TRANSIENT MASSIVE ALBUMINURIA AFTER CHROMOCYSTOSCOPY IN A PSYCHO- NEUROTIC INDIVIDUAL

BY

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I have not succeeded in finding any account of a case in which cystoscopy or chromocystoscopy was followed by transient massive albuminuria as it was in the case reported below. But then the urine is not usually examined in this way twenty-four hours after a cystoscopy, and by another twenty-four hours the albuminuria had almost completely disappeared. I can find no published clinical or experimental support for my idea that the massive albuminuria represented an idiosyncratic reaction towards the intravenous injection of indigo-carmin. The non-appearance of the colour in the urine after the injection of indigo-carmin has usually been regarded as a bad sign, but presumably in the present case the indigo-carmin was excreted in the urine after having undergone transformation into a colourless substance. This need not have had any connexion with the subsequent transient massive albuminuria. I am much indebted to Mr. T. Dietzsch for his kindness in referring me to data about indigo-carmin.

One cannot help thinking of the massive albuminuria which has been observed occasionally after cerebral haemorrhage. J. Sabrazès and Ch. Massias in 1923 (abstract in the *Presse Médicale*, Paris, 1923, xxxi, 104) drew attention to such "massive" albuminuria, without tube-casts, in cases of cerebral haemorrhage. They found that in a young rabbit, when 2 to 3 c.cm. of its own blood was injected into its brain, albuminuria accompanied the resulting apoplectiform shock, the albumin in the urine reaching 4.6 per mille at the time of the animal's death, thirty hours afterwards. In connexion with the same subject one might also compare some of the phenomena of attacks of acute "angioneurotic oedema."

RECORD OF CASE

The patient, a well-nourished woman aged 26 years, was admitted to hospital on November 9th, 1933, on account of uncertain abdominal pains. For nearly ten years she had been troubled with frequent micturition during the day, but not (or much less) during the night. This pollakiuria had been supposed to be of psychoneurotic origin (in Germany) as early as 1925, but at that time there seems to have been evidence likewise of a *Bacillus coli* infection. Psycho-analytical treatment at Zürich and elsewhere is said to have had a beneficial result. In March, 1933, she commenced to complain of abdominal pains, and in September appendicectomy was performed for "chronic appendicitis"—but without relieving her main symptoms.

On November 9th, 1933, she was therefore admitted on the medical side of the German Hospital. Apart from somewhat vague abdominal pains and the pollakiuria, hardly anything abnormal could be discovered. By Roentgen-ray examination of the abdomen, two or three calcified lymph glands were evidenced. Nothing abnormal was found in the thorax. The urine (catheter specimen) showed a cloud of albumin, and the centrifuge sediment contained a few leucocytes and erythrocytes, but no tube-casts. Brachial blood pressure: 120/74 mm. Hg. Nothing abnormal by ophthalmoscopic examination. A Pirquet cuti-reaction gave a weakly positive reaction; as it does in most normal adults. Menstruation had commenced at 14 years of age, and had always been normal. There was a history of longevity on both sides of the family.

In order further to investigate the cause of the slight albuminuria and the source of the erythrocytes in the centrifuge sediment of the urine, a chromocystoscopy was kindly undertaken on November 14th by my colleague, Mr. A. Compton. It was, however, impossible to find the orifices

of the ureters, and therefore the ureters were not catheterized. The indigo-carmin (4 c.cm. of a 0.4 per cent. solution) injected intravenously was not observed to reappear in the urine. The mucous membrane of the urinary bladder was seen to be intensely congested, possibly as a reaction towards the irritation of the examination.

This cystoscopic examination (none had been previously made) was followed by some local pain, which, however, left her in two hours or so. But next morning (about twenty-four hours after the cystoscopy) her urine was found to be loaded with albumin (10 per mille by Esbach's tube), and, though it was not coloured with blood, the centrifuge sediment contained many erythrocytes and leucocytes; no tube-casts seen. A day later (November 16th) the urine showed only a thin "cloud" of albumin; there were a few leucocytes and a very few erythrocytes in the centrifuge sediment and (as before) no tube-casts. No culture of *Bacillus coli* could be obtained from the urine (November 22nd and on a previous occasion). In the hospital the pollakiuria was not accompanied by polyuria, and before she left (November 25th) the former was greatly diminished—possibly partly owing to her psychic condition having been entered into. Moreover, the patient altogether felt better.

DIABETES AND ULTRA-VIOLET IRRADIATION THERAPY

BY

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During the past twelve years reports have appeared in the literature regarding the beneficial effects of ultra-violet light irradiation on sugar tolerance and hyperglycaemia in diabetes.

