TABLE I.—*Lupus Vulgaris Treated with Intradermal Injections of Hydnocarpates (15 Cases)*

Case	Age	Site of Disease	Duration of Disease in Years	Length of Treatment	*Approximate Size of Active Areas in Square Centimetres		Condition at Present Date
					Before	After	
1	35	Neck	10	9 months	27	Nil	Quiescent (see Plate)
2	29	Elbow	14	3 years	—	Nil	Quiescent (see Plate)
3	35	Forehead and forearm	24	3 "	—	—	Much improved
4	48	Forearm	40	3 "	25	3	Quiescent except for few nodules
5	18	Arm	10	6 months	—	Nil	Quiescent
6	27	Face and neck	13	2½ years	17	Nil	Quiescent
7	12	Thigh	2	9 months	9	Nil	Quiescent
8	14	Face	10	10 "	—	Nil	Quiescent
9	39	Face and neck	25	12 "	—	—	Slight improvement. Ceased treatment
10	14	Thigh	3	11 "	25	Nil	Quiescent (see Plate)
11	24	Neck and wrist	23	2½ years	36	20	Much improved; wrist quiescent. Ceased treatment
12	11	Cheek and ear	10	3 "	3	2	Slight improvement
13	29	Face	27	3 "	18	14	Slight improvement
14	13	Buttocks	8	18 months	19	8	Much improved. Ceased treatment
15	39	Wrist	27	15 "	—	—	Quiescent except for few nodules

* Measurements are impracticable in some cases.

TABLE II.—*Summary of Results (15 Cases)†*

Quiescent, with pale healthy scars	7
Quiescent except for few active nodules	2
Much improved	3
Slight improvement only	3
	15

† Three cases were abandoned for reasons unconnected with the treatment. Two of these (Cases 11 and 14) are included in the "much improved" group; the other (Case 9) in the "slight improvement only" group.

reported by Burgess. Reactions, too, are definitely less painful than those resulting from the usual caustic applications.

The cost is trivial, and the technique is so simple that the time factor at each session is reduced to a minimum. Patients as a whole have expressed satisfaction with the treatment and have attended with great regularity—a point of no little significance.

The intradermal injection of hydnocarpates, in the small number of cases so far available, has produced extremely encouraging results, and appears to offer certain advantages over other routine methods. Further clinical trials are awaited with interest and some degree of confidence.

I have to express my thanks to Sir Leonard Rogers and to Dr. T. A. Henry for their helpful interest. I am also indebted to Dr. G. Lissant Cox, central tuberculosis officer, and to Dr. E. H. A. Pask, consultant tuberculosis officer, both of the Lancashire County Council, for permission to publish these findings.

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IDIOPATHIC STEATORRHOEA

REPORT OF A CASE ARISING IN ADULT LIFE

BY

A. M. NUSSBRECHER, M.D., M.R.C.P.

Physician to Selly Oak Hospital, Birmingham

AND

F. MORTON, B.Sc., A.I.C.

Biochemist to the Hospital

It is largely due to the work of Hess Thaysen that attention has recently been drawn to persistent diarrhoea found in adults in non-tropical countries. This condition has variously been called idiopathic steatorrhoea, non-tropical sprue, and "Gee-Thaysen's disease." Following Hess Thaysen's observations (1929) several important series of cases have been collected (Holmes and Starr, 1929; Bennett, Hunter, and Vaughan, 1932; Thaysen, 1935; Moore *et al.*, 1936), whilst isolated instances, some of which bring new and interesting points to light, have also been recorded (Mackie, 1933; Fullerton and Innes, 1936). In the majority of the cases described the symptoms apparently originated in childhood, the diarrhoea and tetany recurring in adult life with intermediate periods of remission. In many of these instances there was evidence of rickets, infantilism, and gross bony deformities. Bennett, Hunter, and Vaughan (1932) concluded from their observations that the spontaneous occurrence of the disease in adult life, though not impossible, would be very rare. The later studies of Hess Thaysen (1935) have shown that onset of symptoms in adult life is not so infrequent as was formerly believed. The same author has stipulated as criteria of the disease the following four points. "(1) an abnormally large quantity of fat excreted in the faeces; (2) a normal or in some instances a slightly increased nitrogen excretion; (3) a flat blood-sugar curve; and (4) a raised basal metabolic rate." Our own case conforms with the first three of these points, and reveals several other interesting features which make it worth recording.

