Ulcerative Colitis in the Tropics

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Ulcerative colitis as a separate entity was first described by Wilks and Moxan (1875). Idiopathic ulcerative colitis has been defined as an acute and chronic inflammatory and ulcerative disease of the rectum and colon of unknown aetiology (Kirsner, 1959). Many reports on various aspects of the disease have appeared in the Western literature (Bargen, 1930; Felsen and Gorenberg, 1936; Palmer, 1948; Kirsner *et al.*, 1957; Kirsner and Goldgraber, 1960; Edwards and Truelove, 1963, 1964).

However, there has been very little documented evidence of this disease from tropical countries, and it is thought to be essentially a disease of temperate zones (Melrose, 1955). Almost 30 years ago Chopra and Ray (1939), from the School of Tropical Medicine, Calcutta, reported 120 cases of nonspecific ulcerative colitis. The clinical description and investigations leave little doubt that these were cases of this disease, as specific infections were effectively excluded. It is surprising that this report has gone unnoticed in the subsequent literature, and the impression has continued to persist that nonspecific ulcerative colitis is rare in the tropics. There were three important reasons why nonspecific ulcerative colitis was not often diagnosed: lack of facilities for precise diagnosis of dysenteric disorders; scarcity of antibacterial drugs by which a therapeutic test could be used to distinguish between recurrent specific infections and ulcerative colitis; and lack of the long-term observation of patients which is of such great help in making a diagnosis of this condition. This situation is gradually becoming corrected, and reports on nonspecific ulcerative colitis in the tropics have appeared in recent years (Pasricha *et al.*, 1958; Tandon *et al.*, 1965).

The present study had a threefold objective—namely, to assess the magnitude of the disease in this region, to compare the pattern with that reported in the West, and to emphasize the difficulties associated with the diagnosis of nonspecific ulcerative colitis due to the high prevalence of specific infections of the colon in the tropics.

Material and Methods

(1) A questionary was sent to the leading hospitals in different parts of the country for information regarding admission of cases of nonspecific ulcerative colitis during the period 1956–60. The inquiry covered the total number of admissions each year, the number of yearly medical admissions, and the number of ulcerative colitis cases admitted annually. The information received was analysed.

(2) Forty-six patients with ulcerative colitis were studied in detail. The diagnosis of ulcerative colitis was made on the basis of a clinical history of chronic dysentery not responding to adequate specific therapy, nonisolation of bacterial, protozoal, and helminthic pathogens on repeated smear and culture examinations, and on sigmoidoscopic, radiological, and histological evidence of the disease.

(3) Three fresh stool specimens and a rectal swab taken during sigmoidoscopy were examined by means of saline and iodine preparations to exclude amoebic infection. Stool cultures for pathogenic bacteria were done on three consecutive days by a standard technique.

(4) The sigmoidoscopic findings were graded according to the classification of Matts (1961). Normal was taken as grade 1; mild granularity of the mucosa with mild contact bleeding as grade 2; marked granularity with oedema of mucosa, marked fragility with contact, and spontaneous bleeding as grade 3; and severe ulcerations of the mucosa with haemorrhage and/or pseudopolyposis as grade 4.

(5) The histological changes in the colonic biopsy were also graded (Matts, 1961): normal as grade 1; some infiltration of the mucosa, or lamina propria, with either round cells or polymorphs as grade 2; marked cellular infiltration of the lamina propria and submucosa as grade 3; the presence of crypt abscesses with marked infiltration of all the layers of the mucosa as grade 4; and ulceration, erosion, and necrosis of the mucosa with cellular infiltration of some or all of its layers as grade 5.

(6) Barium-enema examination was done in 38 patients. The extent of the disease was analysed and alterations in the radiological patterns of the colon were recorded.

Results

Admission Rate.—Information obtained from different hospitals in various cities of the country was analysed (Table I). It was observed that the admission rate in different hospitals varied from 3.6 to 26.1 cases per 10,000 hospital admissions. For medical cases alone the rate varied from 8.3 to 89.1 per 10,000 admissions. The overall admission rate came to 28.3 cases per 10,000 medical admissions and 9.4 cases per 10,000 total hospital admissions.

