An Assessment of Faecal Occult Blood Test and H. pylori infection in Patients with Uninvestigated Dyspepsia in Primary Health Cares in Abakaliki, Nigeria

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Abstract

Test for faecal occult blood (FOB) is commonly used to evaluate patients with intestinal disorders. An assessment of FOBT and infection with H. pylori using standard techniques was conducted among dyspeptic patients attending primary health cares in Abakaliki, Nigeria. Of the 262 patients screened, 163(62%) were FOB+ of which 64 [39.3% ((95% CI: 29.2-48.8%) were H. pylori seropositive. FOB+ patients were more likely than were FOB- patients to be seropositive for H. pylori (39.3% vs. 5.1%, OR = 12.2). Although no relationship was found between FOBT result and presence of intestinal parasites (X2 = 9.4, p > 0.05), yeast cells were found more in stool samples of FOB+ than in FOB- dyspeptic patients [68 vs. 30 (95% CI: 0.051-0.329)]. FOBT remains a vital tool for assessing intestinal disorders and may be used for the initial evaluation and early management decisions when patients first present at the first visit to their GPs.

INTRODUCTION

Dyspepsia or more accurately, uninvestigated dyspepsia, a symptom complex arising in the upper gastrointestinal tract [1] has been described as a common complaint among individuals seeking medical care as well as people in the general population [2]. The symptom complex includes: upper abdominal/epigastric pain or discomfort, post-prandial fullness, bloating, belching, early satiety, anorexia, nausea, retching, vomiting, heartburn and regurgitation [2]. In absence of any underlying pathologies, such as peptic ulcer, gastroesophageal reflux, pancreatitis, biliary tract disease or others, dyspepsia is defined as functional or idiopathic dyspepsia. Data on dyspepsia prevalence, nearly all arising from studies in few developed geographical areas and countries, are of the order of 1-4% of all consultations in all primary care medicine [3]. However, estimates of adults affected by dyspepsia are as high as 20-40% [3, 4]. Variation in prevalence rates of dyspepsia has been partially related to difference in defining dyspepsia in the study population [5]. Although studies have shown that dyspepsia is associated with some physiological abnormalities [6,7,8,9], Helicobacter pylori (Hp) has been recognised as a key factor in the aetiology of various gastrointestinal diseases, ranging from chronic active gastritis without clinical symptoms to peptic ulceration, gastric adenocarcinoma and gastric mucosa-associated lymphoid tissue lymphoma [10,11]. The diagnosis of dyspepsia has been found to be challenging because patients often exhibit changing symptoms, and because characterisation of symptoms provide little information about the nature of the underlying physiologic abnormality [12]. In addition to history taking and standardised diagnostic techniques such as endoscopies, histological examination (H), rapid urease test (RUT) and ^{13}C-urea breath test (UBT) to diagnose H. pylori [13], faecal occult blood test (FOBT) is also used in the screening and monitoring of patients with gastrointestinal disorders [14, 15]. For instance, annual or biennial faecal occult screening has been shown to significantly reduce the incidence of colorectal cancer [16, 17]. Although upper gastrointestinal endoscopy is a valuable diagnostic tool, its role is controversial in patients with dyspepsia [18,19,20]. This study was aimed at providing baseline data on routine faecal occult blood testing and prevalence of H. pylori infection among dyspeptic patients attending primary health cares. The public health implications of the findings with reference to the general well being of dyspeptic patients are discussed.

MATERIALS AND METHODS

The study area is defined by longitude 8 ^{o} E and latitude 6 ^{o}

N, elevated at 380ft above sea level. The vegetation characteristic is that of the tropical rain forest with an average annual rainfall of about 1,600mm and an average atmospheric temperature of 30 ^{o} C. There are two distinct seasons, the wet and the dry seasons; the former takes place between April and October, while the latter occurs from November to March. The main occupation of the people is subsistence farming (mainly yam and cassava) with some animal husbandry and other professions and/ or activities such as civil service, trading, artisans, and stone quarrying.