Case Record

Clinical History.—The patient, a female 40 years of age, was quite well until seven years ago, when fourteen days after her last confinement she began to have "dysentery." She counted as many as twenty motions a day (an average of about fifteen), and frequently had to get up at night for bowel actions. She noticed the stools were offensive, greyish white in colour, frothy, and occasionally slimy but never blood-stained. She had been feeling weak and cold for a considerable time, and since May, 1936, had experienced cramps in the hands and feet and occasionally in the abdomen. These cramps occurred mostly on exertion, and also appeared to be precipitated by the menstrual periods. While they were present the fingers were drawn into the palms. Her feet and legs had swollen, especially after she had been up for some time, and her face had also swollen occasionally. She had lost weight from 10 st. 12 lb. three years ago to a present average of 8 st. Her periods have been regular, but the actual loss only slight.

The patient first came to our notice on August 14, 1936, when she was admitted to Selly Oak Hospital in an actual attack of tetany. Her condition then was as follows: Fairly well covered, colour good, no pigmentation, teeth in good condition. Slight oedema present over feet and lower parts of legs. Carpo-pedal spasm present. Trousseau's and Chvostek's signs positive. Marked hyperexcitability of all muscles, including those of the tongue. Slight glossitis noted. Heart and lungs normal. Blood pressure 120/80. Abdomen was distended and rectum somewhat ballooned. The urine showed no abnormality.

Progress and Investigations.—For the first week after admission the number of stools (putty-coloured and offensive) averaged about five a day, but later dropped to one a day. Ammonium chloride, 30 grains t.d.s. by mouth, was sufficient to check the tetany in about forty-eight hours.

On August 17, 1936, the serum calcium was 6.8 mg. and the plasma phosphorus 2.9 mg. per 100 c.cm. On August 22 the red cells numbered 4,840,000 per c.mm., the haemoglobin percentage was 86, and the colour index 0.9. There was slight anisocytosis, and the average size of the red cells was 7.5 microns. Examination of the faeces showed no occult blood. The total fats comprised 34 per cent. of the dried material: the neutral fat was 4.8, the free fatty acids 15.2, and the soaps 14.1 per cent. On August 19 calcium lactate, 30 grains three times a day, was started by mouth; on the 25th the serum calcium was 8.1 mg. and on the 29th 8.2 mg. per 100 c.cm.

A fractional test meal showed achlorhydria. X-ray examination of the tibia with control showed no decalcification, and a barium enema demonstrated a marked dilatation of the colon.

The patient was discharged on completion of these investigations at her own request.

SECOND ADMISSION

She was readmitted on November 17, 1936, with the following history: After leaving hospital she remained well only for about a week, when the diarrhoea returned (about eight stools per day). Spasms in limbs returned also, but with greater severity. Between the major spasms she had the sensation as if something were creeping under the skin all over the body.

On readmission she was in severe carpo-pedal spasm, which necessitated immediate injection of 20 c.cm. calcium laevulate intravenously. She was then given ammonium chloride, 30 grains t.d.s., and calcium lactate 40 grains four-hourly, but without apparent effect. The spasm returned on the 20th, when the serum calcium stood at 6.3 mg. per 100 c.cm. and the plasma phosphorus at 1.5 mg. Another 20 c.cm. of calcium laevulate intravenously brought relief, but though further 10-c.cm. injections were given on the 21st and 22nd, a severe spasm occurred on the 23rd, which was countered with a further dose of 20 c.cm. calcium laevulate. Ten units of parathormone on the 24th did not prevent another spasm on the following day, this being again relieved by intravenous calcium laevulate. Just prior to this attack the serum calcium stood at 6.2 and the plasma phosphorus at 2.2 mg. per 100 c.cm. Six further injections of 10 units of parathormone were given on alternate days, but they had no immediate marked effect on the level of the serum calcium, which on the 27th was still 6.2 mg., and on the day after the last injection of parathormone (December 7) rose only to 7.2 mg. per 100 c.cm. Her general condition was, however, very much improved, and although all administration of calcium was discontinued from December 8, the serum calcium rose to 8.4 mg. on the 16th.

A slight oedema of the legs persisted during this period in hospital in spite of complete rest in bed, whilst occasionally her face was puffy. This oedema was found to be associated with consistently low serum protein values, as the following figures show:

23/11/36	..	Total serum protein	4.9	grammes per 100 c.cm.
27/11/36	..	" " "	5.0*	" " "
8/12/36	..	" " "	5.1	" " "
16/12/36	..	" " "	4.6	" " "

* Albumin 3.5 grammes; globulin 1.5 grammes.