Pincussen¹ found that irradiation produced definite improvement in a series of diabetic patients with regard to level of blood sugar and excretion of glucose and acetone. He gave no details of the clinical condition of the patients apart from the diagnosis of diabetes mellitus, but stated that those diabetics who had marked polyuria (hypophyseal diabetes) showed no improvement. Andersen² recorded a beneficial result in the treatment of one diabetic patient whose sugar tolerance increased from 24 to 96 grams of carbohydrate, and whose fasting blood sugar fell from 100 mg. per cent. to 70 mg. per cent. immediately after irradiation. Saidman³ has reported benefit from the use of ultra-violet irradiation in five patients, in two of whom a mild glycosuria completely disappeared. He considered that ultra-violet treatment was indicated in glycosuria associated with cutaneous manifestations, dental lesions, and malnutrition, and also in severe diabetes where insulin was necessary. Rothmann⁴ has given records of two diabetic patients treated with ultra-violet light. One with acne rosacea responded favourably, with disappearance of acetonuria and glycosuria (5.3 grams glucose daily) and a fall of fasting blood sugar from 183 to 120 mg. per cent. The other, who had generalized eczema, showed no improvement after ninety-five days, both blood sugar and glycosuria tending to increase. A patient of Rollier (quoted by Furniss⁵), aged 45 years, with benign diabetes mellitus of many years' standing and easily controlled by dieting, was able, after natural sunlight treatment, to live on ordinary hotel diet without glycosuria: after twenty-four hours without a sun-bath all the symptoms reappeared. J. Wilson,⁶ after a brief résumé of the literature, stated that all workers found decrease of glycosuria and acetonuria after ultra-violet irradiation of diabetic patients: he considered this treatment specially suitable for diabetes complicated by neuritis, carbuncles, and vasomotor and trophic disturbances. Rothmann⁷ also obtained good results in a case of diabetic xanthomatosis: in another diabetic with

pruritus the skin irritation disappeared after ultra-violet irradiation, although the fasting blood sugar rose from 140 to 210 mg. per cent.

All the reports in the literature that we have obtained have dealt with adults, and on the whole have been favourable. It is noticeable, however, that many of the patients successfully treated have had pathological conditions of the skin. In view of the well-known fact that sunlight has a marked effect on the development of children it seemed advisable to determine whether ultra-violet light influenced their sugar tolerance and insulin requirements. As diabetes in childhood is not usually complicated by other diseased conditions, such as arteriosclerosis or tuberculosis, it was hoped to decide whether the improvement observed in adults was the result of direct action on the carbohydrate-regulating system, or of a secondary effect due to alleviation of some other pathological condition such as skin lesions.

SCOPE OF INVESTIGATION

The immediate effect of irradiation on blood sugar was investigated in a few normal and diabetic children. Blood was withdrawn prior to, and immediately after, irradiation lasting two minutes. The children were in the post-absorptive state, having refrained from food for at least six hours previously. Table I shows some of the results obtained.

TABLE I

Name	Age in Years	Condition	Blood Sugar	
			Before Irradiation	After Irradiation
A. R. ...	8	Non-diabetic	66.0	58.0
J. H. ...	10½	"	83.0	53.0
E. G. ...	11	"	72.0	91.0
E. B. ...	6½	"	50.0	82.0
W. A. ...	10	"	68.0	59.0
M. H. ...	14½	Diabetic	126.5 138.8 98.0 100.0	133.5 133.5 85.1 100.4
S. N. ...	7½	"	80.9	66.6
W. D. ...	8½	"	149.2	161.2
P. McK. ...	10½	"	205.0 157.5	227.7 148.1
J. P. ...	11½	"	160.0	153.8
J. L. ...	8	"	108.0	117.6

Ultra-violet irradiation of five non-diabetic subjects produced in four an immediate fall of blood sugar and in one a rise, while irradiation of six diabetic patients on ten occasions led to an immediate fall in blood sugar on five, a rise on four, and no change on one. It is evident from these figures that irradiation may cause an immediate increase or decrease of the blood sugar both in non-diabetics and in diabetics. Furthermore, different results were obtained on different days with the same patient. These findings differ somewhat from those of Lucca and Reviglio,^b who reported that in children after irradiation with infra-red or ultra-violet rays the sugar content of the blood was always diminished, though there were individual variations in the decrease.

Despite these conflicting results it was determined to study the effect of a course of ultra-violet irradiation on carbohydrate tolerance in a series of diabetic patients.

MATERIAL TESTED

The subjects of the test were regular attendants at the diabetic clinic of the Royal Hospital for Sick Children,

Glasgow. All had been attending for at least six months, and some for five or six years. Their dietary and insulin requirements were fairly accurately known. The mothers of the children were all intelligent, and had been co-operating successfully with us. The possibility of improving sugar tolerance by ultra-violet therapy was explained to the mothers of all the children attending the clinic, and those that desired to try out the effect of this treatment did so enthusiastically, in the hope that the treatment might permit a decrease in the dose of insulin. The children of the more sceptical mothers acted as controls.

