Motility of the pelvic colon

Part III Motility responses in patients with symptoms following amoebic dysentery¹

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EDITORIAL SYNOPSIS Post-dysenteric irritability of the bowel is a well-known clinical entity. This paper is a joint British and Egyptian study of a group of patients with this condition, the work being carried out in Cairo. The motility response of the post-amoebic group to prostigmine was greater than in a control group but the basal motility and the response to the physiological stimuli and to change of posture were the same.

It is commonly recognized that following on an attack of amoebic colitis in which vegetative forms of *Entamoeba histolytica* are isolated, a patient may for many years suffer from constant or intermittent irregularity of bowel habit although repeated stool examination may fail to reveal any vegetative forms of the parasite. This condition of altered bowel habit, sometimes accompanied by abdominal pain, has been variously described as chronic dysentery, post-dysenteric colitis, or post-dysenteric irritable bowel. As there are no definite diagnostic signs, either clinically or on laboratory investigation, the condition is ill defined and there is considerable doubt about its pedigree. This paper presents a study of the motility of the pelvic colon of a series of patients who might be classified in this way and compares it with that of a series of control patients taken from the same population. The object of the study was to determine if patients who had bowel symptoms following amoebic dysentery differed from normals in regard to their basal motility or to motility stimulated by physiological and pharmacological means.

SUBJECTS

Altogether 42 subjects were studied. Twenty-six, in the past, had been shown to have vegetative

forms of *Entamoeba histolytica* in the stool during a dysenteric illness. Following treatment with emetine they had recovered clinically and all vegetative forms had disappeared from the stool. Subsequently, however, they had been subject to intermittent attacks of bowel dysfunction usually associated with abdominal pain and discomfort. The following case histories are typical of this type of case.

ILLUSTRATIVE CASE 1 The patient was a student of the Faculty of Commerce of Cairo University, aged 25 years. He had proven amoebic dysentery on two occasions when he was aged 13 and 18 years respectively. On both occasions vegetative forms of *Entamoeba histolytica* had been isolated from the stool. Following the second attack his bowel habit had been persistently irregular, alternating between periods of moderately severe constipation and explosive diarrhoea. From time to time he had bouts of abdominal distension after eating lasting from 30 minutes to one hour.

Physical examination revealed no abnormality and a barium enema was normal. On sigmoidoscopy the colonic mucosa was seen to be reddened and bled easily to touch. The vascular pattern was seen although the general appearance was slightly granular.

ILLUSTRATIVE CASE 2 This patient was a bus conductor, aged 35 years. He had acute amoebic dysentery 15 months before the time of study. Following intensive therapy with emetine he became free of symptoms for two months. Subsequently, however, he developed diarrhoea which was initially only after eating but which latterly had become more constant. He passed no blood but frequently passed an excess of mucus in the stool. When the diarrhoea was severe it was associated with generalized abdominal

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colic. There were remissions of up to one week when he was free of diarrhoea and pain.

Physical examination was negative and sigmoidoscopy revealed a red shiny mucosa which was slightly oedematous and bled easily to touch. There was an excess of mucus. Examination of the stool at the time of study was negative but cysts of *Entamoeba histolytica* had been noted one month previously. No vegetative forms had been seen since the acute attack.

The criteria for inclusion in the post dysenteric group were. 1 A proven attack of amoebic dysentery in the past during which vegetative forms had been seen. 2 The persistence, either continuously or intermittently, of an abnormality of bowel habit which might be associated with epigastric discomfort or pain. 3 The absence of vegetative forms of amoebae after treatment, although cysts might be present.

In these patients the sigmoidoscopic appearances were usually distinctive. The mucosa was reddened and bled easily to touch, although spontaneous bleeding was never seen. In a proportion of cases there was an excess of mucus. The vascular pattern was normally visible, but on occasion the surface presented a fine granularity.

The control series comprised patients who were not known to have had at any time amoebic dysentery and who did not have any symptoms referable to the large bowel. Sigmoidoscopy was normal but the majority of these patients, as is usual in Egypt, passed cysts of *Entamoeba histolytica*. Table I gives details of the control series.

TABLE I

CLINICAL DETAILS OF CONTROL SERIES

No.	Age	Sex	Diagnosis
1	32	M	Bronchitis
2	19	M	Keloid scar
3	35	F	Neurosis
4	39	M	Chronic bronchitis
5	39	M	Rheumatoid arthritis
6	19	M	Rheumatic heart disease
7	31	M	Dyspepsia
8	22	M	Dyspepsia
9	22	M	Rheumatic heart disease
10	18	M	Rheumatic heart disease
11	19	M	Peripheral neuritis? leprosy
12	25	M	Chronic bronchitis
13	32	M	Pellagrous neuritis
14	55	M	Byssinosis
15	20	M	Dyspepsia
16	25	M	Arthritis

METHODS

The motility of the pelvic colon was studied using miniature balloons and a metal capsule optical manometer (Rowlands, Honour, Edwards, and Corbett, 1953). The recording tube was passed through the sigmoidoscope and the recording balloons placed routinely at

25, 20, and 15 cm. from the anus. The method of recording and analysis of the records has been described fully elsewhere (Connell, 1961). As far as possible the following routine was carried out in each case.

