present attacks excluded the condition of cryptogenic hypoglycaemia.

The occurrence of hypoglycaemia unresponsiveness in the insulin-tolerance test, with restoration of a normal response after removal of the islet-cell adenoma, indicates a causal relationship and affords confirmation of the suggestion of Fraser, Albright, and Smith (1941) that organic hyperinsulinism would be expected to produce hypoglycaemia unresponsiveness in the insulin-tolerance test.

This case is typical of the cases of islet-cell adenomata already reported and illustrates many points. It shows the successful results of surgery in hyperinsulinism due to islet-cell adenomata. Medical treatment is indicated in cryptogenic hypoglycaemia but is dangerous in organic hyperinsulinism. A high-carbohydrate diet tends to fatten the patient and so makes for a poor operative risk later. Repeated prolonged hypoglycaemic attacks can cause permanent damage to the central nervous system. These tumours show a tendency to become malignant and there should be no delay in attempting operation.

From this case it would appear that the coma, muscular twitches, and altered behaviour—equivalent to Himwich's (1944) cortical and subcortical phases of hypoglycaemia—were due to the low blood-sugar level. The symptoms such as lassitude, headache, and visual disturbances would seem to be due to adrenaline secretion reflexly induced by a sudden fall in the blood-sugar level. The small dose of adrenaline given during the glucose-tolerance test seemed to aggravate the symptoms of hypoglycaemia without altering the blood-sugar level. This case also showed that amphetamine sulphate could temporarily relieve the hypoglycaemic attacks, presumably by raising the blood-sugar level.

A short post-operative period of hyperglycaemia has been found in cases in which blood sugars have been estimated. This would appear to be due to the partial depression of the activity of the normal islets, while the requirements of the body were covered by the adenoma. The insulin resistance after operation may be due to persistence of a high level of the insulin antagonists, such as the glycotropic factor of the anterior pituitary.

Finally, the case illustrates the great importance of accurate differential diagnosis in cases of spontaneous hypoglycaemia, the difficulty of attempting to diagnose hyperinsulinism by the glucose-tolerance test alone unless this is prolonged for several hours, and the value of the insulin-tolerance test in diagnosing organic hyperinsulinism.

Summary

A case of organic hyperinsulinism is reported. The condition was cured by the removal of an islet-cell adenoma. Glucose-tolerance and insulin-tolerance tests were carried out before and after operation. The usefulness of the latter in the differentiation of hyperinsulinism from other causes of hypoglycaemia is emphasized.

I wish to thank Professor John Craig for permission to publish this case, and Professor J. Young and Dr. W. M. Davidson for the pathological report. I am indebted to Dr. Ian A. Anderson for carrying out the insulin-tolerance tests and for his help and guidance so freely given.

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RINGWORM OF THE SCALP

TREATMENT BY X-RAY EPILATION WITHOUT SUBSEQUENT LOCAL APPLICATION

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The many ingenious attempts made by various schools to increase the efficiency of local treatment in cases of tinea capitis have so far been unsuccessful, and the latest report by Brain *et al.* (1948) on the effect of fungicides in penetrating bases, although suggestive, must be evaluated in the light of further experience before we can hope to dispense with epilation by x rays as the method of choice in these cases.

Sequeira, Ingram, and Brain (1947) state that "it must be realized that they [x rays] have no parasitocidal action, but are simply used to remove the hair, after which continuous treatment must be applied to the bald scalp in order to eradicate the fungus before the hair grows." Again, Becker and Obermayer (1947) say: "It is the long period between epilation and regrowth that gives roentgen irradiation a superior advantage over all other methods of epilation, for during this time the surface of the scalp can be rendered antiseptic. . . . After epilation is complete local treatment . . . is carried out vigorously until no evidence of the disease can be found."

It can be seen from the preceding quotations that x-ray epilation is regarded only as ancillary, and that it is the local application of fungicides that really brings about cure. The late Mr. G. Stebbing, Director, X-Ray Department, Lambeth Hospital, however, believed that local treatment was unnecessary, and it has been the policy at the Lambeth Clinic to treat all cases of tinea capitis by the following method.

Method

X-ray epilation is carried out by the four-field technique (four main fields and one subsidiary field), the following factors having been worked out by Dr. L. H. Clark.

Victor KX10 Apparatus.—K.V.P. 100. Half-value layer 1.6 mm. Al. Tube current 7mA. Primary volt reading 75v. (selector switch—high). F.S.D. 19.5 cm. Open field 16.6 in. (42 cm.) diameter.

Dose.—Four main fields: 500 r skin dose (backscatter factor, 1.24). Subsidiary field: 124 to 160 r according to the size of the patient's head, the average being 142 r. In very small children this, of course, is omitted.

Instructions to Patients.—The patients are simply instructed to wash the scalp with soap and warm water from the fifteenth day after treatment until epilation is complete. A cotton cap is provided by the department, and the patients are advised to make another like it. The patient wears one of these caps while the other is sterilized by boiling on alternate days.

After-care.—Inspection is carried out by the clinic about three weeks later, and thereafter as is considered necessary. Local application of ung. adipis lanae is prescribed to soften

and facilitate the removal of any scabs or scales that may be present. The occurrence of secondary infection is treated on general principles, but these cases were few in this series, which indicates the high standard of the school medical organization in detecting cases at an early stage.

