CHRONIC ULCERATIVE COLITIS IN CHILDREN.

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By ulcerative colitis is meant in this paper a chronic ulcerative condition of the colon, inflammatory in nature, and accompanied by frequent loose motions containing blood and mucus.

Other conditions associated with a minor degree of acute ulceration occasionally are found in infants and young children, but in them the acute enteritis, rather than the few ulcers associated with it, dominates the picture. The disease, as characteristically seen in adults, is very rare in childhood, and the case herein described served to stimulate a search in the literature that has only yielded nine other proved cases, giving a total of 10 in all. Six other probable cases are added. Text books are reticent on the subject.

The rarity of the disease is proved by the additional fact that Helmholtz, in his first account, could only find one other case, that of Logan, reported. Allchin in an address to the Royal Society of Medicine on the subject in 1908 stated: "I have never seen (in children) post mortem the appearance in the large intestine in any way resembling that which is constant in the disease (in adults)." Horder at the same meeting referred to six cases, all infants, aged 3, 4, 6, 8, 10 and 18 months respectively. Three of these were undiagnosed during life and four of the six had vomiting as well as diarrhoea; they therefore are not comparable with the chronic condition found in the case quoted below, the acuteness and absence of symptoms placing them in a different category.

Case.

Olga Y., aged 7, was admitted under the writer's care to the East London Hospital for Children, Shadwell, with the complaint of diarrhoea, the motions containing blood and mucus.

The disease began two years previous to admission with an attack of diarrhoea. This was not preceded by any other illness. Subsequently the stools remained loose, but became more frequent from time to time. The usual frequency for the 24 hours was about 4-6, and at the time of the exacerbation they rose to 10-12. There had not been any period of remission. The increase in number had been accompanied from the first by the presence of blood and slime. During exacerbations this became more marked. Abdominal pain was also present occasionally.

She was born in Egypt and lived there for the first two years of her life, an interval of three years intervening between this and the colitis. She had had chicken pox a few months before admission. There was no history of hæmaturia, diarrhoea or any other disorder. Her father had suffered from bilharziasis whilst in Egypt. There was no history of tuberculosis in the family.

Nutrition was fair (weight 3 stone 3 lbs.). The child was of a sallow complexion. There were no dilated venules on the cheeks. The head, neck and chest were normal in all respects. The abdomen was slightly full and a little tender on palpation, but not particularly so in any one situation. The liver and spleen were not palpable. The stools were fluid, unformed and contained little isolated flakes of yellowish faecal material, some of them tinged with blood. Streaks of mucus streaked with blood were also present. The urine was normal, containing no blood or albumen.

The following pathological examinations were performed by Dr. Crawford.

Blood Count. R.B.C. 4,600,000; Hb. 60%; W.B.C. 12,000 (Eosinophiles 240 per c.mm.).

Examination of Stools (repeated three times). No non-lactose fermenting bacilli grown. No amœbæ or cysts and no bilharzia ova seen. Numerous red blood cells and pus cells present.

A sigmoidoscopic examination by Mr. J. E. Adams showed that the large bowel was severely diseased; a number of small ulcers were seen and the mucous membrane was thickened and bled readily. There were no polypi. A piece of diseased mucous membrane was removed and examined by Dr. Crawford. No parasites were seen in it, and no non-lactose fermenting organisms were isolated from it.

On this evidence it was assumed that the child was suffering from ulcerative colitis of the adult type.

Treatment.

She was confined to bed during the whole period of treatment.

Diet. At first she received Allenbury's Food (No. 2), milk, orange juice and three biscuits per diem. As improvement occurred this was changed to Allenbury's Food (No. 3), and custard and jellies were added. Finally when the stools began to look formed bread and butter, fish, potatoes and eggs were also given.

Drugs. On the analogy that a child has greater recuperative powers than an adult and on the grounds that she had already been treated unsuccessfully in three other hospitals, it was determined to push drug treatment energetically. The history of her birth in Egypt suggested that an infection by the bilharzia *Mansoni* or amœba *histolytica* was possibly at the root of the trouble in spite of the negative pathological findings and the interval of three years health. The pre-arranged programme was therefore to try the effect, in turn, of antidyenteric serum, emetine and antimony tartrate.