After allowing a period of at least 30 minutes to elapse after sigmoidoscopy the basal motility was recorded for at least 30 minutes with the patient supine.

The patient sat up and motility was recorded for 10 minutes in this position.

After another period during which the patient was supine he was shown his lunch and subsequently ate it. Motility was recorded during this time and for a period of 30 minutes after he had finished his lunch.

An injection of prostigmine, 0.75 mg. subcutaneously, was given and motility recorded in the half-hour period commencing 30 minutes after the injection.

For practical reasons it was not always possible to complete the total programme in any one patient, and of the 26 patients with symptoms, 18 had lunch and 19 had prostigmine. Of the 16 control patients, 13 had lunch and eight prostigmine.

All records were inspected in their entirety but in each case three periods were selected for detailed analysis. These were the 30-minute resting motility immediately preceding the change in posture; the 30 minutes immediately following the end of lunch; the 30 minutes beginning 30 minutes after injection of prostigmine.

The records were analysed with regard to the duration of activity, the mean amplitude of the waves, and the total activity present.

RESULTS

The general appearances (Fig. 1) of the traces obtained both in the dysenteric group and the control group were similar to those obtained in normal persons in Great Britain (Connell, 1961). Principal waves at approximately 2 per minute occurring apparently independently in different channels were the main feature of the records. There was, however, a tendency for less activity to be present than in the British series. Table II sets out the motility of the lower sigmoid, the rectosigmoid area, and the upper rectum of all the patients with post-dysenteric colitis. The general effect of lunch and the administration of prostigmine can also be seen in Table II. It will be seen that the effect of a meal is to increase the activity in the sigmoid but not in the upper rectum. Prostigmine results in a marked increase in activity at all three areas.

Table II also sets out similar data for the control group. The figures in brackets are equivalent data from British subjects (Connell, 1961). The basal motility is essentially the same in the post-amoebic group and the control group although the activity of the rectum is greater in the amoebic group than in the control group. This difference, however, might have arisen by chance. The basal motility in the Egyptian series is less than in the British series.

FIG. 1. Typical trace in both groups showing similarity to those obtained in normal persons in Great Britain.

Again, however, this difference could have occurred by chance.

EFFECT OF LUNCH Table II indicates that the increase of activity following eating was approximately the same for the dysenteric group as for the control group. However, as not all patients were given a meal, Table III isolates those patients who had lunch and sets out its effect on the sigmoid colon by comparing the basal and post-prandial periods of the patients who were given lunch. The

effect of lunch is the same in both the post-dysenteric and control groups, the resulting increase in motility being the same. As a rule patients were shown lunch and allowed to see it for five minutes before eating. No effect was noted in any case. This may be related to the unappetizing nature of the meal which usually consisted of a piece of cold boiled mutton and a large quantity of rice together with wheaten bread.

Five of the patients with post-amoebic conditions complained of symptoms in the post-prandial

TABLE II
MOTILITY OF THE PELVIC COLON IN PATIENTS WITH POST-DYSENTERIC SYMPTOMS

	No.	Basal			Lunch				Prostigmine			
		Duration of Activity	Mean Activity	Prod	No.	Duration of Activity	Mean Activity	Prod	No.	Duration of Activity	Mean Activity	Prod
Amoebics												
25 cm.	25	39.2	8.6	354.6	15	56.7	11.7	624.5	18	74.8	17.1	1358
	±	25.9	4.1	287.2		25.9	5.5	324		19.7	8.5	954.8
20 cm.	23	36.3	7.1	280.3	16	54.9	8.9	485.4	14	75.2	12.3	9.041
	±	25.5	2.6	231.1		25.1	3.9	259.3		25.2	6.0	498.0
15 cm.	26	42.1	6.1	287.8	16	44.1	6.8	315.1	19	64.5	8.9	664.8
	±	26.2	2.3	280.4		24.4	2.3	197.3		33.6	4.4	532.1
Normals												
25 m.	16	37.6 (51.4)	8.6 (11.5)	336 (640)	13	52.3	12.0	637	7	47.6	13.3	748
	±	18.4	3.7	206		17.4	1.9	432		19.8	7.3	629
20 m.	14	30.4 (50.2)	6.6 (11.7)	235 (619)	12	55.6	9.7	544	7	54.3	7.8	617
	±	18.8	2.9	211		30.1	2.0	353		23.9	5.8	539.1
15 m.	15	23.7 (60.7)	5.4 (7.1)	143 (485)	13	40.7	8.1	367	7	48.6	9.4	491.3
	±	19.1	1.8	128		23.9	4.5	300		15.4	5.8	390