This study was conducted at the Department of Chemical Pathology, Ebonyi State University, Abakaliki. The proposal for this study was approved by the Research and Ethics Committee of Ebonyi State University Teaching Hospital, Abakaliki. Participants were consecutive referrals from general practitioners (GPs) in Abakaliki metropolis who came for laboratory investigations as part of evaluation for various dyspeptic complaints. The clinical presentation, diagnosis, drug treatment and duration of symptoms were noted. Before enrolment, informed consent of the participants were sought and obtained. Patients that satisfied the conditions of not being on proton pump inhibitors, H_2 receptor blocker and non-steroid anti-inflammatory drugs (NSAIDs) for the past one month (4wks) were enrolled. Excluded from the study were patients with any known clinical conditions that may interfere with the result of this study, refusal to give consent or patients that have been on treatment with non-steroid anti-inflammatory drugs (NSAIDs) four weeks prior to enrolment. In all, a total of two hundred and sixty two (262) patients (117 males and 145 females) aged 5.5 to 56 years were found to be eligible for the study. At entry into the study each participant was interviewed to obtain sociodemographic data such as age, sex, level of education and occupation. Stool samples were collected into chemically clean wide mouthed plastic containers for faecal occult blood test and routine stool microscopy. Venous blood were obtained into dry glass test tubes for clotting and retraction to take place, after which samples were centrifugation at 2000g for two minutes and the serum separated for the determination of specific immunoglobulin G (IgG) to Helicobacter pylori.

Faecal occult blood test was done by rapid one-step immunoassay technique for qualitative determination of human haemoglobin in faeces (Occult Blood Brand, CAL-TECH Diagnostics, INC. Chino, California, USA), while routine stool microscopy was done by both direct wet mount and formol concentration techniques for identification of intestinal parasites [$_{21}$]. Helicobacter pylori detection was done by an enzyme-linked immunosorbent assay for the identification of immunoglobulin G [$_{22}$]. All samples were analysed fresh.

STATISTICAL ANALYSIS

Data were analysed for mean, proportion (expressed as percentage), and odd ratio. 95% confidence intervals were calculated where appropriate. Test for statistical significance was done by Chi square at 95% level of significance ($p < 0.05$).

RESULTS

In the 262 patients studied, presenting symptoms include, heartburn [n= 45 (17%)], abdominal pain [n= 68 (26%)], bloating [n= 91 (35%)], vomiting [n= 58 (22%)]. The duration of symptoms ranged 6 months to 2 years (mean = 1.1 years).

Figure 1

Table 1: Age and sex distribution of dyspeptic patients (percentage in parenthesis)

Age groups (years)	Males	Females	Total
≤ 20	17 (36.2)	30 (68.2)	47
21-30	20 (25.6)	58 (74.4)	78
31-40	31 (40.8)	45 (59.2)	76
41-50	44 (81.5)	10 (18.5)	54
> 50	5 (71.4)	2 (28.6)	7
Total	117 (44.7)	145 (55.3)	262

Table 1 shows the age and sex distribution of patients. The patients' ages ranged from 5.5 to 56 years (mean = 38.6 ± 5.2 years) and most were from low socioeconomic background (data not shown). Although females formed greater proportion of the patients, there was no significant sex difference ($p > 0.05$). Majority of the patients presenting with dyspepsia were in the age range 50 years and below.

Figure 2

Table 2: Age and sex distribution of FOB and HP dyspeptic patients (percentage in parenthesis).