Anti-dysenteric serum was used, not because it was likely that bacilli would have persisted for such a period of time, but in accordance with Hurst's experience of its effect in ulcerative colitis of unknown ætiology. The colon was irrigated once daily with 1 in 5,000 flavine in normal saline, later with collosol silver 1 in 10,000. The change in her condition did not synchronise with the change in this local treatment. The serum was given on alternate days in doses of 30, 40, 25 and 50 cc.; it had no effect upon the number of stools or their looseness; the blood and mucus remained present in unchanged amount.

After ten days interval emetine hydrochloride gr. $\frac{1}{4}$ per diem subcutaneously was given for four periods of three days, with an interval of three days between each period, and during this time emetine bismuth iodide gr. ii. was given three times per diem by the mouth. She received in all 6 grs. of emetine and 126 grs. of emetine bismuth iodide. After this course of treatment the stools became definitely fewer in number, but remained unformed and contained blood and mucus as before.

Ultimately, after a pause of 12 days, antimony tartrate in increasing doses was given intravenously, a week intervening between each injection; the doses were $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$ grs. After the third injection blood and mucus had disappeared from the stools, and seven weeks after the first dose the child left the hospital. The motions were then formed, no longer fluid and contained neither blood nor mucus. Owing to the fact that she was then taken to Australia, whence enquiry has elicited no reply as to her subsequent state of health, it is impossible to say whether the cure has been permanent. Judging by all possible standards she was apparently well on discharge.

ANALYSIS OF THE RECORDED CASES.

In compiling the following table only proved cases of the condition have been included. The criteria used have been the presence of blood and mucus in the stools, diarrhœa and naked eye evidence of chronic disease of the colon. Radiographic evidence alone has been disregarded, as has a glazed appearance of the muscosa without ulceration.

CASE.	Sex & Age.	Onset.	Fever.	Hb. %.	Stool.			Proctoscope ? ulcers.	Duration (years).	Remissions.	Treatment.			Result.
					No.	Blood.	Mucus.				Operation.	Irrigation.	Transfusion.	
1. Logan ...	M. 10	Acute	Considerable	50	3-5	+	+	+	—	0	Hot saline	0	Improved	
2. Helmholtz	F. 10	Acute	Low	60	8-10	+	+	—	8½	1 for 6 mos.	Cæcos- tomy	Saline	0	Cured
3. Helmholtz	F. 11	Gradual	None	42	10-12	—	—	+	3	0	Ileostomy	Saline	+	Improved
4. Helmholtz	M. 8	After Scar- let fever	Considerable	61	Fre- quent	+	+	+	1½	1 for 17 mos.	Cæcos- tomy	—	+	Died
5. Helmholtz	F. 15	Acute	—	81	5-6	+	+	+	1½	1 for 1 mon.	Appendi- costomy	—	+	Died
6. Curtis ...	F. 6	—	Present	68	6-12	+	+	+	4	0	Ileostomy	Saline	0	Improved
7. Bourne...	F. 7	Gradual	Slight	60	4-10	+	+	+	2½	0	0	Flavine & Colloidal silver	0	? Cured
8. Helmholtz	F. 10	Acute	Considerable	50	7-8	+	+	+	2	0	0	0	+	Cured
9. Helmholtz	F. 11	Acute	—	(Lowest 15—65)	5-7	+	—	+	2	0	0	0	+	Improved
10. Helmholtz	F. 12	Acute	—	61	6-8	+	+	+	1	0	0	0	0	Improved

0 = absent.
— = no information.

SYMPTOMS.

It appears that the disease in children is of the same chronic nature as it is in adults. The shortest recorded duration was 14 months, the average nearly three years, and the longest $8\frac{1}{2}$ years. There is nothing characteristic about the age incidence of the condition except that it does not seem to appear in infancy. Of the 10 cases seven were between the eighth and twelfth year, at the time of their coming under observation. Girls appear to be rather more liable than boys, the relative numbers being eight girls to two boys.

