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BRIEF ARTICLE

Gastroenterology training in a resource-limited setting: Zambia, Southern Africa

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Abstract

AIM: To evaluate need for and efficacy of a structured gastroenterology didactic session in expanding awareness and understanding of digestive disorders.

METHODS: A four-day symposium was developed with didactic sessions (days 1, 2) and practical endoscopy (days 3, 4). Didactic sessions included case presentations highlighting pathophysiology and management. One nurse and four practicing gastroenterologists from the United Kingdom led lectures and supervised workshops with audience participation. Practical endoscopy focused on diagnostic and therapeutic procedures and their application to diagnosis and treatment of ailments of the gastrointestinal tract. Pre- and post-workshop questionnaires were distributed to participants during didactic sessions. A pre-workshop questionnaire gauged expectations and identified objectives to be met at the symposium. Post-workshop questionnaires were administered to assess efficacy of each session. Participants graded sessions from 1 (poor) to 5 (excellent) on quality of case presentations, knowledge, clarity and mode of presentation. We assessed if time allotted to each topic was sufficient, value of sessions, impact on practice and interest in future symposiums.

RESULTS: There were 46 attendees on day 1: 41% undergraduates, 41% residents, 11% consultants and 4% unspecified. Day 2 (a Saturday) had 24 participants: 17% undergraduates, 71% residents, 9% consultants, 4% unspecified. Primary pre-workshop symposium expectation was to gain knowledge in: general gastroenterology (55.5%), practical endoscopy (13.8%), pediatric gastroenterology (5%), epidemiology of gastrointestinal disorders specific to Zambia (6%), and interaction with international speakers (6%). The post-symposium questionnaire was answered by 19 participants, of whom 95% felt specific aims were met; all would attend future conferences and recommend to others.

CONCLUSION: The beneficial effect of a structured symposium in developing countries warrants further attention as a mechanism to improve disease awareness in areas where resources are limited.

Key words: Gastroenterology training; Resource-limited country; Zambia; Specialist training; Postgraduate training; Hepatology

Core tip: The global burden of digestive diseases is increasing, yet formal training in gastroenterology is lacking in traditionally underserved areas such as the African continent. In this study we designed, implemented, and evaluated the effectiveness of a structured 4 d symposium focusing on general topics in the diagnosis and management of digestive disease. This

symposium was geared towards health care professionals and attendees reported improvement in their knowledgebase in gastrointestinal disorders. Structured symposiums are an effective and viable adjunct to medical education and their utility may be highest in regions where traditional academic medical resources are limited.

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INTRODUCTION

Zambia is a Southern African nation with a population of approximately 13 million people[1,2]. The University Teaching Hospital (UTH) in Lusaka has a capacity of approximately 1600 adult and 300 pediatric beds and is the main medical training institution in Zambia. UTH houses an endoscopy unit which serves as both an inpatient and ambulatory care facility providing both emergency and routine endoscopies. The unit is equipped with a Pentax video endoscopy suite which includes gastroscopes (including pediatric scope) and colonoscopes. The unit performs approximately 1000 gastrointestinal endoscopic procedures per year. Instrument cleaning and disinfection follows international guidelines (British Society of Gastroenterology)[3]. Continuing medical education is encouraged as staff regularly attend the South African Gastroenterology conference to maintain up to date proficiency. For a combination of epidemiologic (relatively lower prevalence of biliary disease compared with industrialized nations) and economic (lack of available funding) the unit does not currently carry out endoscopic retrograde cholangiopancreatography. However, there is a significant public health burden of luminal gastrointestinal and hepatology disease, and recent attention has turned to increasing the health care communities' awareness of these disorders[4-7]. Our objective was to develop and host a formal gastrointestinal/hepatology workshop to educate the healthcare sector and also evaluate its place as a mechanism to address the growing interest in this field. We review our experience in the development of the workshop and its impact on the health professionals working in a resource-limited setting.

MATERIALS AND METHODS

We hosted a course to improve understanding of gastrointestinal disorders. The specific aims of the conference were to promote a greater understanding of: (1) the pathophysiology and management of common gastrointestinal/hepatological disorders; (2) principles of endoscopy (upper and lower) including indication, risks and benefits; (3) clinical skills in endoscopy with emphasis on management and evaluation of varices, non-portal hypertensive related gastrointestinal bleeding and colonic polyp recognition and removal; and (4) maintenance of endoscopic efficiency and patient safety.

