



THE ROLE OF ROUTINE STOOL EXAMINATION IN THE MANAGEMENT OF PATIENTS PRESENTING WITH CHRONIC LOWER ABDOMINAL PAIN OF GASTROINTESTINAL ORIGIN

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ABSTRACT

A prospective case series study was conducted over two months with 60 subjects at a tertiary hospital to assess the role of routine stool examination in the management of patients presenting with chronic lower abdominal pain of gastrointestinal origin. The objective was to assess stool examination as a diagnostic tool as well as to research and promote preventive hygiene measures.

Method- Data was collected and analyzed with demographic data tabulated under the headings of age, gender, socioeconomic status, type of work, dietary habits, food washing habits before cooking, type of drinking water, handwashing habits before eating and toilet usage and whether there was a toilet at home. Clinical data was noted as type of pain, history of any previous infection, ova/cyst/ trophozoites found in stool samples, diarrhea, anemia and presence of stool occult blood.

Results- Intestinal parasites were detected in 18.3% stool samples. 18.3% did not wash their food before cooking while 41.7% consumed unfiltered tap water as drinking water, 61.7% did not have toilet facilities at home and 58.3% did not wash their hands before eating. Results were statistically significant.

KEYWORDS : Stool examination , Chronic lower abdominal pain

INTRODUCTION:

Chronic abdominal pain is a common complaint presenting to the surgical out-patient department. The causes vary widely, ranging from bacterial infections, worm infestations and irritable bowel syndrome to life-threatening conditions such as ulcerative colitis and intestinal malignancies. Stool examination becomes a mandatory investigation in all these patients^{1,2}. It is a simple, cheap and easy to perform a preliminary examination that can be done in most laboratories without sophisticated equipment. Microbial or parasitic infections of the gastrointestinal tract are rampant in our country and form a major bulk of these patients that can be diagnosed with a stool examination without resorting to expensive tests^{3,4}. The importance of advanced diagnostics, however, cannot be denied and stool culture or other immunology based tests may be then be asked for in specific situations^{5,6}. In complicated conditions, stool examination would give a preliminary direction to the diagnosis, and special investigations can follow for management of the case e.g. an elderly patient with positive occult blood in the stool can then be investigated further to rule out a malignancy.

The specific objectives of this study were to:

1. Perform a routine microscopic stool examination in patients presenting with chronic lower abdominal pain of gastrointestinal origin.
2. Analyze and interpret the stool examination report in the context of the patients' complaints thereby contributing to the diagnosis and there onwards focused specific treatment.
3. Educate the study group regarding basic hygiene and sanitation, to reduce the spread of bacterial and parasitic infections, thereby promoting a healthier community.

MATERIALS AND METHODS:

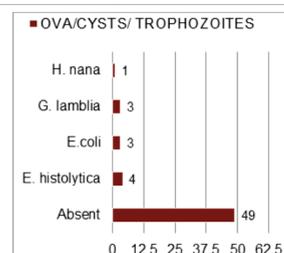
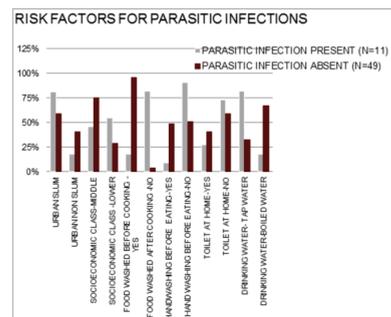
This was a prospective case series study conducted at a tertiary level teaching hospital in Mumbai. The total period of study was 2 months and the sample size was 60 patients. All patients, irrespective of age or gender, presenting with chronic abdominal pain, including acute exacerbations, suspected to be of gastrointestinal origin and giving consent for participation in the study were included. Patients with acute abdominal pain requiring a surgical intervention were excluded from the study. Internal quality control of the laboratory is done in-house regularly, while external quality control is done through a tie-up with the All India Institute of Medical Sciences, New Delhi and Christian Medical College, Vellore. Permission of the Institutional Ethics Committee was taken before the commencement of the study. Informed written consent was also taken from each patient before being included in the study.