Age group(years)	FOB⁺ Male	FOB⁺ Female	FOB⁺ Total	HP⁺ Male	HP⁺ Female	HP⁺ Total	FOB⁺: HP⁺
≤ 20	8 (50)	8 (50)	16	2 (40)	3 (60)	5	3.2: 1
21-30	7 (14.9)	40 (85.1)	47	1 (5.3)	18 (94.7)	19	2.5: 1
31-40	27 (47.4)	30 (52.6)	57	14 (60.9)	9 (39.1)	23	2.5: 1
41-50	32 (84.2)	6 (15.8)	38	15 (93.8)	1 (6.2)	16	2.4: 1
> 50	3 (60)	2 (40)	5	1 (100)	0 (0)	1	5.0: 1
Total	77 (47.2)	86(52.8)	163	33 (47.8)	31 (52.2)	64	3.1 : 1

Legend

FOB⁺ Faecal occult blood positive
HP⁺ Helicobacter pylori positive

A total of 163 (62.2%) patients were positive for faecal occult blood test of which 77 (47.2%) were males and 86 (52.2%) were females, although there was no statistically significant difference (95% CI: -0.184-0.064) between the sexes (table 2). Similarly, there was no significant difference in H. pylori infection between the males and the females [47.8% vs. 52.2%, (95% CI: - 0.184-0.064)], however, majority of the patients positive for both faecal occult blood test and H. pylori test were in the age range 21-50 years (table 2).

Figure 3

Table 3: positivity among FOB and FOB dyspeptic patients

	HP⁺	HP⁻	Total
FOB⁺	64	99	163
FOB⁻	5	94	99
Total	69	193	262

Legend

FOB⁺ Faecal occult blood positive
HP⁺ Helicobacter pylori positive
$X^2 = 26.9$, $p < 0.05$.
Odd ratio 64 x 94/ 99 x 5 = 6016/495 = 12.2

From table 3, the prevalence of H. pylori infection among dyspeptic patients with positive and negative faecal occult blood test was 39.3% (95% CI: 29.2-48.8%) and 5.1% (95%CI: 0.6 – 9.4%) respectively. Dyspeptic patients with positive faecal occult blood test were more likely than were patients with negative results to be anti-H. pylori IgG positive (39.3% vs. 5.1%, Odd ratio = 12.2). Entamoeba histolytica was the major pathogen identified in stool samples of patients (table 4).

Figure 4

Table 4: Comparison of pathogens found in FOB and FOB dyspeptic patients.

Organism	FOB ⁺	FOB ⁻	Total
Entamoeba histolytica	28	27	55
Gardia lamblia	2	2	4
Ancylostoma duodenales	3	2	5
Ascaris lumbricoides	0	1	1
*Candida albicans**	68	30	98
Total	101	62	163

* Significantly different.

Legend

FOB⁺ Faecal occult blood positive
HP⁺ Helicobacter pylori positive

Others are Gardia lamblia, Ancylostoma duodenales (hook worm), Ascaris lumbricoides (round worm) and Candida albicans (yeast cells). The results of faecal occult blood test were not dependent on the presence of parasites in the stool as there was no significant difference in the rate of infection between the FOB $^+$ and FOB $^-$ patients ($X^2 = 9.4$, $p > 0.05$), however, yeast cells were found more in stool samples of FOB $^+$ than in FOB $^-$ patients [68 vs. 30 (95% CI: 0.051-0.329)].

DISCUSSION

Considerable interest exists in the use of non-invasive testing in place of endoscopy in determining the management protocol for patients presenting with upper gastrointestinal symptoms [23]. The use of faecal occult blood test is common among general practitioners in the primary health cares; however, its role in evaluating patients with dyspepsia has not been documented. In the present study, dyspeptic patients with positive faecal occult blood test were more likely than were patients with negative results to be anti-H. pylori IgG positive (39.3% vs. 5.1%, Odd ratio = 12.2). To the best of our knowledge, this report is the first to document an association between H. pylori seropositivity and faecal occult blood test result, and needs to be confirmed in another setting involving larger number of participants. Although no specific investigation was done to assess the integrity of gastric mucosa of our patients, as that was not part of the original design, more gastrointestinal bleeding in H. pylori infected patients than non-infected patients cannot be ruled out. For instance, the prevalence of peptic ulcer has been found to be higher in dyspeptic patients with H. pylori infection than in patients without infection [24]. H. pylori