Lectures

Didactic sessions over the first two days introduced participants to essential pathophysiology and management of prevalent disorders emphasizing a multidisciplinary approach to patient care. The sessions were open to all participants and led by a panel of experts from the United Kingdom in conjunction with staff physicians at UTH. These lectures were focused on pertinent topics including: diarrheal disease, gastrointestinal emergencies, malnutrition, esophageal disease, abdominal pain and hepatology. Sessions were conducted in a case presentation format in which clinical findings and course were reviewed to illustrate key points in pathophysiology and management.

To illustrate, a case of cholera was used as an opportunity to review the physiology of secretory (toxin-mediated) diarrhea, which in turn served as a platform to discuss the rationale of oral rehydration therapy. As another example, a session was centered on gastrointestinal bleeding using cases of peptic ulcer bleeding and variceal bleeding due to schistosomiasis to illustrate principles of emergency management and differing endoscopic approaches to both non-portal hypertensive and portal hypertensive related bleeding. We ran focused hepatology sessions which included cases that fostered discussion on the applicability of gold-standard management with limited resources (for example, availability of vaccinations and access to ultrasound). Guidelines on the management of ascites, hepatitis B and encephalopathy were developed in break-out sessions. On day 2, patients with specific gastrointestinal and hepatology ailments were interviewed in front of the audience to elaborate points for discussion. Audience participation was actively encouraged throughout and sessions were designed to facilitate interaction and comparison of management strategies.

Prior to the workshop, we administered a questionnaire to gauge attendees' expectations and identify weak areas in their knowledge base. Post-workshop questionnaires on the quality of each session asked participants to grade sessions from 1 (poor) to 5 (excellent) on the following criteria: quality of the case presentations, knowledge, clarity and mode of presentation. We also assessed if the time allotted for each topic was considered sufficient, if participants felt presented information was applicable to their stage of training, if they felt there was a need for specific guidelines for the management of presented disorder in Zambia and finally if information learned at the presented session would change their personal management approach.

Practical endoscopy

Our practical sessions complemented lecture-based dis-

Table 1 Demographics of participants *n* (%)

Variables	Preconference	Day 1	Day 2
Gender			
Male		19 (41)	13 (52)
Female		18 (39)	7 (28)
Not stated		9 (20)	5 (20)
Training/specialty			
Undergraduate	17 (47)	19 (41)	4 (17)
Postgraduate	14 (39)	19 (41)	17 (63)
Consultants	4 (11)	5 (11)	4 (9)
Other	1 (3)	3 (7)	1 (4)
Total participants	36	46	24

Table 2 Preconference questionnaire *n* (%)

Expectations	
General GI	20 (56)
Practical endoscopy (adult/children)	5 (14)
Pediatric GI	2 (5)
Epidemiology of GI disorders specific to Zambia	4 (6)
Interaction with international visitors	4 (6)
None	1 (3)
Weak areas	
Hepatology	9 (19)
GI Bleeds (including peptic ulcer disease)	7 (15)
IBD	8 (17)
GI malignancy	4 (8)
Infectious Gastroenterology (including HIV)	6 (13)
Malnutrition	1 (2)
Malabsorption (including celiac)	2 (4)
Diarrheal disease	1 (2)
Fluid management	1 (2)
Autoimmune conditions	1 (2)
Colon pathology	2 (4)
Biliary disease (pancreatic and gallbladder)	1 (2)
Pediatric GI	2 (4)
Practical endoscopy skills	3 (6)

GI: Gastrointestinal; IBD: Inflammatory bowel disease; HIV: Human immunodeficiency virus.

cussion on management in the first two days. Participants were instructed on endoscope instruments and accessories, set-up of endoscopy equipment and preparation for endoscopy including patient safety and informed consent. The nurses were involved in the hands-on experience, and obtained additional training related to the patient preparation, aftercare and maintenance of equipment in the endoscopy unit.

There were 15 participants for the live cases. The first endoscopy day was a combination of adult and pediatric cases: esophageal variceal banding, duodenal polypectomy with hemoclip application for hemostasis and appropriate biopsies in a case of gastric ulcer. The colonoscopies included hematochezia and ulcerative colitis. All cases were followed by a case and management discussion.

RESULTS

Forty-six attendees answered our questionnaires on day 1: 41% undergraduates, 41% residents, 11% consultants and 4% unspecified. Day 2 had 24 participants: 17% undergraduates, 71% residents, 9% consultants, 4% unspecified. Attendees from neighboring countries included 3 physicians from Zimbabwe, 1 from Malawi and 1 from the Democratic Republic of Congo. The organizing committee included five visiting experts in gastroenterology from the United Kingdom, who led several of the didactic sessions. Table 1 describes the demographics.

