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''बेटी बचाओ, बेटी पढाओ''

Stool Diagnosis in Vedic era VS Modern era

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ABSTRACT

In Djottin, Cameroon, researchers are looking for a new method for stool concentration and to determine the prevalence of intestinal parasite infection among primary school students. Among the approaches discussed above, Ritchie's method (1948) is highlighted, which is based on a well-established methodology for diagnosing helminths and protozoa in faeces using centrifugal sedimentation in a formaldehyde ether solution. In a centrifuge tube, 1 gramme of stool sample was emulsified in 10 mL of normal saline and spun at

3.0 rpm for 10 minutes. The supernatant was thrown away. To wash the stool sample, this procedure was repeated twice. The students T-Test was used to statistically analyse the data received from the evaluation of the stool samples and other parts of this study. formol-petrol, and direct sme. One of the problems impeding accurate diagnosis is the high expense of proper stool testing using the concentration approach, which this study addresses by offering a less expensive and more effective method.

Keywords: Stool test, Fecal occult blood, Formol-petrol concentration technique and Ritchie's method.

INTRODUCTION:

A stool test is a procedure that involves collecting and analysing faeces to determine the presence or absence of a medical disease.

In the office or at the bedside, the patient and/or health care worker might make some critical observations.

- Color
- Texture/consistency—formed

The faecal occult blood test, one of the most frequent stool tests, can be used to diagnose a variety of gastrointestinal disorders that cause bleeding, such as colorectal cancer or stomach cancer. [1] Cancers, as well as precancerous lesions to a lesser extent, shed aberrant cells intothe stool. [2] Cancers and precancerous lesions (polyps) that are ulcerated or scraped by passingstool can also bleed blood, which can be detected with a haemoglobin assay. [2] Beginning at age 50, the American Cancer Society suggests screening with DNA testing every three years, guaiac faecal occult blood test every year, or faecal immunochemical test every year. [3] Other choices include colonoscopy every 10 years or sigmoidoscopy or

virtual colonoscopy (CT colonography) every five years. [4] In 2016, the United States Preventive Services Task Force modified its colorectal cancer screening guideline statement. [5]

In 2016, the National Comprehensive Cancer Network (NCCN) released screening recommendations.[6] The Healthcare Effectiveness Data and Information Set (HEDIS) was updated in 2016 by the National Committee for Quality Assurance (NCQA).[7] In August 2014, the FDA approved a DNA test using stool samples as a screening test for non-symptomatic, average-risk persons 50 years or older. [8] According to a 2017 study, this testing is less cost effective than colonoscopy or faecal occult blood tests. [9] When comparedto no screening, three-year sDNA screening is predicted to cost $11,313 each quality adjusted life year (QALY). [10] **Melena** refers to the dark black, tarry feces that are associated with upper gastrointestinal bleeding.[1] The black color and characteristic strong odor are caused by hemoglobin in the blood being altered by digestive enzymes and intestinal bacteria.[2] Iron supplements may cause a grayish-black stool that should be distinguished from melena,[3] as should black coloration caused by a number of medications, such as bismuth subsalicylate (the active ingredient in Pepto-Bismol), or by foods such as beetroot,black liquorice, or blueberries.[4]Other tests look for globin, DNA, or other blood factors including transferrin, while conventional stool guaiac tests look for heme.

MODERN TECHNIQUES: Fecal occult blood (**FOB**) FOB stands for faecal occult blood, which refers to blood in the faeces that is not visible (unlike other types of blood in stool such as melena or hematochezia). A faecal occult blood test (FOBT) examines the stool for hidden (occult) blood (feces). [1]

Sigmoidoscopy: It is a minimally invasive medical examination of the large intestine from the rectum to the sigmoid colon, which is the closest region of the colon. Flexible sigmoidoscopy, which employsa flexible endoscope, and rigid sigmoidoscopy, which uses a rigid instrument, are the two varieties of sigmoidoscopy

The most common procedure is flexible sigmoidoscopy. A sigmoidoscopy is comparable to a colonoscopy, but it is not the same. A sigmoidoscopy just looks at the sigmoid, the farthest section of the colon, whereas a colonoscopy looks at the entire large intestine**Virtual colonoscopy** (VC, also called **CT colonography** or CT pneumocolon): Virtual colonoscopy is a medical imaging method that involves using x-rays and computers to create two- and three-dimensional images of the colon (large intestine) from the rectum to the small intestine's lower end and displaying them on a screen. [1] The operation is used to diagnose polyps, diverticulosis, and cancer in the colon and intestine. VC is done using computed tomography (CT), often known as a CAT scan, or magnetic resonance imaging (MRI) (MRI). [2] A virtual colonoscopy can provide three-dimensional reconstructed endoluminal views of the bowel.

