS FILHO, I. – O exame direto a fresco das fezes nas diarreias infantis. **Pediatria Prática**, **41**: 321-324, 1970.
2. DRUMMEY, G. D.; BENSON Jr., J.A. & JONES, M. C. – Microscopic examination of the stool for steatorrhea. **N Eng J Med**, **264**: 85-7, 1961.
3. FEINBERG, S. N. – A simple method for cytologic examination of diarrheal stools. **Am J Pathol**, **57**: 387-390, 1972.
4. HARRIS, J. C.; DUPONT, H. L. & HORNICK, R. B. – Fecal leukocytes in diarrheal illness. **Ann Int Med**, **76**: 697-703, 1972.
5. LEDDIN, D. J.; PATTERSON, W. G. & DACOSTA, L. R.; et al. – Indium-111 labeled autologous leukocyte imaging and fecal excretion. Comparison with conventional methods of assessment of inflammatory bowel disease; **Dig Dis Sci**, **32**: 387, 1987.
6. McAFEE, J. G.; GAGNE, G. M. & SUBRAMANIAN, G.; et al. – Distribution of leukocytes labeled with Indium-111 oxine in dogs with acute inflammatory lesions. **J Nucl Med**, **21**: 1059-1068, 1980.
7. PEREIRA, A. S.; MAGALHÃES, A. F. N. & PEREIRA FILHO, R. A. – O valor do exame direto das fezes nas diarreias infantis. *Pediatrics Congresses (XI Panamericano and IV Latinoamericano)*, São Paulo, 1975.
8. PINK, I. J.; CROFT, D. N. & CREAMER, B. – Cell loss from small intestinal mucosa: a morphological study. **Gut**, **11**: 217-222, 1970.
9. SAVERYMUTTU, S. H.; PETERS, A. M.; LAVENDER, J. P.; et al. – Indium-111 labeled autologous leukocytes in inflammatory bowel disease (abstract). **Gastroenterology**, **80**: 1273, 1981.
10. SAVERYMUTTU, S. H.; PETERS, A. M.; LAVENDER, J. P.; et al. – Quantitative fecal Indium-111 labeled leukocyte excretion in assessment of disease in Crohn's disease. **Gastroenterology**, **85**: 1333-1339, 1983.
11. SEGAL, A. W.; MUNRO, J. R.; ENSELL, J.; et al. – Indium-111 tagged leukocytes in the diagnosis of inflammatory bowel disease. **Lancet**, **2**: 230-232, 1981.
12. VILELA, M.P. – *Síndromes coprológicas*. São Paulo, Sarvier, 2ª ed., 40-41, 1967.

RESUMO

Foram estudados pacientes com diarreia crônica, dos quais 42 apresentaram leucócitos nas fezes (++ ou +++). Nestes, os exames endoscópicos com biópsia e/ou radiológico do cólon firmaram os seguintes diagnósticos: retocolite ulcerativa inespecífica em 33, adenocarcinoma do cólon em 4, doença de Crohn em 2, colite amebiana em 2 e colite eosinofílica em 1 paciente. A presença dos leucócitos nas fezes permitiu, então, o diagnóstico de doença do cólon em todos os pacientes, podendo ser indicativo de doença exsudativa do intestino. Estes resultados sugerem que sempre que forem encontrados leucócitos nas fezes devem ser pesquisadas doenças do cólon.