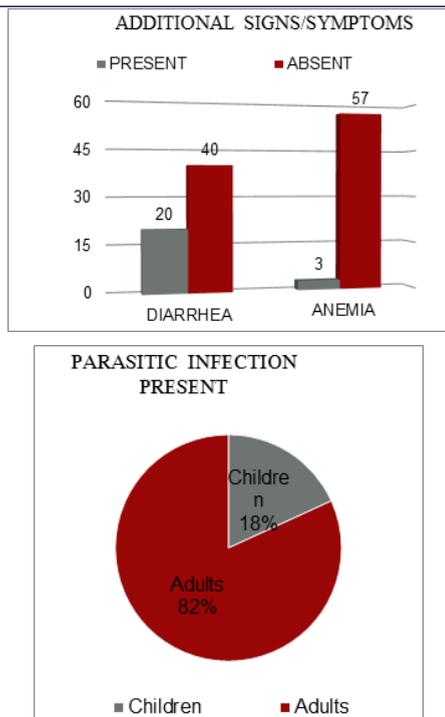
Data were collected from all patients in the form of a detailed history

and demographic data, clinical history and examination findings were recorded with the help of a predesigned, pretested, structured questionnaire. A stool sample was collected from each patient in a wide-mouthed, clean, leak-proof container for detection of ova, cysts or trophozoites. Samples were sent to our laboratory for macroscopic examination for colour, consistency and presence/absence of mucus. Microscopic examination using a saline wet mount was done for the detection of trophozoites, cysts of protozoa, eggs, and larvae of helminths, and iodine wet mount for the study of nuclear characters of cysts and trophozoites to identify the species. The chemical examination for occult blood was done by testing 3 samples taken on consecutive days. Stool cultures were done in specific situations as required.

Data entry was done using MS-Excel. Numerical data were summarized using Mean and Standard Deviation. Categorical data were summarized using Percentage. Chi-square test / Fisher's exact test was applied to find out the p-value to assess the significance of each risk factor (Categorical data). $p < 0.05$ was considered as statistically significant. The results were then interpreted in the context of the overall objectives of the study to draw relevant conclusions. The help of a statistician was taken in this regard.

RESULTS & DISCUSSION





Our study of 60 participants observed 28 male (46.7%) and 32 female (53.3%) participants. A study conducted by Mahendra Raj et al¹² on Intestinal helminthiasis and abdominal symptoms in adults, observed association between intestinal nematode infection and abdominal symptoms only in females. Their results showed 68% stool positive symptomatic females and 30% stool negative symptomatic females with no significant difference in males. However, our study did not show a similar association.

Parasitic infestation and/or any other infection is more common in children due to a lack of knowledge about hygiene. Younas et al⁸ studied frequency of *Giardia lamblia* infection in children with recurrent abdominal pain. 30.96% of their study samples were positive for *Giardia lamblia* in stool samples. Their study concluded that poor health hygiene, poor toilet training, overcrowding and low socio-economic status were the observed risk factors for *Giardia* infection. Our study showed 13(21.7%) patients under 10years, 7(11.7%) in 11-20years age group, 18 in 21-30years group(30%), 7 in 31-40years age group(11.7%), 10 in 41-50years age group(16.7%) and 5(8.3%) greater than 50 years of age. Chronic abdominal pain appeared in all age groups, the youngest is 3 years and the oldest is 78 years, but the highest incidence was seen in the 21-30 years age group(30%) and second highest in under 10yrs age group(21.7%). Parasitic infection was detected in 11 patients, of which 2(18.18%) were children under 10 years of age and 9(81.8%) were adults.

Microscopic examination showed cysts of following parasites in our study: *E. histolytica* in 7 patients(11.7%), *G. lamblia* in 3 (5%) and *H.nana* in 1(1.7%). No ova, cysts or trophozoites of parasites were found in 49(81.7%) patients. Less occurrence of infestation in our study could be due to a limited sample size and study duration. Parasitic infection is an important cause of communicable diseases in India in areas with lack of hygiene and sanitation. Zdero et al³ carried out a study to detect parasites in stools of patients presenting with chronic gastrointestinal symptoms and detected *B. Hominis*(15.7%), *G. Lamblia*(7.5%), *Cryptosporidium sp.*(1.6%), *E.coli*(3.3%), *C.Mesnili*(1.1%), *A.Duodenale*(0.5%), *A Lumbricoides*(0.5%), *E.vermicularis*(0.5%), and *E.nana*(0.5%) of their studied patients. Tuncay et al⁶ found 41 cases of 9378(0.44%) to be cyst positive for *E.histolytica* / *E.dispar*. Victor Heras-Canas et al¹³ study on chronic abdominal pain patients revealed that *H. pylori* was found in 226 (22.3%) of 1240 samples and intestinal parasites were detected in 115 (4.05%) of 2840 stool samples. Younas et al⁸ studied recurrent abdominal pain in children and reported 74(30.96%) of 239 children positive for *Giardia* cysts and trophozoites in their stool samples.

