FOUR DIFFERENT TYPES OF BLOOD SUGAR CURVE IN ONE PATIENT WITHIN SEVENTEEN MONTHS.

BY

F. J. G. LISHMAN, M.B., B.S.,
UNIVERSITY COLLEGE HOSPITAL.

THE following details appear to be of some pathological interest, and may also be of importance in connexion with life insurance of glycosuric subjects.

An obese butcher, aged 50, came under treatment in January, 1929, for osteo-arthritis of the knee- and ankle-joints; owing to the discovery of glycosuria on routine examination, a blood sugar examination was made (A). The curve was found to be normal, but indicated a low renal threshold of 0.123 per cent. sugar.

CURVE A.—January 28th, 1929.

CURVE B.—May 16th, 1930.

CURVE C.—May 26th, 1930.

CURVE D.—June 5th, 1930.

CURVE A.—Fasting blood sugar (not estimated). Glucose 40 grams by mouth. Blood sugar: 1/2 hour after, 0.108 per cent.; 1 hour after, 0.128 per cent.; 1 1/2 hours after, 0.095 per cent.; 2 hours after, 0.077 per cent. Urine: fasting, 0; 1/2 hour after glucose, 0; 1 hour after glucose, ++; 1 1/2 hours after glucose, +; 2 hours after glucose, +.

CURVE B.—Fasting blood sugar, 0.188 per cent. Glucose, 40 grams by mouth. Blood sugar: 1/2 hour after, 0.266 per cent.; 1 hour after, 0.304 per cent.; 1 1/2 hours after, 0.304 per cent.; 2 hours after, 0.272 per cent. Urine: fasting, ++; 1/2 hour after glucose, ++; 1 hour after glucose, ++; 1 1/2 hours after glucose, ++; 2 hours after glucose, ++.

CURVE C.—Fasting blood sugar, 0.096 per cent. Glucose, 50 grams by mouth. Blood sugar: 3/4 hour after, 0.14 per cent.; 1 1/2 hours after, 0.26 per cent.; 2 1/2 hours after, 0.16 per cent. Urine: fasting, sugar 0, acetone +; 3/4 hour after, sugar 0, acetone +; 1 1/2 hours after, sugar +, acetone trace; 2 1/2 hours after, sugar trace, acetone 0.

CURVE D.—Fasting blood sugar, 0.124 per cent. Glucose, 50 grams by mouth. Blood sugar: 1/2 hour after, 0.132 per cent.; 1 hour after, 0.24 per cent.; 1 1/2 hours after, 0.172 per cent.; 2 hours after, 0.12 per cent. Urine sugar: fasting, 0; 1/2 hour after, 0; 1 hour after, 0; 1 1/2 hours after, ++; 2 hours after, +.

(The figures at the base of the charts represent the time in hours after administration of glucose.)

The patient's teeth were extracted, and he was treated by radiant heat baths, and also by thyroid gland (dried) 1 gram daily till April, 1930. During eleven months of this period he lost weight slowly, presumably owing to the action of the thyroid; he then rapidly lost 3 st. in the course of four months, concurrently with the development of symptoms of thirst and polyuria, and the presence of increased quantities of sugar, together with ketone

bodies and albumin in the urine. This was so suggestive of diabetes mellitus that a second curve (B) was prepared after re-admission to hospital, the patient having been kept on a light diet, with restricted carbohydrate only, and without thyroid, for four days. This curve was typical of diabetes mellitus, but sugar was passed in the urine throughout.

The patient was put on a strict diabetic diet of approximately 1,000 calories containing 25 grams of carbohydrate, 58 grams of protein, and 75 grams of fat; the symptoms of thirst and polyuria then disappeared, and he became completely free from sugar in two days. Owing to the cessation of the glycosuria, suggesting that the renal threshold might now be higher, a third curve (C) was prepared to determine the threshold. This, while still being of the diabetic type, and not returning to normal within two hours, was suggestive of the "lag" type of curve; sugar was not passed until one and a half hours after the administration of the glucose, the blood sugar then being 0.21 per cent. The diet was increased to 1,500 calories (carbohydrate, 45 grams; protein, 78 grams; fat, 112 grams); the patient remained without symptoms, and the urine continued to be sugar-free, with only traces of albumin and ketone bodies. After another ten days' interval a final curve was made; this was definitely of the "lag" type. The patient had had no thyroid for twenty-seven days previously, was never given insulin, and was not of Jewish extraction. He had no complications of diabetes mellitus.

I am indebted to Dr. Batty Shaw for permission to publish this case, and to Dr. G. W. Goodhart and Dr. B. W. S. Mackenzie for the blood sugar estimations.

