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Medical Memoranda

Immediate Results of Treating Sun-Blindness with Carbachol Injections

The eclipse of the sun on June 30, 1954, was observable in the north-east of Scotland, and especially in Aberdeen, in perfect cloudless conditions. As a result, during the following few days many patients came with symptoms indicative of sun-blindness. A search for treatment in current and old literature was fruitless, and it was decided to aim at improving the retinal circulation by retrobulbar injections of carbachol, 0.25 mg.

Symptoms.—It was noted that: (a) The patients complained of difficulty in reading and in recognizing faces at a certain distance. In milder cases the complaint was of "letters jumping out." Less introspective patients described a general haze or central blurred spot. (b) The time spent on observing the eclipse, or the inadequacy of protective glasses, or both, had no constant bearing on subjective symptoms, but seemed to be more related to the observable changes at the macula. (c) The symptoms had little relation to the macular changes.

We confirmed the ophthalmoscopic changes as described by Elwyn (1946), but in many cases there was a bright diamond-like reflex at the macula surrounded by an area of exudation and hyperaemia.

Assessing the Injury.—All tests were carried out in a dark-room in standard lighting, allowing the patient about 15 minutes for adaptation. Visual acuity on Snellen's types was noted. The near vision was tested with Jaeger types. If patients experienced difficulty a record was made of the number of letters or words "falling out," of those only blurred, whether constantly or intermittently, and the character of scotomata (blackish, greyish, whitish). This method was found to be quicker and more accurate than using Amsler's (1953) charts.

Treatment.—After assessing the extent of functional damage and recording the ophthalmoscopic appearance a retrobulbar injection of carbachol, 0.25 mg., was given to one eye only. If there was no definite improvement on one of the previously described tests (Jaeger's types were generally used) the patient was classified as not responding to treatment. All responding patients were given daily treatment for two to three days.

Response to Treatment.—Table I shows the response of 55 patients to treatment with carbachol. The "immediate response" embraces those whose condition was clearly

TABLE I.—Response to Treatment with Carbachol

Day After Injury on which Treatment was Started	Immediate Response	Doubtful Reaction	No Response
1-7	28	4	9
8-14	2	—	1
15-21	5	1	1
22-28	4	—	—
Total ..	39	5	11

improved within 2 to 30 minutes after the injection. The immediate improvement was variable: in some cases from 6/36 to 6/12, from Jaeger 4 to Jaeger 1. Twenty-four hours after the single injection the patients could be classified into three categories: (a) further improved (which in early cases was rather to be expected); (b) improvement maintained; (c) a "backslide" to a condition somewhere midway between that of before and that after the last injection.

TABLE II.—Degree of Improvement in 39 Cases After One Course of Treatment

Days After Injury on which Treatment was Started	Recovered	Improved By		
		Snellen (More than 2 Lines) or Jaeger (More than 2 Type-sizes) or Scotoma Diminished by $\frac{1}{2}$	Snellen (1 to 2 Lines) or Jaeger (1 to 2 Type-sizes) or Scotoma Diminished by $\frac{1}{4}$	Less than Previous Standards
1-7	4	9	5	10
8-14	1	1	—	—
15-21	2	2	1	—
22-28	—	1	2	1
Total ..	7	13	8	11

No relation was found between the appearance of the macula and the patient's reaction to treatment.

Complications.—Carbachol caused no serious side-effects. It occasionally gave rise to excessive sweating, salivation, and slight nausea, or to diplopia and pain and throbbing in the head. Some patients developed blurred vision (even to less than 6/60). Ophthalmoscopically, oedema of the retina was found. All disturbances were transient.

CONCLUSION

In many instances in the present series, even in comparatively late cases, it was shown that symptoms of sun-blindness could be alleviated immediately by retrobulbar injections of carbachol.

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Neonatal Diabetes

Probably only 10 cases of neonatal diabetes have been reported (Schwartzman *et al.*, 1947). Until the peculiarities of the disease at this age are better understood, it is desirable that new cases should be reported as they occur.

CASE REPORT

On September 13, 1954, a month-old male child was admitted to hospital suffering from dehydration. He had been reluctant to feed for a few days and had vomited once. He weighed 5½ lb. (2.5 kg.) at birth, and had gained ½ lb. (225 g.) in the first two weeks, but had then been weaned on to artificial feeds. He weighed 6 lb. 4 oz. (2.8 kg.) at 3 weeks, but on admission weighed only 5 lb. (2.3 kg.).

Physical examination on admission revealed no abnormality apart from dehydration and weakness. The temperature was 99° F. (37.2° C.). Although clear indications were absent, infection was suspected and a course of chlorotetracycline was begun. The baby took his feeds well at first. The blood picture was normal, but sugar was found in the urine. On the morning of September 15 he vomited and became collapsed. Four blood-sugar estimations were carried out, with the following results: 12.45 p.m., 1,680 mg. per 100 ml.; 4.30 p.m., 1,980 mg.; 5.30 p.m., 1,620 mg.; and 9.30 p.m., 1,200 mg. The cerebrospinal fluid contained 1,200 mg. of glucose per 100 ml. Two specimens of urine contained more than 2% of sugar, with small amounts of acetone. Glucose was identified by fermentation and osazone tests and by chromatography.