Primary pre-workshop symposium expectations were to gain knowledge in: general gastroenterology (55.5%), practical endoscopy (13.8%), pediatric gastrointestinal (GI) disorders (5%), epidemiology of GI disorders specific to Zambia (6%), and interaction with international speakers (6%) (Table 2). The most common areas that participants thought their knowledge was weak were: hepatology (19%), inflammatory bowel disease (17%), gastrointestinal bleeds-including peptic ulcer disease (15%) and infectious gastroenterology-including human immunodeficiency virus (HIV) (13%) and gastrointestinal malignancy (8%) (Table 2). Sessions already planned by the time these responses were received covered the majority of these areas.

The sessions were on diarrheal disease, gastrointestinal emergencies, malnutrition, esophageal diseases, abdominal pain and hepatology (Table 3). The cumulative average percentage of respondents who scored sessions either good (4/5) or excellent (5/5) for the following

Table 3 Evaluation of each session *n* (%)

Diarrheal disease	1 (poor)	2	3	4	5 (excellent)
Case presentation	0 (0)	0 (0)	1 (2)	25 (58)	17 (40)
Knowledge	0 (0)	0 (0)	0 (0)	21 (53)	19 (48)
Clarity	0 (0)	0 (0)	7 (18)	16 (41)	16 (41)
Mode of presentation	0 (0)	0 (0)	1 (3)	19 (49)	19 (49)
GI emergencies					
Case presentation	0 (0)	1 (3)	2 (6)	20 (59)	11 (32)
Knowledge	0 (0)	0 (0)	2 (6)	21 (62)	11 (32)
Clarity	0 (0)	0 (0)	4 (11)	17 (47)	15 (42)
Mode of presentation	0 (0)	0 (0)	1 (3)	19 (51)	16 (43)
Malnutrition					
Case presentation	0 (0)	0 (0)	1 (3)	29 (73)	10 (29)
Knowledge	0 (0)	0 (0)	1 (3)	22 (55)	17 (43)
Clarity	0 (0)	0 (0)	3 (8)	11 (64)	11 (28)
Mode of presentation	0 (0)	0 (0)	2 (5)	24 (60)	14 (35)
Oesophageal diseases					
Case presentation	0 (0)	0 (0)	0 (0)	6 (30)	14 (70)
Knowledge	0 (0)	0 (0)	0 (0)	9 (45)	11 (55)
Clarity	0 (0)	0 (0)	0 (0)	11 (55)	9 (45)
Mode of presentation	0 (0)	0 (0)	0 (0)	9 (45)	11 (55)
Abdominal pain					
Case presentation	0 (0)	0 (0)	0 (0)	6 (30)	14 (70)
Knowledge	0 (0)	0 (0)	1 (5)	5 (25)	14 (70)
Clarity	0 (0)	0 (0)	1 (5)	4 (20)	15 (75)
Mode of presentation	0 (0)	0 (0)	0 (0)	5 (25)	15 (75)
Hepatology					
Case presentation	0 (0)	0 (0)	1 (5)	7 (33)	13 (62)
Knowledge	0 (0)	0 (0)	2 (10)	7 (33)	12 (57)
Clarity	0 (0)	0 (0)	1 (3)	12 (57)	8 (38)
Mode of presentation	0 (0)	0 (0)	1 (5)	7 (33)	13 (62)

Participants graded sessions from 1 (poor) to 5 (excellent) on quality of case presentations, knowledge, clarity and mode of presentation.

criteria: case presentation 97%, knowledge 96%, clarity 93%, mode of presentation 97%. The percentage of respondents who answered "Yes" to the following questions on each topic: was time allotted to this topic sufficient? 81%; did you find this session valuable for your stage of training? 98%; do we need to develop specific management guidelines? 95%; will this session change your management? 94%.

There were some variations between sessions although the overall quality was considered high. Significant numbers of respondents said that the time allocated was insufficient for diarrhoeal disease (33%), malnutrition (24%) and esophageal disease (25%). This demonstrates an interest and need for further training in these areas. The large majority (95%) who felt specific management guidelines should be developed on these topics is also indicative of the need for further work. The post-symposium questionnaire was answered by 19 participants, of whom 95% felt specific aims were met; 90% would pay for future conferences, all would attend future conferences and recommend to others.