In all ten children (ages varying from 7½ to 14½ years) received ultra-violet therapy, and four (aged 2½ to 13 years) did not. The treatment was given twice weekly; at first one-minute exposures were given to the whole thoraco-abdominal region, dorsal aspect of the body, and limbs (small slips being worn and goggles). Gradually the exposures were increased by thirty seconds every week until three-minute exposures were given. The source of light was a mercury vapour vacuum burner (new) 250 volts D.C. Five minutes was allowed after lighting to permit the output to settle. The distance of the exposed area from the source of light was 36 inches. When pigmentation was observed the therapy was stopped for an interval, as most workers are agreed that pigmentation lessens the therapeutic effect. * (Rothmann^a states that when pigmentation occurs the blood sugar begins to rise.)

RESULTS OBTAINED

The following tables give a brief résumé of the results after ultra-violet irradiation had been given. The carbohydrate tolerance was estimated from the amount of total carbohydrate—that is, carbohydrate plus half the protein—utilized per unit of insulin. The weight and height were calculated as percentages of the expected weight and height respectively.

TABLE II

Name	Age in Years at July, 1932	Carbohydrate Tolerance		Percentage Expected Weight		Percentage Expected Height	
		Before	After	Before	After	Before	After
M. D. ...	11	4.1	8.0	86	87	95	95
A. McC. ...	7½	6.0	10.3	72	77	88	88
J. R. ...	12½	2.1	2.2	94	95	99	98
M. H. ...	14½	1.5	1.2	—	—	—	—
W. D. ...	8½	1.8	2.2	90	90	92	91
J. L. ...	8	15.0	10.5	83	80	96	95
A. G. ...	11	4.0	3.4	82	76	57	94
P. McK. ...	10½	2.8	1.7	93	94	105	103
S. N. ...	7½	3.0	2.6	100	95	97	96
S. U. ...	11½	2.4	1.7	82	86	92	90
C. F.* ...	2½	4.2	9.9	106	106	105	101
J. B.* ...	13	3.8	3.2	94	92	95	95
J. McR.* ...	1½	7.6	4.1	100	110	—	—
J. P.* ...	11½	2.6	2.4	97	89	98	97

* These patients did not receive ultra-violet irradiation therapy.

The carbohydrate tolerance improved in four out of the ten patients given ultra-violet therapy. The same proportion was found when the estimation was based on the absolute amount of insulin required, four patients requiring less insulin at the end of the year. In six patients, however, the tolerance diminished. Although the proportion with decreased tolerance was greater in those not receiving ultra-violet irradiation the numbers are much too small to make this difference significant.

The incidence of infection in the two groups was also noted with special reference to the occurrence of glycosuria. In the ultra-violet irradiation group three of the patients had mild infections—for example, nasal catarrh with or without mild pyrexia—and four had moderately severe attacks—influenza, adenitis, scarlet fever. Two of the latter four had to be admitted into hospital because of diabetic acidosis. Of the control group one patient had a mild enteritis and two had moderately severe attacks of adenitis necessitating their admission to hospital because of impending coma.

TABLE III*

	Total No.	Carbohydrate Tolerance			Percentage Expected Weight			Percentage Expected Height		
		Improved	No Change	Decreased	Improved	No Change	Decreased	Improved	No Change	Decreased
Receiving U.V.R. ...	10	4	—	6	4	1	4	—	2	7
Not receiving U.V.R.	4	1	—	3	1	1	2	—	1	2

*Cases receiving U.V.R.—data of height and weight from only nine cases. Cases not receiving U.V.R.—data of height from only three cases.

As regards other effects of the treatment, the mother of one patient stated that about one hour after irradiation the boy felt very limp, and that sugar had occasionally to be given because of the threat of hypoglycaemia. This particular patient was one whose carbohydrate tolerance per unit of insulin was reduced at the end of the year. Another patient (a boy of 13 years) stated that he felt better after ultra-violet irradiation treatment was commenced: in this case it had been noticed in previous years that during long spells of bright weather in the summer the insulin had to be reduced owing to a tendency to hypoglycaemic attacks.

SUMMARY

The effect of ultra-violet therapy on sugar tolerance, insulin requirements, growth, and general health was determined in ten diabetic children, aged $7\frac{1}{2}$ to $14\frac{1}{2}$ years, over a period of one year. The results, compared with those of a control series of four children who did not receive ultra-violet therapy, showed no significant improvement that could be attributed to the irradiation.