With the factors given above, epilation has always been on the whole satisfactory. Occasionally small tufts of hair have remained in the centre of a well-epilated area or towards the periphery of the scalp. In most cases the hairs are loose and can be easily removed by a pair of forceps. Sometimes, however, these tufts resist extraction, but since infection of these hairs is not present, as shown from the following results, recontamination of the growing hair never follows and they can be ignored. No complications result from therapy except occasional headache and vomiting on the night of treatment, and there were no cases of alopecia, local or general.

Review of Cases

To check the results of treatment carried out on the lines described above, follow-up cards were sent to 103 patients whose epilation dated from eight months and over requesting them to attend the x-ray department for review. These 103 cases comprised: 71 with a laboratory diagnosis of *Microsporon audouini*, 27 with a laboratory diagnosis of ringworm fungus, and 5 diagnosed on clinical grounds and by Wood's light.

Forty-eight of these patients responded in person and were examined by us clinically and by Wood's light. They all proved to be free from infection and their hair and scalp were in excellent condition. Of the remaining 55 patients, 13 had left London and could not be contacted, and 42 were examined at their schools by the courtesy of the medical officer of the S.E. and S.W. divisions, who kindly forwarded reports on the condition of these patients. All without exception were completely well and their hair and scalp were described as being in a healthy state.

From these figures it can be stated that out of 103 patients with ringworm of the scalp who received no treatment other than x-ray epilation 90 (87.37%) showed no signs of relapse after an interval of time ranging from eight to twenty-four months. These 90 were made up as follows: 68 cases of *M. audouini* infection, 19 of ringworm fungus, and 3 diagnosed clinically and by Wood's light. It should be added that as no complaints have been received concerning the other 13 cases it can be assumed on fairly certain grounds that they too have remained free from relapse. This being so, the total percentage of cures may have reached 100.

Time Lost from School.—To date it has been our policy to keep the children away from school for about two to two and a half months, when the new hair showed signs of regrowth. We feel that in view of the above results an earlier return is possible, as the loss of a full term is often a serious handicap to these children. Perhaps, with a good epilation, six weeks would be sufficient in the great majority. Further work will be necessary, however, before a final decision can be taken on this point.

Summary

One hundred and three cases of tinea capitis treated solely by x-ray epilation are reviewed after an interval of eight to twenty-four months.

The results show that local application of fungicides is unnecessary—at least in cases of *M. audouini* infection. It may be added that the fact that the cases were consecutive and were free after the lapse of such an interval is ample justification of the view of the late Mr. G. Stebbing, who held that local

treatment was unnecessary, and that although x rays were not parasitocidal they either had the power to reduce the vitality of the fungus or brought about some tissue change which made it less easy for chance spores remaining to contaminate the new crop of hair.

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FULMINATING MENINGOCOCCAL SEPTICAEMIA

AN ACCOUNT OF THREE CASES, WITH ONE RECOVERY

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Fulminating septicaemia is one of the rarer manifestations of meningococcal infection. It occurred in 24 (3.4%) of Banks's (1948) series of 706 cases, and American authors give its incidence as about 1% (Sweet, Dowling, and Howell, 1947).

Though it may be preceded by a few days of mild infection of the upper respiratory tract, the onset is usually sudden, with fever, rapid respirations, and cyanosis, simulating early pneumonia. Petechiae appear within a few hours, and quickly enlarge to form purpuric blotches. Peripheral vascular failure occurs early, with a rapid feeble pulse and very low blood pressure. Meningism is absent at first, but may appear terminally. In untreated cases death occurs in 24–36 hours. Necropsy often reveals adrenal lesions, the most striking of which is massive bilateral haemorrhagic destruction (sometimes known as the Waterhouse-Friderichsen syndrome).

Since 1940, reports of successful treatment with sulphonamides and adrenal cortical extract have been published. With the additional help of penicillin Banks (1948) believes 50% of cases may recover.

We saw three sporadic cases within a year at a general hospital. One of these recovered.

Case 1

A female laundry worker aged 21 was quite well till 2.30 a.m. on Jan. 27, 1946, when she awoke with pains in her legs, which grew rapidly worse and spread to her whole body. Her throat became sore, and during the morning dark blotches appeared on her trunk and limbs.

She was admitted to hospital at 3.30 p.m., and was seen to be a well-built woman, gravely ill. The temperature was 102° F. (38.9° C.), pulse 112, and respirations 24. Purpuric blotches involved the face, neck, trunk, and limbs, and also the buccal mucous membrane and conjunctivae. The pulse was rapid, feeble, and regular. Blood pressure was 75/55. There were no signs of meningism and the urine was normal. White blood cells totalled 15,000 (83% polymorphs). Bleeding and clotting times and capillary resistance were normal.

Her condition deteriorated rapidly, the pulse became imperceptible, and the blood pressure too low for estimation. She sank into a coma, and a trace of neck rigidity was noted. The pupils were irregular and the limbs flaccid. At 5.15 a.m. next day the cerebrospinal fluid was turbid. Cells numbered 13,000 (99% polymorphs). Gram-negative intracellular diplococci