TABLE I.—*Admission rate of Ulcerative Colitis in Various Hospitals*

Name of City	Average No. of Cases per Year	Average Admissions per Year		Rate per 10,000 Admissions	
		Medical	Total	Medical Wards	Whole Hospital
(1) Calcutta ..	11·5	1,295	—	89·1	—
(2) Bombay ..	73	9,949	27,933	73·35	26·13
(3) New Delhi ..	48	17,079	57,810	41·5	10·44
(4) Amritsar ..	17	3,013	23,034	56·42	7·38
(5) Vellore ..	10·5	3,066	13,565	34·26	7·74
(6) Madras ..	16·5	18,744	37,118	8·8	4·44
(7) Gwalior ..	2·5	2,866	—	8·37	—
(8) Ahmedabad	8·55	10,241	23,358	8·3	3·65
Total ..	187·5	66,253	182,818	28·3	9·4

Clinical Profile.—About three-quarters of the cases were in the third and fourth decades, though the disease was seen in all age groups. The paediatric age group was not included in the study (Table II). The mean age at onset was 31.5 years for men and 25.3 years for women. The minimum age at onset was 9 years and the maximum age 56 years. Males were affected more often than females, the ratio being 2.3 : 1. The average duration of symptoms previous to the first examination was 3.2

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years. The majority of patients came with symptoms of less than four years' standing. Most of the cases occurred in poor socio-economic groups. A family history of the disease was present in one case. Various factors incriminated by patients as precipitating an attack of the disease or aggravating the symptoms were milk in five cases, emotional disturbances in five, pregnancy in one, and respiratory infection in one. The symptoms and physical signs of these patients were carefully recorded and analysed (Table III). Loose motions with blood and mucus were the presenting symptoms in all cases. Abdominal pain and flatulence were present in most of the patients. General symptoms of the disease were less marked. On the basis of symptomatology (Truelove, 1956) 12 cases were graded as severe, 18 as moderate, and 16 as mild.

TABLE II.—*Age and Sex Distribution*

Age Group	Total Cases	Male	Female
12–20 years	6	2	4
21–30 „	8	8	—
31–40 „	24	16	8
41–50 „	5	4	1
51–60 „	2	1	1
61+ „	1	1	—
Total	46	32	14

TABLE III.—*Clinical Features of Ulcerative Colitis*

Symptoms	No. of Cases	Physical Signs	No. of Cases
Loose motions with blood and mucus	46	Abdominal tenderness ..	38
Frequency of stools ..	46	Pallor	26
Flatulence	36	Palpable liver	10
Pain abdomen (diffuse) ..	35	Hypovitaminosis B ..	10
Tenesmus	15	Oedema	7
Loss of weight	15	Clubbing	2
Fever	13	Palpable spleen	1
Anorexia	7		
Arthralgia	6		
Vomiting	3		
Rectal itching	3		

Complications.—Local complications were common. Pseudopolyposis (Fig. 1) was observed in seven, severe haemorrhage in two, perforation in one, pararectal abscess in one, fissure-in-ano in one, and haemorrhoids in four cases. Systemic complications were encountered in only two patients, who suffered from thrombophlebitis and arthritis respectively. The arthritis involved metatarsophalangeal, hip, knee, and ankle joints. The Rose–Waaler test was negative and the serum uric acid level was normal in this case. Four patients died during the period of study, one from perforation, one from uncontrolled haemorrhage, one during the postoperative period after resection of the colon and ileostomy, and the fourth from fulminating disease not responding to treatment.

Sigmoidoscopic Findings.—On sigmoidoscopic examination all cases had varying degrees of abnormality. Ten patients had severe or grade 4 changes, 20 moderate or grade 3, and 16 mild or grade 2 (Matts, 1961). Pseudopolyposis was seen in three cases with severe changes.

Histological Findings.—Colonic mucosal biopsy was done in 32 cases. Severe changes (grades 4 and 5) were observed in 13 cases, moderate changes (grade 3) in 11, and mild (grade 2) changes in eight. No patient had normal (grade 1) biopsy. Cryptitis and crypt abscesses were seen in 13 cases (Fig. 2).

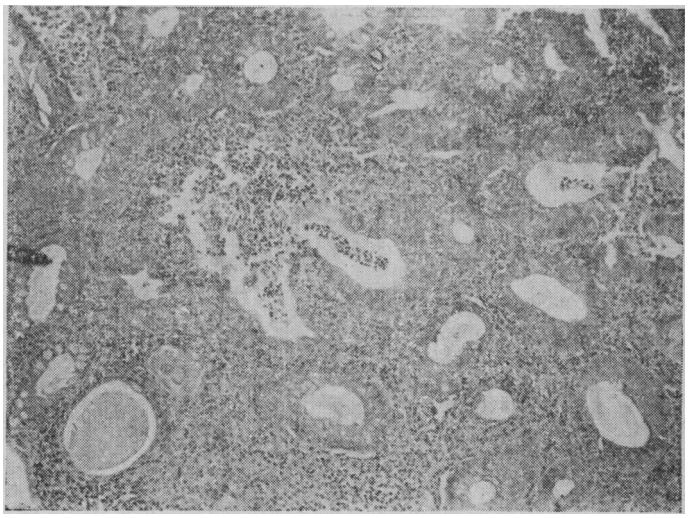

FIG. 2.—Rectal mucosa showing glandular hyperplasia with heavy mononuclear infiltration in the lamina propria and crypt abscess.