The majority of our participants(63.3%) were residing in urban- slum areas. Our study did not show the area of residence as a major risk

factor ($p=0.288$) even though slum areas are associated with poor hygiene and sanitation thus increasing the risk of intestinal infestations. Escobedo et al⁹ reported that children living in rural areas had the highest infection rates according to demographic data. Younas et al⁸ observed that poor health hygiene is a risk factor for giardiasis.

A study done in Spain by Victor Heras-Canas et al¹³ reports that the prevalence of *H. pylori* and/or parasites depends on the socio-demographic setting. The review on persistent digestive disorders by Becker et al¹¹ highlights the importance of socio-economic status. A study by Younas et al⁸ in Pakistan, stated that low socio-economic status is a risk factor, observed in children with recurrent abdominal pain diagnosed with *G.lamblia* infection. In our study ($p=0.194$), the majority of the patients belonged to middle class i.e. 40(66.7%) patients. 20(33.3%) belonged to lower class or below the poverty line. It was observed that patients belonging to the middle class i.e. class III and IV had a higher prevalence of chronic abdominal pain as compared to the others ($p=0.194$). We concluded that the lower socio-economic class did not appear independently as a risk factor for gastrointestinal infections.

We tested four parameters to understand the prevention of parasitic ailments by following simple hygiene measures: 1. Food washed before cooking or not. 2. Type of drinking water 3. Hand-washing before eating 4. Toilet facilities available at home.

We found that 49(81.7%) of our participants washed their food before cooking, yet there is a proportion of patients that do not (11 participants =18.3%). This difference was proved significant statistically by using the Chi-square test/Fisher's exact test and calculating the p-value ($p=<0.001$). Thorough washing of raw vegetables and fruits is essential if consumed in the form of salad since it removes contaminants such as ova of parasites.

Primary prevention of water-borne diseases involves boiling water before drinking. In our study it was observed that 35(58.3%) consumed boiled or filtered water whereas 25(41.7%) consumed direct tap water. 9 of 11 patients (81.8%) with parasitic infection proved on stool examination consumed tap water, $p=0.008$, which is statistically significant. Escobedo et al⁹ highlighted the importance and association of intestinal parasitic infection with source of drinking water and personal hygiene habits. Sejdini et al¹⁴ concluded that drinking contaminated water and close contact with animals were the main routes for transmission of *G. duodenalis* to humans. Their study also mentions wastewater treatment and proper waste disposal are necessary to control food and water-borne diseases. The study by Becker et al¹¹ said that diarrhoea and other digestive disorders are common in the tropics due to lack of access to clean water, adequate sanitation and poor hygienic conditions. In our country, the boiling of drinking water is the easiest and cheapest solution for the ordinary citizen.

Only 25 participants in our study practiced hand washing before eating (41.7%), while the other 35 (58.3%) did not do so. 10 out of 11 patients(90.9%) with parasitic infection did not regularly wash their hands before eating; $p = 0.037$ which is statistically significant.

Only 23(38.3%) of our participants had toilets at home, whereas 37(61.7%) used the community toilets. The $p = 0.629$ though not appearing statistically significant, could still be a major cause of community-acquired diseases.

20 (33.3%) of our participants suffered from diarrhea along with chronic abdominal pain. Most patients complaining of this symptom may be passing loose stools with mucus regularly. Their complaints continue despite treatment. The reason being though anti-amoebic treatment may be successful, complete pathogen eradication and cure cannot be achieved until predisposing factors are removed to prevent reinfection. Huppertz et al⁷ study on acute and chronic diarrhea and its association with abdominal colicky pain had concluded that EAEC (Enteric Aggressive E.Coli) was one of the main causes of this condition and stool examination was used for diagnosis. Another study on abdominal pain and diarrhea, done by M.C.Alcantara-Zafra et al¹⁰ highlighted that *S. stercoralis* could be the cause and a stool examination would help detect it.

Occult blood was positive in 2(3.3%) of our patients. Positive tests are indications for carrying out further investigations such as upper and

lower gastrointestinal endoscopy. Fotedar et al⁵ study said that occult blood was positive in stools of patients who were infected with *E. histolytica* since the parasite invades the colonic mucosa. Chronic acid peptic disease with small amounts of bleeding is one of the commoner causes of this finding. However, the more dangerous cause is a gastrointestinal malignancy. The two patients in our study with occult blood positive stool report were suffering from chronic peptic ulcer disease as proved on upper gastrointestinal endoscopy and were treated accordingly.