We should like to express our thanks to Professor G. B. Fleming for his interest in this investigation, and to the Medical Research Council for a personal grant to one of us (N. M.).

REFERENCES

- ¹ Pincussen, L.: *Biochem. Zeit.*, 1922, xxvi, 127.
- ² Andersen, A.: *Munch. med. Woch.*, 1923, lxx, 1484.
- ³ Saidman, J.: *Les Rayons Ultra-violet et Associés en Thérapeutique*, 1925, Doin, Paris, p. 736.
- ⁴ Rothmann, S.: *Zeit. f. d. ges. Exp. Med.*, 1923, xxxvi, 398.
- ⁵ Furniss, A.: *Brit. Journ. Actinotherap. and Physiotherap.*, 1931, v, 252.
- ⁶ Wilson, J.: *Clin. Journ.*, 1928, lvii, 97.
- ⁷ Rothmann, S.: *Strahlentherapie*, 1927, xxiv, 465.
- ⁸ Lucca, A., and Reviglio, G. M.: *Actinoterapia*, 1929, viii, 153.

We have received a specimen copy of the *Indian Journal of Pediatrics*, edited by K. C. Chaudhuri and published quarterly at Calcutta. This fifty-page issue contains six original articles, including one on "Feeding in Chronic Diarrhoea" and another on "Milk-free Diet in Pyuria and Eczema"; case reports; proceedings of societies; book reviews; and an abstract of current medical literature.

A CASE OF AXILLO-BRACHIAL EMOLECTOMY

BY

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The paucity of references in this country to the subject of arterial embolectomy suggests that the record of a single successful case is still worth the making.

CASE RECORD

A retired male railway worker, aged 64, was admitted to the Plymouth City Hospital complaining of vague abdominal pains and recently developed constipation. His history was one of good health, except that he had had a perianal abscess two years previously, and "phlebitis" in the right popliteal region six weeks before admission. Nothing abnormal could be detected in the popliteal region. He was well nourished, of a full-blooded appearance. Radiological evidence of carcinoma of the upper end of the sigmoid colon was obtained, and this was confirmed at operation on July 25th, 1933. Abdominal section by a paramedian incision was made and the growth located; through a left lateral oblique muscle cutting incision it was widely mobilized, and the first stage of a Paul-Mikulicz resection was performed. On August 5th, 1933, eleven days after operation, the patient complained of a sudden loss of power in the right arm and hand, accompanied by tingling pain and numbness. This occurred while he was washing himself. I saw him at 11 a.m., when he was still complaining of pain and numbness, and was rubbing the limb "to improve its circulation." The whole limb distal to the middle of the arm was pale and cold, with a blotchy cyanosis in the upper part of the cold area. The radial pulse was palpable, the brachial pulse could not be felt or heard at the elbow or in the arm, but about the level of the termination of the axillary artery a forcible pulse could be felt.

At 11.30 a.m., five hours after the onset, under local anaesthesia, the artery was exposed by an incision along its course, care being taken to preserve branches. The artery was mobilized; the site of lodgement of the embolus was easily detected, just proximal to the offset of the profunda artery. There was a local increase in the diameter of the non-pulsating axillo-brachial artery for about $1\frac{1}{4}$ inches. Proximal to this the axillary artery seemed to beat unusually powerfully; distally lay the brachial artery, contracted and pulseless. Light intestinal clamps, rubber-covered, were gently applied above and below the embolus, and a small incision, $1/3$ inch or so in length, was made into healthy artery above the upper end of the embolus, which was immediately partially extruded. It was carefully withdrawn. The distal clamp was released, and blood flowed from the distal end. The proximal clamp was then released somewhat, and blood flowed freely. With the clamps again controlling, the incision in the artery was closed by three mattress sutures of paraffined silk evertting the edges of the wound, and apposing the intima, and narrowing the arterial lumen as little as practicable. Throughout the operation the wound was sponged occasionally with 2 per cent. sodium citrate.

The clamps were released, and a good pulse was immediately palpable at the elbow, and a definite though less forcible pulse at the wrist. The wound was closed and healed perfectly. No splint was used, but the limb was swathed in wool. Shortly after operation the limb was definitely warmer, and twelve hours after operation there was a warm limb of apparently normal colour, with a radial pulse of good quality, though somewhat less forcible than that of the other arm. The pulse remained of good quality and the limb of normal appearance. At the present time, twenty-three weeks after operation, the right radial pulse is slightly less forcible than the left; there is, however, no difference in appearance or function between the two limbs.

Since the arterial operation the patient has undergone two further operations to restore the continuity of the intestine. Less drastic measures failing to produce closure of the colostomy, excision with end-to-end anastomosis was performed. He is now in good general health, and living his normal routine of retired life.