DISCUSSION

There is a recognized shortage of general and specialized medical doctors in Zambia and Sub-Saharan African countries[8-10]. The detailed reasons for such shortages are beyond the scope for this paper, however one of the identified strategies to curtail this problem includes training opportunities and continued medical education[9,10]. Based on 2010 statistics, the health life expectancy at birth in Zambia is 49 years[11]. The dominant gastrointestinal and hepatological clinical problems are variceal bleeding due to schistosomiasis, esophageal strictures due to caustic substance ingestion, infectious diarrhea (often HIV related), peptic ulceration, hepatitis B, and gastrointestinal cancer (Kaposi sarcoma, esophageal, gastric and colon cancer)[12,13]. There is also a considerable burden of neurogastroenterological problems including achalasia, functional dyspepsia and irritable bowel syndrome. The most common cause of esophageal bleeding in patients presenting to our endoscopy unit is esophageal varices (25%), other etiologies are duodenal ulcer (17%) and gastric ulcers (21%); less frequent but significant causes are Kaposi's sarcoma (2%) and Mallory Weiss tear (1%)[12]. It has been estimated that more than 90% of schistosomiasis cases occur within Sub-Saharan Africa[14]. The prevalence in Zambia is 77% and the two predominant forms are *Schistosoma hematobium* and *Schistosoma mansoni*[15,16]. *Schistosoma mansoni* has been implicated in intestinal and liver disarray resulting in portal hypertension, esophageal varices, gastrointestinal bleed and rarely liver failure[17-19].

The estimated prevalence of HIV infection in Zambian adults aged 15-49 years is estimated between 10.3%-19.7%, leading to an increased burden of HIV enteropathy[20,21]. With this HIV burden there is also concern for the increasing trend of hepatitis B and hepatitis C[22]. There are no Zambian liver disease management guidelines, thus current practice follows guidelines of the World Health Organization[23], American Association for the Study of Liver disease[24] and European Society for the Study of Liver[25], which are not suitable in resource-limited settings and in an area where etiopathogenesis is different.

The incidence of gastric and esophageal cancer in adults younger than 45 years is higher than in United States or United Kingdom[12]. Gastric cancer in patients under 45 years accounts for 33% of cases, whilst esophageal cancer represented 16% of endoscopically diagnosed cases[12]. Survival from digestive disease is lower in developing countries, in those within the African continent[26], thus raising awareness and developing prevention programs are important and can be enhanced through educational symposia such as described in this paper. Caustic injuries, either suicidal or accidental, are another area of concern; with patients presenting late in the course with resultant gastric outlet obstruction (55%), esophageal strictures (30%), gastric ulcerations (21%)[27].

One of the aims of the workshop was to draw in other health care workers interested in gastroenterology and hepatology but working outside UTH so as to facilitate networking and optimize standards of care for GI diseases throughout the country, and positively impact the African continent. We successfully included physicians from neighbouring countries: 3 from Zimbabwe, 1 Malawi, 1 Congo. These surrounding nations benefited from this course because they share a similar disease burden as Zambia. Continued training in the field of gastroenterology in Zambia and other resource-limited areas, is necessary to enhance understanding of pathophysiology and management, thus improving overall patient care.

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COMMENTS

Background

Formal training in gastroenterology is lacking despite the huge burden of digestive disease across Africa. Given the disparity in the supply of formally-trained gastroenterologists and the ever increasing demand of citizens, the authors organized a structured four-day symposium focusing on gastrointestinal/hepatological case based presentations and introduction to endoscopy.

Research frontiers

Promotion of such educational activities should be encouraged not only to help physicians develop new perspectives on disease, but also to improve overall patient care.

Innovations and breakthroughs

In this work the authors organized the first gastroenterology symposium in Zambia, attracting students and physicians from neighbouring countries. The authors have set a foundation for similar activities in the future.

Applications

This could be replicated in other developing countries that face similar disease burdens and require improvements in undergraduate and postgraduate training.

Terminology

The symposium was an opportunity to teach, increase awareness of gastroin-

testinal and hepatological diseases whilst creating an environment for networking. This symposium addressed current knowledge and recent advances in gastrointestinal/hepatological disease.

Peer review

This article provides information and guidelines for setting up a structured symposium in a resource-limited setting. Equally important, this highlights the need for structured clinical gastroenterology/hepatology training programmes with adequate curricula that emphasize knowledge, skills, and scientific productivity.

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