Radiological Findings.—Barium enema was done in 38 patients (Fig. 3). Irritability of the colon, oedema, and loss of haustration were the early and most important radiological findings in the majority of the cases. Radiological evidence of gross ulceration was seen in 11, narrowing of the lumen in 10, lead-pipe deformity in six, pseudopolyposis in six, and dilatation of the lumen of the bowel in four. The extent of the disease as seen by barium enema was analysed (Table IV). In

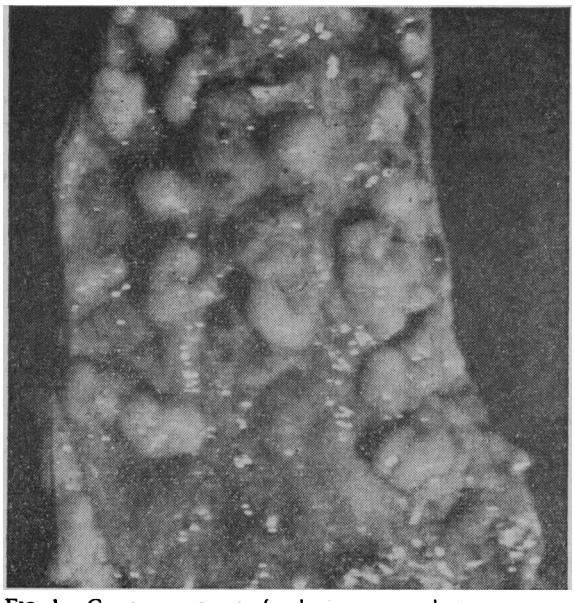

FIG. 1.—Gross appearance of colonic mucosa showing extensive ulceration and a number of pseudopolypi (resected specimen).

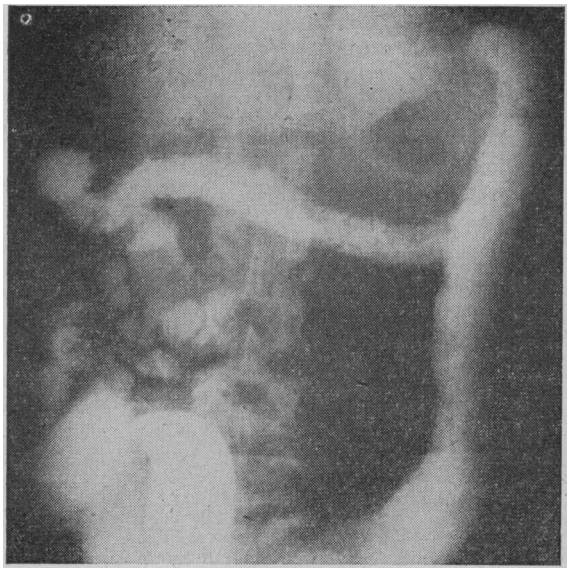

FIG. 3.—Representative radiological finding in a patient with extensive ulcerative colitis showing ragged serrations, pseudopolyposis, and narrowing of the lumen of the descending colon.

about half the cases the disease extended from the rectum to the splenic flexure. Six patients had normal radiological appearances. The disease in these cases was limited to the rectum and rectosigmoid regions only.

TABLE IV.—*Extent of Disease on Barium Enema Examination in 38 Cases*

Normal colon	6
Rectum to sigmoid	4
„ „ splenic flexure	21
„ „ mid-transverse colon	3
„ „ hepatic flexure	2
Entire colon	2

Discussion

The information obtained from the leading hospitals in different parts of the country revealed marked variations in the admission rate of cases of ulcerative colitis. From these figures (Table I) it would be wrong to assume that there is such an extreme variation in the prevalence of this disease. These differences are likely to be due to variations in the type of patient visiting the hospital, in the degree of interest that the attending physicians have in the disease, in the facilities available for diagnosis, and in the criteria employed for the diagnosis of ulcerative colitis. As these were not uniform it is not possible to draw any firm conclusion about the relative frequency of the disease and the factors responsible for regional differences. For this, one would need a planned prospective study.