While VC preparations vary, patients are frequently instructed to take laxatives or other oral medications the day before the treatment to remove faeces from the colon. A suppository is also used to remove any residual faeces from the rectum. The patient may also be given a solution to coat any remaining faeces that haven't been removed.'Faecal tagging' is a term used when a laxative clears the bowels. This permits the user (typically a consultant radiologist) to efficiently delete the left-over faeces from the 3D pictures,which could otherwise result in false positive results.

VC takes place in the radiology department of a hospital or medical center. The examination takes about 10 minutes and does not require sedatives.

During the procedure:

- The patient is positioned on the examination table in a supine position.
- To reduce muscle activity in the area, the patient may be given an intravenous dose of Butyl scopolamine.
- A tiny tube is placed into the rectum, through which air is pumped to expand the colon, allowing for better visualization.
- As the table goes through the scanner, a sequence of two-dimensional cross-sections of the colon are produced. These photos are combined by a computer software to form a three- dimensional image that can be viewed on the video screen.
- To avoid image distortion, the patient is urged to hold his or her breath during the scan.
- The scan is then done in a prone position with the patient.
- The images produced by the scanner must be converted into a 3D image, +/- a fly through, after the examination (a cine programme which allows the user move through the bowel as if performing a normal colonoscopy). The results are evaluated by a radiologist to see whether there are any anomalies.

- The patient can resume normal activities after the procedure, but if abnormalities are discovered and a conventional colonoscopy is required, the treatment can be completed the same day. [3]

MICROBIOLOGICAL TEST:

The presence of worm larvae or eggs in faeces can be used to detect parasitic disorders such as ascariasis, hookworm, strongyloidiasis, and whipworm. A stool culture can be used to detect

several bacterial infections. Bacterial toxins, such as those produced by Clostridium difficile ("C. diff."), can also be identified. In addition, viruses like rotavirus can be discovered in stools. [11]

Ascariasis:

Ascariasis is a parasitic roundworm infection caused by Ascaris lumbricoides. [1] More than 85 percent of infections are asymptomatic, especially when the number of worms is low. [1] Shortness of breath and fever are common early on in the condition, and symptoms worsen with the number of worms present. [1] These symptoms may be followed by stomach swelling, discomfort, and diarrhoea. [1] Children are the most usually afflicted, and the infection can lead to poor weight gain, malnutrition, and learning difficulties in this age group. [1] [2] [5] The sight of the worm or eggs in faeces is used to make the majority of diagnosis. Because of the enormous quantity of eggslaid, doctors can only use one or two faecal smears to make a diagnosis. When the host passes a worm in the stool or vomit, the diagnosis is frequently made by chance. The eggs can be observed in a smear of fresh faeces studied under a microscope on a glass slide, and other processes, such as the ether sedimentation method or the Kato technique, can be used to concentrate them first or boost their visibility. The eggs are oval in shape, with a thick, mamillated shell (covered with rounded mounds or lumps) and a diameter of 35- 50 micrometres and a length of 40-70 micrometres. Larvae may be discovered in fluids aspirated from the lungs during pulmonary illness. Peripheral eosinophilia can be detected by counting white blood cells; this is typical in many parasite illnesses and is not unique to ascariasis. 15–35 on X-ray

Hookworms:

Hookworms are intestinal, blood-feeding, parasitic roundworms that cause types of infection known as helminthiases. In humans, hookworm infections are caused by two main species of roundworm belonging to the genera *Ancylostoma*, and *Necator*. In other animals the main parasites are species of *Ancylostoma*.

Strongyloidiasis:

Strongyloidiasis is a parasitic disease in humans caused by the nematode Strongyloides stercoralis, or occasionally S. fülleborni, a form of helminth. It's a type of nematode known as a roundworm. In disseminated disease, this intestinal worm can produce a variety of symptoms in patients, including skin symptoms, abdominal pain, diarrhoea, and weight loss, among many other specific and ambiguous symptoms, as well as serious life-threatening disorders through hyperinfection. Some people, especially those who are Strongyloides can create a hyperinfection state that can lead to death if not treated with corticosteroids or other immunosuppressive medications. Blood and stool tests are used to make the diagnosis. Strongyloidiasis is commonly treated with the drug ivermectin. The finding of larvae (rhabditiform and occasionally filariform) in the stool or duodenal fluid is used to make the

diagnosis. Because direct stool testing is rather insensitive, with a single sample only able to detect larvae in roughly 25% of instances, many samples may be required and not necessarily sufficient. [14] From the time of infection to the passage of larvae in the stool, it might take up to four weeks.

Wet mounts can be used to investigate the stool.