The following investigations were also carried out during this second period of admission:

Glucose Tolerance Test.—Fasting blood sugar 63 mg. per 100 c.cm. After 50 grammes by mouth: 1/2 hour, 68 mg.; 1 hour, 76 mg.; 1½ hours, 88 mg.; 2 hours, 88 mg.; 2½ hours, 88 mg.

Basal Metabolic Rate.—Minus 5 per cent. of statistical normal (R.Q. 0.85).

Renal Function Test:

Urea Concentration				
	Vol.	Urine urea	Time	
Before urea ..	60 c.cm.	0.84 %	..	60 min.
1st hour after urea ..	188 c.cm.	0.65 %	..	60 min.
2nd " " " ..	86 c.cm.	2.34 %	..	60 min.
3rd " " " ..	33 c.cm.	2.85 %	..	30 min.
Blood urea before urea by mouth during first hour, 19 mg. per 100 c.cm.				
Standard urea clearance, 82 per cent. of normal value (van Slyke).				
Blood urea during second hour after urea, 58 mg. per 100 c.cm.				
Standard urea clearance, 89 per cent. of normal value.				

Calcium and Phosphorus Balance.—The calcium intake during the three-day period was 0.54 gramme. The calcium output during the three-day period was: in urine 0.058 gramme, and in faeces 0.761 gramme, giving a total of 0.819 gramme. The phosphorus intake during the three-day period was 1.341 gramme. The phosphorus output during the three-day period was: in urine 0.862 gramme, and in faeces 0.865 gramme, giving a total of 1.727 grammes.

Daily Fat Excretion.—On a diet containing 39 grammes of fat per day a twenty-four-hour specimen of faeces contained 13 grammes total fat. The same dried stool contained: neutral fat, 9.3 per cent.; free fatty acids, 19.7 per cent.; soaps, 22 per cent.

Blood Examination.—The red cells numbered 4,960,000 per c.mm., and the haemoglobin percentage was 96. The blood cholesterol amounted to 136 mg. per 100 c.cm.

The urine indican reaction was strongly positive.

X-ray examination of long bones with control again showed no evidence of decalcification.

We are indebted to Mr. Philip Jameson-Evans of the Birmingham and Midland Eye Hospital, who kindly carried out a slit-lamp examination and found two circular opacities in the left lens.

THIRD ADMISSION

The patient was discharged on December 18, 1936, on a low fat diet, adequate calcium, hydrochloric acid, and vitamin D, but this did not prevent a recurrence of tetany, which necessitated readmission for the third time on January 7, 1937. Intravenous calcium was needed as before to check the spasms. During this admission we took the opportunity of confirming our previous findings on daily fat excretion, together with an investigation of the nature and origin of the excreted fat; the nitrogen balance was also determined whilst the patient was stabilized on a fixed diet (carbohydrate 114, fat 39, protein 31 grammes). The results of these investigations were as follows. Of the 39 grammes of fat in this diet 35.6 grammes consisted of butter, the characteristics of which were: saponification value 231, and iodine value (of the free fatty acids) 32.7. The total fat excreted per day amounted to 14.7 grammes, and this had the following characteristics: saponification value 208, iodine value (of the free fatty acids), 19.6.

Nitrogen Balance.—Intake during two days was 9.8 grammes, the urinary output 11.5 grammes, and the faecal output 0.5 gramme, giving a total of 12 grammes. The negative balance, therefore, was 1.1 grammes per day.

Blood examination showed 4,000,000 red cells per c.mm., and 76 per cent. haemoglobin.

Blood-sugar curve.—10 grammes of glucose were administered in the form of a 5 per cent. solution intravenously over a period of fifteen minutes. The fasting blood sugar was 95 mg. per 100 c.cm., ten minutes after the injection was completed it was 140 mg., half an hour later 90 mg., and one hour later 90 mg. per 100 c.cm.

Discussion

Careful inquiry into the history of our case disclosed no evidence of diarrhoea or tetany prior to the onset of the present condition at the age of 34. This instance therefore supports Hess Thaysen's postulate that there is no reason why idiopathic steatorrhoea should not arise in

adult life in non-tropical countries. In common with the majority of cases already described our patient presents a persistent fatty diarrhoea, low serum calcium and phosphorus, actual or latent tetany, a flat blood-sugar curve after glucose ingestion, marked dilatation of the colon, and abdominal distension. She also shows achlorhydria and a moderate degree of glossitis, but no evidence of any marked anaemia.