Similar observations made in Britain (Melrose, 1955) revealed a frequency varying from 2 to 20 per 10,000 hospital admissions in different regions. Hospitals in Scotland had lower figures than those in England. The overall admission rate for ulcerative colitis from our data is 9.4 cases per 10,000 hospital admissions. This is not very different from the reported admission rate of 10 cases per 10,000 hospital admissions in the United Kingdom. Comparable figures for U.S.A. are 50–100, for Switzerland six, for New Zealand 0.55, and for Norway 5 per 10,000 admissions (Bebchuk *et al.*, 1961). One can safely conclude that ulcerative colitis is not a rare disease in tropical regions of India. Therefore early differentiation of cases of ulcerative colitis from specific dysenteries in the tropics is of importance in view of its high mortality and morbidity compared with what occurs in the specific dysenteries (Craig, 1947).

There was no significant difference in the age distribution and duration of symptoms when compared with Western reports (Bacon, 1958 ; Sloan *et al.*, 1950 ; Edwards and Truelove, 1963, 1964). Males were affected more often than females, while in Western series they are either equal or the females predominate (Sloan *et al.*, 1950 ; Edwards and Truelove, 1963, 1964). The smaller number of females in this series may be partly due to the fact that the number of women admitted to hospital is much lower than that of men.

Complications of ulcerative colitis may either be local in and around the large bowel or be systemic, affecting distant parts of the body. In all, complications were encountered in 12 cases (26%). This figure is on the low side compared with the Western reports of 31 to 40% (Rankin *et al.*, 1932 ; Ricketts and Palmer, 1946 ; Dennis and Karlson, 1952). Except for one case of arthritis and one case of thrombophlebitis, systemic complications were conspicuously absent. Sloan *et al.* (1950) and Edwards and Truelove (1964) recorded arthritis in 7.7 and 5.6% cases respectively in their series. In the present series there was no case of erythema nodosum, pyodermia gangrenosum and other skin rashes, eye lesions, ankylosing spondylitis, oral moniliasis, hepatitis, pulmonary embolism, or renal complications. Local complications such as pseudopolyposis, massive haemorrhage, perforation, pararectal abscess, and anal fissure were also found less frequently in this study than in Western surveys (Sloan *et al.*, 1950 ; Edwards and Truelove, 1964). Acute dilatation of the colon, fibrous strictures, fistulae, and carcinoma of the colon were not encountered. Sloan *et al.* (1950) observed fibrous strictures in 11.1% of cases, perianal and perirectal infections and fistulae in 6%, and carcinoma of the colon in 5.4%. Edwards and Truelove (1964) reported figures of 6.3%, 7.7%, 3.5%, and 1.6% for fibrous strictures, fistulae, carcinoma, and acute dilatation of the colon, respectively.

Severe abnormalities on sigmoidoscopy were found in 10 out of 46 cases. In the remaining 36 the changes were mild to moderate. Matts (1961) observed severe or grade 4 changes in 46 (36.5%) of his series of 126 patients of ulcerative colitis. Rectal biopsy showed histological abnormalities of varying grades in all cases. Severe changes (grade 5 and 4) were seen in 13 cases (40.6%). Matts (1961) reported severe changes in 50% of rectal biopsies in cases of ulcerative colitis.

On radiological examination the disease was less extensive and more often confined to the rectum, sigmoid, and descending colon. The entire colon was involved in only two cases. There was no case of backwash ileitis. Ricketts *et al.* (1948) reported extensive disease involving the whole of the colon, with or without backwash ileitis, in 30% of cases.

Thus ulcerative colitis as seen in this region appears to be a milder disease with fewer complications and less severe sigmoidoscopic and histological changes. Why the disease is milder with limited involvement of colon than that seen in the West is not apparent. Is it that the repeated infections made the colon less prone to nonspecific ulcerative colitis or is it that this is a disease of the sophisticated and our population has not reached a comparable degree of sophistication with resulting psychological stresses ? Psychological stresses are thought to have a bearing on the causation of the disease (Finch and Hess, 1962 ; Fullerton *et al.*, 1962 ; Daniels *et al.*, 1962).

The diagnosis of ulcerative colitis in the tropics is more difficult than in Western countries because of the high prevalence of amoebic and bacillary dysenteries. In addition, diffuse colonic tuberculosis and lymphogranuloma venereum also create difficulty in diagnosis, because the clinical picture of chronic nonspecific ulcerative colitis is sometimes virtually indistinguishable from those conditions. Fortunately, diffuse colonic tuberculosis is rare (Glenn and Read, 1946 ; McColl, 1956 ; Virmani, 1963) and lymphogranuloma is present in only isolated areas.