The symptomatology is characteristic and definite and is not distinguishable from that of the adult type of the disease. Diarrhœa with blood and mucus, abdominal discomfort, some degree of loss of weight and a considerable secondary anæmia, are the chief signs and symptoms. A low degree of fever was present at some time in five cases. In all of the tabulated cases proctoscopic examination showed an ulcerated mucosa. In six of the cases where a radiographic examination was made the appearances were characteristic. First, the lumen of the colon as a whole was definitely narrowed; secondly, the sacculi present in the normal colon were no longer seen. In eight of the 10 cases examinations of the stool for the presence of amœbæ and other protozoal parasites, for ova and for dysentery bacilli, were negative. In six tubercle bacilli were looked for without result. In three the blood serum was examined for the presence of agglutinins against dysentery bacilli and in one of them the result was a weak positive against Flexner's bacillus. Serum treatment here was without effect. The other results were negative. All cases had a definitely lowered hæmoglobin content of the blood. This averaged 60% for the 10 cases at the first examination, and in one a reading of 15% is recorded.

REMISSIONS AND EXACERBATIONS.

All except one showed the presence of definite exacerbations. During these the stools became more in number and contained more blood and mucus, and the temperature became raised. Seven cases had no remission, three had one remission. These were as a rule for a period of about six weeks; one was for as long as 17 months. Two occurred in cases ultimately fatal.

COMPLICATIONS.

Transient arthritis (both knees) occurred in one case; abscess formation from direct extension into the right psoas region in one, and peri-rectal abscess in two; buccal and œsophageal ulceration (with perforation into the right pleural cavity) occurred once.

RESULT.

Two of the 10 cases died, one was cured, the remainder were improved, but not cured when reported upon. The writer's case was without symptoms or abnormal signs when last heard of.

TREATMENT.

Locally. Colonic irrigation with 1 in 5,000 flavine in normal saline or with hot normal saline appears to be of some use.

Operative. In four cases the bowel was brought to the surface with the idea of preventing faecal irritation of the diseased colon, and of lavage through this from the opening. Cæcostomy was done twice and ileostomy twice. One of the former and both the latter operations were followed by improvement. Appendicostomy was done in one case and was eventually followed by death as was the other cæcostomy.

GENERAL TREATMENT.

Diet. A fluid diet consisting chiefly of milk appeared to be most easily tolerated, though Logan's case was better with a full diet. Food leaving residue is contra-indicated.

Drugs. There is no drug which stands out as being of value in this condition. Search must be made for any possible ætiological agent and the individual case treated on its merits.

Two measures other than local irrigation may be of use in dealing with the colonic condition, the administration of kaolin in half drachm doses, and a systematic and pathologically regulated attempt to flood out other intestinal flora by means of *B. acidophilus*.

Transfusion, appears to be a valuable means of treating the secondary anæmia which is sometimes severe. It was followed in two of Helmholtz's cases by a striking improvement in the local symptoms also. The almost universally low hæmoglobin figures are argument enough to urge that this form of treatment be tried and even repeated.

CASES NOT YIELDING CONCLUSIVE SIGNS.

Besides these 10 cases whose authenticity is beyond doubt there remain the following seven cases purporting to belong to the group.

Cases I. and II. Cautley reports two cases, both boys aged 9, who had suffered from diarrhoea and the passage of blood and mucus. There is no report as to the proctoscopic condition, the microscopical examination of the stools, the presence of anæmia, or of fever. The duration was two years and fourteen months. Both cases were improved. Irrigation with silver nitrate was tried in one of them with some success.

Helmholtz in his second account, besides the three cases included in the above table, describes four others.

Case III. (Case 2 of his paper). A boy aged 11 was brought with diarrhoea. The motions had been streaked with blood. The hæmoglobin was 76%. Microscopically the stool contained erythmocytes and pus cells, no parasites or ova. Proctoscopic examination revealed "the granular glazed mucosa generally associated with ulcerative colitis." The X-ray later "indicated ulcerative colitis." A transfusion of 400 cc. of maternal blood was followed by a great improvement.