In view of the recurrent tetany and the constantly low serum calcium, one would expect some evidence of skeletal decalcification, but the absence of this may perhaps be explained by the results of the calcium balance, which point to only a small loss of endogenous calcium. The nitrogen balance determination eliminates any possibility of the steatorrhoea being of pancreatic origin. Hess Thaysen has stressed the necessity of this investigation in the differential diagnosis of pancreatic and idiopathic steatorrhoea. Together with the urea concentration test the faecal nitrogen value indicates that, in contrast with the faulty absorption of fats and possibly of carbohydrates, nitrogenous products are efficiently absorbed by the patient. Under the existing circumstances one would look for some increase in the nitrogen metabolism, and it is probable that the loss of weight and the low serum protein value with its associated oedema are evidence of protein malnutrition, resulting not from any disturbance in digestion or absorption, but from a relative insufficiency of protein intake.

The interpretation of the results of the inquiry into the nature of the faecal fat is admittedly difficult, owing to lack of published data. The character of the excreted fat differs considerably from that of the ingested butter, indicating that total faecal fat measurements cannot be regarded as a quantitative index of the absorptive power of the intestine towards fats. The fact that the iodine value of the faecal fat is lower than that of the ingested butter is suggestive of its being derived from the food and not from endogenous fat, the iodine value of which is much higher. This would support the usually accepted theory that the steatorrhoea in such cases is due to deficiency in intestinal absorption rather than to the alternative possibility of derangement in the mechanism of excretion from blood into the intestine.

Treatment of our patient has been disappointing. In spite of adequate doses of calcium, vitamin D, hydrochloric acid by mouth, and a low fat diet relapses continue to occur, and it appears that the only measure which checks the diarrhoea effectively is complete rest in bed.

Summary

1. A case of idiopathic steatorrhoea originating in adult life is described.
2. A surprisingly good general condition of the patient and absence of bone decalcification in spite of persistently low serum calcium are noted.
3. Evidence is brought forward showing that absorption of fat and carbohydrate is inefficient, while that of protein is normal.
4. Persistent oedema associated with low serum protein is observed, and an explanation for this is suggested.

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THE CULTIVATION OF MYCO. TUBERCULOSIS FROM HUMAN SPUTA

BY

J. F. D. SHREWSBURY, M.D., D.P.H.

AND

J. BARSON

(From the Bacteriological Department, University of Birmingham)

The routine laboratory examination of sputum from suspect cases of pulmonary tuberculosis consists of the microscopical examination of appropriately stained films of the sputum. This is the only method recognized by the tuberculosis authorities for which they accept the financial responsibility. Every laboratory worker knows that it is only of use in positive cases and that a negative microscopical report on a single sample of sputum is of no diagnostic value. It is interesting to compare the reliance placed on the microscopical method in tuberculosis to the present position in regard to the laboratory diagnosis of diphtheria, yet there is no valid reason why cultural examination of sputum and other morbid materials for *Myco. tuberculosis* should not be practised as a routine procedure and be recognized as equal in value to the cultivation of *C. diphtheriae* from throat swabs, etc. Given a reasonably simple and effective technique, the examination can be incorporated in the ordinary routine work of the laboratory; *Myco. tuberculosis* is not a difficult organism to cultivate, though it is a slow grower even under optimum conditions.

We have tested the following technique over the past two years and have found it suitable for the routine cultural examination of sputum. Before incorporating the method in our routine work we carried out a large number of control cultivations on morbid materials in which *Myco. tuberculosis* was found by microscopical examination. This method yielded 100 per cent. positive cultural isolations from tuberculous sputum, cerebro-spinal fluid, faeces, urine, and pus. Having thus established to our satisfaction the value of the method, we then proceeded to apply it to the examination of a series of sputa that were negative for *Myco. tuberculosis* on microscopical examination.

Technique

Any volume of sputum up to a maximum of about 5 c.cm. is thoroughly mixed with an equal volume of 4 per cent. caustic soda solution. The mixture is incubated at 37° C. for thirty minutes and is then centrifuged—in our case for one hour at 3,000 r.p.m. (The speed and time of centrifugation can probably be safely varied to suit individual convenience so long as the entire quantity of particulate matter is firmly packed at the bottom of the tube.) The supernatant fluid is then carefully decanted and the deposit rendered neutral to litmus with 4 per cent. hydrochloric acid. As a rule about five drops of acid are required to neutralize the deposit from an initial volume of 5 c.cm. of sputum. The deposit is then thoroughly mixed up with a sterile glass rod and is thickly sown on to the selected medium.

Three media have been tested in the course of our work—namely, Löwenstein's, Petroff's and Petragnani's—employing the method of preparation described by Jamieson (1936). All three media have given successful results, but we have found Löwenstein's to be the best for routine use. In our experience different strains of *Myco. tuberculosis* have varied in their preference for these media, but