- Directly
- after concentration (formalin-ethyl acetate)
- after recovery of the larvae by the Baermann funnel technique
- after culture by the Harada-Mori filter paper technique
- after culture in agar plates

The most delicate procedures are cultural techniques, which are not widely available in the West. Culture is available in the UK at either the Liverpool or London Schools of Tropical Medicine. Because hookworm eggs hatch on chilling and the larvae are difficult to identify from Strongyloides, direct inspection on stool that has been collected recently and not allowed to cool is required.

CHEMICAL TEST: A fecal pH test may be used to determine lactose intolerance or the presence of an infection.[12] Steatorrhea can be diagnosed using a Fecal fat test that checks for themalabsorption of fat.[13] Faecal elastase levels are becoming the mainstay of pancreatitis diagnosis.

Fecal pH test:

1. A faecal pH test determines the acidity of a sample of faeces in order to diagnose a medical issue. In most cases, human faeces is acidic. An acidic stool may suggest a digestive issue such as lactose intolerance[1], a disease such as E. coli or rotavirus, or a combination of the two.

2. an overabundance of acid-producing bacteria (such as lactic acid bacteria for instance).

A pH of 6.6 is considered normal for a healthy person. [2]

Place of Study:

S.1tool samples were taken from 300 students from the various primary and nursery schools that were chosen for the study. The names of the students who would provide stool samples were drawn at random from the school registration, which was made available to the researcher by the principals. Early stool samples were collected in meticulously cleaned sample bottles and transported to Shisong's ST Elizabeth's Catholic Mission General Hospital for processing and analysis. The elementary school students, their teachers, and their parents all gave their permission to collect samples.

Parasitogical Technique:

The method adopted for direct smear formol-ether concentration and floatation techniques were supplied by WHO[16] and that described by Ukaga et al[15].

Formol-petrol concentration technique (developed by Vk Wirkom and EF TATA):

In a centrifuge tube, 1 gramme of stool sample was emulsified in 10 mL of normal saline and spun at 3.000 rpm for 10 minutes. The supernatant was thrown away. To wash the stool sample, this procedure was repeated twice. The silt was then resuspended in 7 mL of formol saline, 3 mL of petrol (super), and the mixture was forcefully agitated with a rubber bung. It was spun for 10 minutes at 3.000 rpm. It was divided into three sections. The sediment was at the bottom, followed by a layer of formol saline in the middle, and coarse faeces particles, fuel, and lipids at the top. Using a pasture pipette, the layers above the sediment were carefully aspirated and discarded. The sandstone

Identification of Intestinal Parasites:

The parasites were confirmed and identified by medical laboratory scientists in accordance with the bench aid for diagnosis of intestinal parasites [17]

Statistical Analysis:

The students T-Test was used to statistically analyse the data collected from the inspection of the stool samples and other components of this investigation. This helped determine if the effectiveness of intestinal parasites diagnosis is reliant on the procedures utilised, or if other characteristics such as sex, educational level, hygiene, and school staffing are linked to the prevalence of intestinal parasites.

RESULTS:

Formol-ether, formol-petrol, direct smear, and floating procedures were used to investigate 300 stool samples obtained at random from students in six different schools in Djottin for intestinal parasites. The formol-ether concentration found 90 percent of parasites, formol-petrol detected 102 percent, direct smear detected 61 percent, and flotation methods discovered 62 percent.

DISCUSSION:

The prevalence of intestinal parasites is fueled by a lack of effective diagnostic facilities and suitably qualified laboratory personnel, particularly in developing nations. In this regard, the Formol-petrol stool concentration technique (Wirkom-stool Tata's concentration method) was included in this study to raise the attention of the health sector in developing nations to an alternate approach of performing successful stool inspection at a reasonable cost. The formol- petrol method's parasite recovery rate of 34.50 percent, compared to 35.76 percent for formol- ether, 27.02 percent for direct smear, and 2.72 percent for salt floatation methods, is high enough to be considered one of the top stool testing methods in terms of effectiveness and cost. This finding is consistent with that of Oguoma and Ekwunife[18], who found a formol-ether recovery rate of 65.26 percent vs 34.74 percent for direct smear methods, demonstrating the superiority of the formol-ether methodology.

In this neighborhood, there are 32 students per instructor on average, and 68 students must queue to utilise one toilet squatting position. If parasite illnesses are to be controlled, a lack of training and bathroom facilities is a big concern. All of these things can contribute to a high prevalence and spread of intestinal parasites.

CONCLUSION:

In order to minimise the persistence of parasitic illnesses in underdeveloped nations, continued attention and sensitization on excellent personal and environmental hygiene is critical. This should be accomplished through effective child and adult education. In this view, the problem of teacher shortages in primary schools in developing nations must be appropriately addressed. In addition, a critical concern that must be addressed is the absence of well-trained health staff for diagnosing and treating intestinal parasite infections. One of the problems impeding accurate diagnosis is the high expense of proper stool testing using the concentration approach, which this study addresses by offering a less expensive and more effective method.

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