Case IV. (Case 3 of his paper). A boy aged $8\frac{1}{2}$ had similar symptoms. The hæmoglobin was 71%. *Entamoeba histolytica* was found in one stool. Proctoscopic examination showed a "mild granular appearance of the mucosa." Radiographic examination later was definitely positive for chronic ulcerative colitis. Transfusion here again was followed by improvement.

Case V. (Case 4 of his paper). A boy aged 12 came with watery blood-streaked stools. Before admission "it was thought that an amœba" had been found. The hæmoglobin was 65%. The radiograph was "typical of chronic ulcerative colitis." Proctoscopic examination revealed diffuse hyperæmia of the recto-sigmoidal mucosa with the "typical granular glazed appearance of ulcerative colitis." The child was slightly improved by treatment.

Case VI. (Case 7 of his paper). A boy aged 7 complained of the passage of blood and mucus from the bowels. The hæmoglobin was 65%. The X-ray was negative. The proctoscope suggested a diagnosis of "granular proctosigmoiditis."

Case VII. Miller in an account of celiac disease mentions under the head "Chronic enteritis of the dysenteric type" a case of a girl of 6. The onset was indefinite and the symptoms were diarrhœa and wasting. The stools contained mucus, pus and blood. No dysenteric organisms were found. Many relapses occurred and she died four months after discharge.

Cautley's two cases, the first three quoted of Helmholtz and that of Miller appear to be cases of ulcerative colitis. The absence of ulceration in some of them is presumably a measure of their early or mild nature. The histories of the passage of blood, mucus and pus with diarrhœa, without other sufficient cause, when taken with the radiographic and sigmoidoscopic evidence, are suggestive. But in none of the seven is the evidence conclusive and in the last case of Helmholtz it is frankly insufficient. The finding of amœbæ in two of Helmholtz's cases is an interesting point, but the streptococci isolated from the stools of three others appear to be accepted by him as the causative organism upon very insufficient grounds.

CONCLUSIONS.

The clinical picture provided by the disease is one of continued **fæcal** irritation of the colonic mucosa rather than of a progressive destruction of that organ. The balance between destruction and repair is so nicely held that the disease may last for years. The continuous slight drain of blood and fluid and the absorption of toxins from the diseased surface add the remaining characteristics.

It appears to the writer that some primary occurrence takes place as a result of which the power of the colonic mucous membrane to resist the passage over it of the heavily infected fæces becomes impaired, with the result that continued local ulceration and consequent thickening and fibrosis occurs. What this primary occurrence may be it is not easy to guess. Presumably it is frequently an infection and possibly one that does its damage and sometimes dies. The effect of antimony in the writer's case, of antidysenteric serum as used by Hurst, and the finding of amœbæ in two of Helmholtz's second series of cases all point to the possible truth of this supposition. The work of Bergen, who isolated a diplococcus from the

colonic mucosa of patients, inoculated it intravenously into rabbits and produced a disease similar to ulcerative colitis, needs more bacteriological and experimental confirmation, before acceptance. Whether in the case above recorded bilharziasis was the factor at the root of the trouble was never proved, but the fact that the patient had lived in Egypt, coupled with effect of antimony tartrate, is suggestive. It is conceivable that antimony tartrate is of use in the disease apart from any known ætiological factor, but this is a point that needs further proof. It would seem that if the unknown ætiological factor can be removed recovery is possible.

SUMMARY.

A case of ulcerative colitis in a child is recorded.

An analysis of 10 other proved cases found in the literature is made.

REFERENCES.

- Bargen, T. A. : *Journ. Am. Med. Assn.*, Chicago, 1924, xxxiii, 332.
 Cautley, E. : *Clin. Journ.*, 1906, xxviii, 28-32.
 Curtis, E. T., *Bull. Washington Univ. School Med.*, 1925, xix, 1-2.
 Helmholtz, H. F. : *New York State Journal of Med.*, 1926, xxvi, 46.
 Helmholtz, H. F. : *Am. J. Dis. Child.* Chicago, 1923, xxvi, 418.
 Logan : *North West Med. Washington*, 1919, xviii, 1-9.
 Miller, R. : *Lancet*, 1926, i, 330.