SUBSEQUENT HISTORY OF PATIENTS TREATED WITH A RESIDUAL ANTIGEN OF B. TUBERCULOSIS.

BY

C. E. JENKINS, M.R.C.S., L.R.C.P.,
PATHOLOGIST TO SALFORD ROYAL HOSPITAL.

It is probable that in no disease is the value of a remedy more dependent upon remote results than in pulmonary tuberculosis. A preliminary paper in which I described the preparation of the antigen and the immediate results obtained was published in 1928 in the July issue of the *British Journal of Tuberculosis*, and the present note deals with the after-history of the cases then described. At that time no patient was refused treatment because of the state of the disease; consequently, the records were not improved by the fate of these hopeless cases. It was desired to test the antigen thoroughly, and the only requirement was that there should be no doubt about the certainty of the diagnosis. The sputum was positive in 79 per cent.; the remaining patients had had positive sputa in the past, or had spent one or more periods in sanatoriums, and presented clinical signs and symptoms that were unquestionable.

Of 67 consecutive cases reported, 10 patients died during or shortly after the treatment, 12 were not improved and were classified as failures, and 45 were said to show definite clinical improvement after a course of treatment lasting three months. The assessment was made immediately the course finished, in every case by the clinician in charge of the patient, usually the private doctor. Care was taken that the present writer offered no opinion on a case. All these cases have now been traced after an interval of two to three years has elapsed, and the results are here set forth.

The original deaths and the original failures are added together, since such deaths are obviously part of the original failures; they form a group of patients numbering 22, of whom 2 had improved, 4 had not improved, 15 had died, and one was untraced. Thus the percentage of those improved was 9, and of those now alive 29.

The patients who were originally improved numbered 45; of these, 32 were found to be still improved after two or three years, 6 had not improved, 5 had died, and 2 could not be traced. The percentage of those improved was 74, and of those now alive 88.

These results support the original observation that the conditions requisite for success with antigenic treatment in pulmonary tuberculosis are the same as for antigenic treatment of any other disease. It is essential for success that the patient shall possess some reserve of resistance, although that factor may need the antigen to call it into operation.

The cases that originally did badly show deplorable results later, whereas those in which there was an immediate response now give far superior results. The difference is so marked that it can be used for purposes of prognosis; it seems reasonable to infer that a patient who does badly during and immediately after antigen treatment has a bad prognosis, whereas those who improve after the treatment have a much better chance of ultimate survival.

The after-history of the groups testifies to the accuracy of the original clinical work, and it is only just to record my deep obligation to all the Salford practitioners who sent patients and reported upon them.

The accuracy with which the groups were originally formed lends increased value to the clinical opinions given on the same cases now, but it is recognized that there is no agreement among clinicians as regards data useful for prognosis; so the percentage of those now alive has, therefore, been given, for at least there can be no question as to the living and the dead. It will be seen that the proportion of survival after two to three years is three times as high in the group that responded immediately to treatment. It may be added that in the case of the 32 patients who remain improved the benefit is such that 19 are at work without ill effect; the majority of the remainder are women doing housework, which is difficult to assess. In any future series the obviously hopeless cases would be refused treatment, and the results no doubt would show a higher proportion of success.

Attention was concentrated upon pulmonary tuberculosis because it constitutes the largest section of the disease, and has a bad prognosis as it is usually treated. Other forms of tuberculosis have been investigated, and it has been found that the most spectacular results were obtained in young adults with tuberculous enteritis but with no clinical evidence of pulmonary involvement. In this class the antigen rapidly brought down the temperature, and the patients usually gained 30 or 40 pounds in weight during the treatment; all clinical signs cleared up, and the patients remain apparently cured. The utility of the antigen is necessarily limited by the comparative rarity of the condition.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TUBERCULOUS ADENITIS WITH DERMAL BULLAE.

THE following case appears to be worthy of record in view of the unusual occurrence of tubercle bacilli.

A plumber, aged 41, was admitted to the West Riding Sanatorium on October 1st, 1929; he had been healthy until four years previously, when the illness commenced. A brother had died of pulmonary tuberculosis.

On the right side of the neck above the clavicle was a diffuse, fairly tense, tender, and fluctuating swelling; in the posterior part of this could be felt deeply some harder masses of obviously enlarged and matted cervical glands. There was in this region the scar of an old gland operation. The skin over the swelling was quite healthy, but below the angle of the jaw on each side was an ulcerated area similar to the ones to be described. The swelling had commenced a month before admission, but the ulceration was of much longer duration.