Sigmoidoscopic and radiological appearances similar to those seen in ulcerative colitis have been observed in cases of proved bacillary and amoebic infections (Manson-Bahr, 1943). Cryptitis and crypt abscesses on rectal biopsy have also been seen in cases of specific dysenteries, though much less frequently. Microbiological and parasitological study may not reveal the pathogens in many cases of specific infections, especially when patients have received some antimicrobial agents before investigation. Powell and Wilmont (1966) have raised the interesting problem of ulcerative post-dysenteric colitis resulting from amoebiasis. Whether this condition is a separate entity or whether amoebic infection is associated with nonspecific ulcerative colitis is not apparent. Further study and follow-up are required to clarify this situation. There is thus distinct difficulty in the differential diagnosis of ulcerative colitis and specific infections of the colon in the tropics, and often one has to depend on therapeutic tests to exclude the latter. It has therefore been a routine in some centres, even when repeated examinations have failed to demonstrate pathogens in the stools, to give adequate antibacterial and antiamoebic therapy in every case of the chronic dysenteric syndrome before diagnosing the case as idiopathic nonspecific ulcerative colitis.

Summary

A survey of the medical records of leading hospitals in different parts of India for the period 1955–60 revealed that ulcerative colitis is not rare in this part of the world. The admission rate in different hospitals varied from 8.3 to 89.1 cases per 10,000 hospital admissions.

Forty-six cases of ulcerative colitis were studied in detail. By comparison with Western series, ulcerative colitis as seen in this region is a milder disease with fewer complications and with less severe changes on sigmoidoscopy and rectal biopsy. The disease remains limited to the rectum, sigmoid colon, and descending colon in the majority of cases.

Owing to the high prevalence of specific infections of the colon there are difficulties associated with the diagnosis of ulcerative colitis, and these are discussed.

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Electroencephalogram and Retinal Vessels in Congenital Cyanotic Heart Disease Before and After Surgery

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The electroencephalogram (E.E.G.) is often abnormal in patients with congenital cyanotic heart disease (Shev and Robinson, 1958; Lesny *et al.*, 1960; Fowler *et al.*, 1962; Allen *et al.*, 1967). The reason for this is unknown. The disturbance of cerebral function might be due to structural brain disease, which is commonly present (Cohen, 1960), to chronic arterial desaturation, or to decreased cerebral blood flow resulting from a high packed cell volume (P.C.V.). Many of these patients also have abnormal fundi for which the polycythaemia has been incriminated (Taussig, 1960).

We have recently had the opportunity to study the retinal and E.E.G. changes in 12 patients with congenital cyanotic heart disease both before and at various intervals after operative treatment of their cardiac defects. The data obtained may throw some light on the cause of the abnormal E.E.G.s seen in these cases.

Angiographic study of the cerebral circulation in these patients is dangerous because of their known liability to cerebral thrombosis. The retinal vessels, however, are readily accessible for repeated examination, and their response to cardiac surgery may give some indication of what is happening at the level of the cerebral vasculature.

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Patients and Methods

Clinical and operative details concerning the 12 patients are given in Table I.

E.E.G. Studies.—All 12 patients had preoperative records. All except two (Cases 8 and 9) were again studied two weeks

TABLE I.—*Clinical Details of 12 Patients with Cyanotic Congenital Heart Disease*

Case No.	Diagnosis	Age*	Sex	Previous Surgery	Present Surgery
1	Transposition. PS, VSD, PDA	23	F	—	Brock's procedure (C)
2	Fallot's tetralogy	6	M	—	" "
3	PS and ASD	9	F	Brock's procedure aged 8 (C)	Closure of ASD (O)
4	PS and ASD	44	F	—	Brock's procedure (C)
5	Fallot's tetralogy	12	F	Blalock anastomosis aged 5 (C)	Total correction (O)
6	" "	8	F	—	" " "
7	Transposition. PS, VSD	11	M	Blalock anastomosis aged 3 (C)	Blalock-Hanlon (C)
8	Fallot's tetralogy	17	F	Blalock anastomosis aged 13 (C)	Brock's procedure (C)
9	" "	7	M	—	Total correction (O)
10	Transposition. Pulmonary atresia. VSD	12	F	—	Blalock anastomosis (C)
11	Fallot's tetralogy	5	M	—	Brock's procedure (C)
12	" "	14	M	Blalock anastomosis aged 2 (C)	Total correction (O)

* At time of surgery.
PS = Pulmonary stenosis. VSD = Ventricular septal defect. PDA = Patent ductus arteriosus. ASD = Atrial septal defect. C = Closed surgical procedure. O = Open procedure involving total body perfusion.