TABLE III
EFFECT OF LUNCH ON SIGMOID MOTILITY OF PATIENTS HAVING HAD AMOEBIC DYSENTERY AND CONTROLS

	Amoebic Series (15)			Control Series (13)		
	Duration of Activity	Mean Activity	Prod	Duration of Activity	Mean Activity	Prod
Before lunch	42.2	9.0	362	36.5	9.1	335
	± 27.1	± 2.8	± 236	± 16.4	± 3.7	± 177
After lunch	56.7	11.7	625	52.3	12.0	637
	± 25.9	± 5.5	± 324	± 17.4	± 1.9	± 432
Difference	14.5	2.7	263	15.8	2.9	302

FIG. 2. Trace showing the effect of posture upon motility. The patient lay down at the time of the signal (heavy line).

period. Three complained of abdominal distension and discomfort, and two complained of epigastric pain which was relieved by the passage of flatus. The effect of lunch on these five patients was more marked than the effect on those patients who did not have symptoms but the difference between the groups could have occurred by chance between one time in 10 and one time in 20.

EFFECT OF POSTURE In the 25 patients (19 amoebic, six controls) in which the effect of posture on motility was assessed, transient effects were noted in 13 when the patient sat up and in 16 when the patient lay down (Fig. 2). The effect was variable and in

any given patient there might be an increase on sitting up with a further increase on lying down or alternatively the opposite effect might occur. On sitting up, eight persons showed an increase in activity, five showed a decrease, and the remaining 12 showed no change as compared with the period immediately preceding. On lying down again, eight persons showed an increase in activity, eight showed a decrease, and nine showed no change. There was no difference in the effect comparing the post-amoebic group and the control group.

EFFECT OF PROSTIGMINE In general the effect of prostigmine was to cause a generalized increase in

FIG. 3. Typical trace showing generalized increase in bowel motility after prostigmine.

TABLE IV
EFFECT OF PROSTIGMINE ON MOTILITY OF SIGMOID COLON IN PATIENTS HAVING HAD
AMOEBIC DYSENTERY AND CONTROLS

	Control Series (7)			Amoebic Series (18)		
	Duration of Activity	Mean Activity	Prod	Duration of Activity	Mean Activity	Prod
Basal	28.1	8.3	258	41.4	9.1	399
	± 14.5	± 5.1	± 195	± 25.5	± 4.4	± 299
After prostigmine	47.6	13.3	748	74.8	17.1	1358
	± 19.8	± 7.3	± 629	± 19.7	± 8.5	± 955
Difference	18.5	5.0	490	33.4	8.0	959

FIG. 4. Change in percentage duration of activity in the second 30 minutes after prostigmine in the two groups.

bowel motility. Figure 3 is a typical example. Table IV isolates the findings in the patients in whom the effect of prostigmine on the sigmoid colon was determined. Comparing 18 dysenteric subjects and seven control subjects it will be seen that prostigmine results in a greater increase of both the duration of activity and the mean amplitude of the waves in the dysenteric subjects than in the control subjects. The difference is most marked when the duration of activity alone is considered, and Fig. 4 sets out the change in percentage duration of activity in the second 30 minutes following prostigmine on the two groups. This difference in the response to prostigmine could have occurred by chance less than one time in 20.

DISCUSSION

In view of the fact that the condition described here as post-dysenteric colitis has no definite diagnostic criteria there may not be a homogenous group, as the patients are grouped solely on the basis of the common history of dysentery with the persistence of an altered bowel habit. There are two findings in this study which provide a rational basis for a separation of this group from a control series. The first was our impression that the colonic mucosa as viewed sigmoidoscopically was more friable in patients who had post-dysenteric symptoms. The friability was never marked and frank spontaneous bleeding such as may occur in true ulcerative

colitis was not seen. Friability, however, is not a feature of a normal mucosa. The second difference between the groups which was unlikely to have occurred by chance was the motility response to prostigmine. This was the only aspect of colonic motility which appeared to be altered in the symptomatic group as basal motility, and the responses to the physiological stimuli of eating and change in posture were identical in the two groups. This result suggests that an attack of dysentery may leave the intestinal wall hypersensitive to extrinsic cholinergic impulses, while the similarity of the response to eating in the two groups suggests normal intrinsic gastro-colic responses.

The increased sensitivity to prostigmine recalls the finding of Chaudhary and Truelove (1961) that patients in Great Britain suffering from the irritable bowel syndrome also had an exaggerated response to prostigmine, although the difference between the responses of patients and controls was greater in this series. The majority of their patients at no time had an overt infection with *Entamoeba histolytica* so that this exaggerated response to cholinergic stimuli may be the end-result of a variety of pathological processes.

SUMMARY

The motility of the pelvic colon of a group of Egyptian patients who had recurrent bowel symptoms following a proven attack of amoebic dysentery has been compared with a group of control persons from the same population who were not known to have had acute dysentery at any time and who had no disturbance of bowel function. The sigmoidoscopic appearances of the mucosa of the symptomatic group differed from that of the control series in being redder and more friable.

The motility response of the post-amoebic group to prostigmine was greater than that of the control group although the basal motility and the response to the physiological stimuli of eating and of change in posture was the same.

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