The left forearm and hand were swollen; the skin was extensively and irregularly involved in a sloughy, ulcerative condition, particularly in the interdigital clefts and on the back of the hand. On the forearm about the elbow were three clear-cut shallow ulcers, one to two inches in diameter, with a low granulating surface. Purulent subcuticular bullae had formed over the rest of the forearm; some of these had ruptured, leaving a sloughy base, this being apparently the early stage of the more clearly marked ulcers previously mentioned. The appearance was that of a pyogenic infection of the skin with little inflammatory reaction. Fresh pustules appeared, containing greenish pus and having no inflammatory areola, and these also underwent a similar breaking down. The arm was not examined radiologically, but there did not seem to be any involvement of the bones. This condition had commenced about four years before.

A similar condition commencing at the same time on the left hip had cleared up; more recently, two small ulcers in the region of the great trochanter had again appeared, but presented no special features. There was no indication of pulmonary tuber-

culosis, and the sputum, when obtained, was found to be negative for the tubercle bacillus.

Three days after admission the cervical swelling was explored in its lower part, and 34 c.cm. of thick, greenish pus with a foul odour were aspirated. A smear of this pus stained by Ziehl-Neelsen's method showed enormous numbers of typical tubercle bacilli and polymorphonuclear leucocytes, many of which contained clumps of the bacilli. Rather less than three weeks later 52 c.cm. of pus were withdrawn, and 8 c.cm. of Calot's fluid were injected. Three days later still the abscess was found to be very tense; the pus had suddenly made its way to the skin at two points close together in the upper part of the swelling, the appearance being as if two large deep-seated pustules had formed. Despite the aspiration of another 65 c.cm. of purulent fluid the abscess burst. This pointing and bursting took place with an entire absence of inflammatory reaction, which otherwise might have suggested a secondary infection of the abscess. Smears of pus from an unruptured pustule on the forearm also contained the tubercle bacillus, although in much smaller number than in the case of the pus from the cervical abscess.

The patient's general condition was poor from the outset; his temperature was high and swinging (100°-103°), with a pulse persistently over 110 at night, and he showed evidence of grave toxæmia. He gradually sank and died on December 7th.

This case seems to be of interest in three particulars.

1. The presence of the tubercle bacillus in the pus from the cervical abscess in such enormous numbers is very unusual; the organism is rarely to be found at all in the pus from a tuberculous abscess.

2. The rapid manner in which the abscess filled up and finally burst, with no preliminary warning changes in the skin, was surprising.

3. The extensive and atypical lesions on the forearm simulated a low-grade pyogenic infection; they were, however, proved to be tuberculous by the finding of the organism in the pus from an unruptured bulla. No doubt the lesions were later contaminated by pyogenic organisms, but the initial lesion would appear to have been tuberculous.

I am indebted to the medical superintendent, Dr. Thompson Campbell, for permission to report on this case.

R. C. HOLDERNESS, M.B., B.S. Lond.,
Assistant R.M.O., West Riding Sanatorium.

CONGENITAL UMBILICAL HERNIA OF LIVER AND BOWEL.

THE rarity of the following condition entitles it, perhaps, to publication.

A baby, two weeks premature, was brought to the Bradford Children's Hospital thirteen hours after normal birth; the mother had had two other healthy children. It appeared healthy and well developed, except that the recti muscles were separated for one and three-quarter inches at the umbilicus, through which there was an expansion of the base of the umbilical cord, forming a thin transparent sac about the size of an orange. The sac was very tense and elastic, and it was obvious that the contents consisted of at least two different structures; the larger appeared dark red and opaque, the smaller part being translucent. The umbilical cord was continuous from the lower aspect of the expansion as a normal cord.

Under chloroform and ether anaesthesia an attempt was made to reduce the contents of the sac, but this was unsuccessful; the part of the cord forming the wall of the sac was then incised, and the sac was opened. Part of the contents was found to consist of a dark red, almost spherical, mass with paler areas; it resembled liver substance and was about the size of a small orange. The wall of the sac was adherent to the mass along its mid-line on the anterior surface, and had to be dissected off. There was also small bowel in the sac, which was returned to the abdomen; the red mass was traced upwards and appeared to be continuous with the liver. Since the child's condition was poor, it was not considered advisable to explore further. Owing to the smallness of the orifice, compared with the hernia, the mass was with difficulty returned to the abdominal cavity. The excess of the sac and the cord were excised, and the abdomen was closed. The child only survived three and a half hours after the operation.

The mass was found to consist of liver representing more than half of that organ; at its extremity was the ligamentum teres. The line along which it had been dissected from the sac was its anterior peritoneal reflexion. On its lower surface was the gall-bladder, practically concealed in liver substance, and three-quarters of the bile duct. No other developmental abnormalities were found.

I am indebted to Mr. Gordon D. Latimer, assistant surgeon to the hospital, for permission to record the case.

Bradford.

KATHLEEN A. ALLISON, M.B., Ch.B.