CONCLUSION

Routine stool examination is an extremely useful investigation in all cases of chronic lower abdominal pain, especially when a parasitic infection is suspected. It helps to establish an early diagnosis in these patients, thereby leading to prompt and effective treatment. Maintaining personal/toilet hygiene and that of the surroundings is encouraged as this can go a long way in preventing infectious and communicable diseases spreading via the feco-oral route. A message to the community through the participants of this study promotes preventive health practices to the entire population.

REFERENCES

1. Fischbach FT, Dunning MB III, eds.(2009). Manual of Laboratory and Diagnostic Tests, 8th ed. Philadelphia:Lippincott Williams and Wilkins.
2. Bailey and Scott's Diagnostic Microbiology 13th edition by Patricia .M. Tille
3. M. Zdero, G. Cabrera, P. Ponce de León, I. Nocito, and C. Echenique, "[Parasitosis in an adult population with chronic gastrointestinal disorders].," *Acta Gastroenterol. Latinoam.*, vol. 27, no. 2, pp. 67–73, Jan. 1997.
4. Anand AC , Reddy PS, Saiprasad GS, Kher SK, "Does non-dysenteric intestinal amoebiasis exist?," *Lancet.* 1997 Jan 11 ; 349(9045) : 89-92.
5. R. Fotedar, D. Stark, N. Beebe, D. Marriott, J. Ellis, and J. Harkness, "Laboratory diagnostic techniques for Entamoeba species.," *Clin. Microbiol. Rev.*, vol. 20, no. 3, pp. 511–32, table of contents, Jul. 2007.
6. Tuncay S, Inceboz T, Over L, Yalcin G, Usluca S, Sahin S, Delibas SB, Aksoy U, "The evaluation of the techniques used for diagnosis of Entamoeba histolytica in stool specimens." *Turkiye Parazitol Derg.* 2007;31(3):188-93.
7. H. I. Huppertz, S. Rutkowski, S. Aleksic, and H. Karch, "Acute and chronic diarrhoea and abdominal colic associated with enteroaggregative Escherichia coli in young children living in western Europe.," *Lancet (London, England)*, vol. 349, no. 9066, pp. 1660–2, Jun. 1997.
8. M. Younas, S. Shah, and A. Talaat, "Original Article Frequency of Giardia lamblia Infection in Children with Recurrent Abdominal," pp. 171–174.
9. A. A. Escobedo, R. Cañete, and F. A. Núñez, "Prevalence, risk factors and clinical features associated with intestinal parasitic infections in children from San Juan y Martínez, Pinar del Río, Cuba.," *West Indian Med. J.*, vol. 57, no. 4, pp. 377–82, Sep. 2008.
10. Alcántara-Zafra MC, Martínez-Jiménez T. Abdominal pain and diarrhea in patients from Ecuador. *Rev Esp Enferm Dig.* 2010 Sep;102(9):566-7.
11. S. L. Becker, J. Vogt, S. Knopp, M. Panning, D. C. Warhurst, K. Polman, H. Marti, L. von Müller, C. P. Yansouni, J. Jacobs, E. Bottieau, M. Sacko, S. Rijal, F. Meyanti, M. A. Miles, M. Boelaert, P. Lutumba, L. van Lieshout, E. K. N'Goran, F. Chappuis, and J. Utzinger, "Persistent digestive disorders in the tropics: causative infectious pathogens and reference diagnostic tests.," *BMC Infect. Dis.*, vol. 13, p. 37, Jan. 2013.
12. S. Mahendra Raj, S. Sivakumaran, and S. Vijayakumari, "Intestinal helminthiasis and abdominal symptoms in adults.," *Trop. Gastroenterol.*, vol. 12, no. 1, pp. 21–4, Jan. .
13. Víctor Heras-Cañas, José Gutiérrez-Fernández , Inés Pérez-Zapata and José María Navarro-Mari. Department of Microbiology. Hospital Virgen de las Nieves. Granada, Spain. School of Medicine. Universidad de Granada. Granada, Spain. M. Hallett, R. a T. Human, and C. Physiology, "Letters To the Editor Letters To the Editor," vol. 15, no. 1, pp. 1106–1107, 1992
14. A. Sejdini, R. Mahmud, Y. A. L. Lim, M. Mahdy, F. Sejdini, V. Gjoni, K. Xhaferraj, and G. Kasmi, "Intestinal parasitic infections among children in central Albania.," *Ann. Trop. Med. Parasitol.*, vol. 105, no. 3, pp. 241–50, Apr. 2011