may induce internal bleeding by production of cytotoxins which weaken gastric mucosa barrier and permits back diffusion of hydrogen ions resulting in tissue damage [25]. Also, H. pylori infection has been associated with reversible lowering of gastric juice ascorbate and may predispose to gastric cancer and peptic ulcerations [26]. The role of H. pylori in GI bleeding has equally been demonstrated in H. pylori , eradication study [27] where H. pylori eradication was found to eliminates further gastrointestinal bleeding in patients who have had bleeding episode with established ulcers. Although specifically for the detection of gastrointestinal (GI) bleeding, faecal occult blood testing may have some implications for dyspeptic patients. For example, despite some side effects such as disruption of lifestyle and anxiety caused by falsely positive screening tests, some benefits have however been associated with faecal occult blood screening [14, 16]. Faecal occult blood screening has been associated with reduction in colorectal cancer, possible reduction in cancer incidence through early detection and removal of colorectal adenomas [17]. However, studies have shown that many diseases such as colon cancer, polyps, colitis diverticulitis and other gastrointestinal problem can cause occult blood in stool [28]. In primary health settings, early detection of internal bleeding through faecal occult blood testing might have important implications for early management decisions when patients first present with dyspepsia. It has been shown that H. pylori infection is a useful predictor of endoscopic diagnosis in patients with dyspepsia and in patients without H. pylori infection, ulcer disease is extremely rare and endoscopic examination is usually normal or shows evidence of oesophagitis [29]. In dyspeptic patients with H. pylori infection, endoscopy shows underlying ulcer disease in 10-50% [30, 31]. Endoscopic finding reported an overall prevalence of peptic ulcer to be 8.5% in adult population and 21% in H. pylori seropositive patients [24]. In the present study, the seroprevalence of H. pylori infection in FOB^+ patients was 39.3%, a lower value than 55% reported by Vaira et al. [24] but higher than that reported by Sobala et. al. [32]. This variation in prevalence of H. pylori in patients with dyspepsia may be attributed partly to differences in socioeconomic status [33]. However, in the present study, not all dyspeptic patients have H. pylori infection, suggesting the involvement of other factors in the aetiology of dyspepsia in this population. For instance, symptoms of dyspepsia have been found in individuals with gastric dysmotility, modified gastric output or altered visceral sensibility, psychological problems, gastroesophageal reflux and irritable bowel [11, 34, 35]. The comparable rate of infection with H. pylori and symptoms of dyspepsia between males and females in the present study corroborates earlier study [2]. Similarly, the presence of more FOB^+ and HP^+ in older patients corroborates the report of Veldhuyzen van Zanten [36] and affirms the age dependent increase in H. pylori infection, a phenomenon that has been attributed to continuous risk of infection [37]. This study also found no significant difference in the rate of infection with intestinal parasites between dyspeptic patients with or without positive faecal occult blood test and/or Helicobacter pylori serology. However, it is interesting to note that although yeast cells are considered normal intestinal flora, its presence in more stool samples from dyspeptic patients with positive faecal occult blood test than samples from patients with negative results (68 vs.30) warrants further studies as the role of yeast cell in the pathogenesis of dyspepsia cannot be ruled out. Infestation with Entamoeba histolytica was also prominent in our patients. Amoebiasis can disrupt the protective mucus layer overlying the colonic mucosa [38]. The resulting epithelial ulcerations can bleed and cause colitis, usually 2-6 weeks after initial infection [38, 39]. Similarly infection with Gardia lamblia, which is stimulated by bile, carbohydrates, and low oxygen tension, can cause dyspepsia, malabsorption, and diarrhoea. A recent theory suggests that the symptoms are the result of brush border enzyme deficiency rather than invasion of the intestinal wall [40]. In conclusion, faecal occult blood test remains an accepted and well-established component of screening patients with intestinal disorders and may be used for the initial evaluation and early management decisions when patients first present with dyspepsia at the first visit to their GPs. However, to avoid overestimation or underestimation of positive faecal occult blood test result and the attendant health implications preliminary findings should be confirmed by other standardised investigations.

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