After the first blood-sugar report, an intravenous dextrose-saline infusion (4% dextrose, 0.18% saline) was set up to run at 25 ml. an hour, and soluble insulin was given: 2 units at once, 4 units at 7 p.m., and 10 units at 11 p.m. The latter dose was repeated at 3 a.m., and at 7 a.m. the following day. The baby's condition had improved, but he then began to perspire freely, and at 10 a.m. a specimen of urine contained no sugar. No more insulin was given, and 5% dextrose was administered through the intravenous drip. At 11.30 a.m. sudden collapse and death occurred.

Post-mortem Findings.—The blood sugar estimated shortly after death was 325 mg. per 100 ml., and the urine

contained 0.2% of sugar, with no acetone. Macroscopical examination of the organs revealed no abnormality, apart from a few petechial haemorrhages in the lungs, some fatty change in the liver, and dilatation of the left renal calices. The right kidney was normal. Microscopical sections revealed glycogen in normal amounts in the liver. Sections of the brain, pituitary, pancreas, thyroid, suprarenals, heart, thymus, and spleen showed normal histology.

COMMENT

Schwartzman *et al.* (1947) collected from the world literature 57 cases of diabetes in infants under 1 year of age, 10 being under 1 month. The highest blood-sugar level reported was 952 mg. per 100 ml. Brodribb *et al.* (1952) reported a case of an infant aged 11 months whose blood-sugar level was 1,160 mg. per 100 ml., and stated that this was "the highest recorded under the age of 1 year." The figures obtained before death in the present case were all higher than this.

It is interesting to note the varying necropsy appearances of the islets of Langerhans in neonatal diabetes. Necropsies were carried out in six of the cases collected by Schwartzman *et al.* The islets were reported enlarged twice, reduced in number twice, scarred once, and normal once. The islets were normal in the present case.

My thanks are due to Dr. J. H. Gubbin for permission to publish this case, and to Dr. Gwendoline Barton for the pathological reports.

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Functional Recovery from Syphilitic Cirrhosis of Liver Following Penicillin and Bismuth Therapy

Late syphilis of the liver is now rarely encountered, and only two comprehensive reports of its treatment by penicillin have appeared in the literature (Tucker and Dexter, 1946; Nicol and Terry, 1951). The following case, which responded promptly to penicillin and bismuth, may therefore be of interest.

CASE REPORT

A single man aged 36 was involved in a mining accident in April, 1952. At routine medical examination four weeks later his liver and spleen were found to be enlarged. He was consequently referred to the Royal Infirmary, Sheffield, for investigation. He was pale and somewhat wasted. There was no clinical or historical evidence of icterus. The liver was three fingerbreadths enlarged below the costal margin and slightly tender, and its surface was smooth. The spleen was palpable one fingerbreadth below the costal margin and was not tender. There were no other significant physical findings. The Wassermann reaction and Kahn test were positive on two occasions. He admitted having been treated for gonorrhoea with sulphapyridine tablets at another hospital some twelve years previously.

On June 23, 1952, biochemical tests gave the following results: direct van den Bergh reaction, negative; serum bilirubin, less than 0.2 mg. per 100 ml.; serum alkaline phosphatase, 51 King-Armstrong units; thymol turbidity, 1.8 units; thymol flocculation, negative; Takata-Ara reaction, negative; total serum proteins, 7.7 g. per 100 ml. (albumin 5.1 g., globulin 2.6 g.).

Punch biopsy of the liver on June 23 showed an increase of fibrous tissue around the portal tracts, the fibrous bands being infiltrated with moderate numbers of fibroblasts and lymphocytes. A second biopsy on June 30 showed a portal type of cirrhosis of much milder degree than that present in the first biopsy specimen. Syphilis of the liver was tentatively diagnosed and a therapeutic test was started.

Antisymphilitic treatment on an ambulatory basis was begun on July 10, 1952, and was completed on February 11, 1954.

Between these dates he received 30 mega units of procaine penicillin G in oil with 2% aluminium monostearate and 8 g. of bismuth. Two weeks after starting treatment he complained of stabbing pains in the right hypochondrium. The liver was tender on palpation. On October 6, 1952, the liver was two fingerbreadths enlarged below the costal margin and the spleen was not palpable. He was putting on weight, and on February 16, 1953, he felt fit enough to take a light job in the mines.

On July 6 no clinical or radiological enlargement of the liver or spleen could be detected. On November 16, despite medical advice, he returned to work at the coal-face. Liver-function tests performed on October 26, 1953, and on August 27, 1954, were within normal limits.

Twenty-six months after beginning antisymphilitic treatment he looked very well, was working six days a week, and had been free from abdominal and right lower chest pains during the preceding ten months. There was no clinical or radiological evidence of hepatic or splenic enlargement and no biochemical evidence of hepatic dysfunction. His weight was satisfactory. The Wassermann reaction was positive and the Kahn test doubtful.

COMMENT

The prompt therapeutic response in this case supports the diagnosis of hepatic syphilis. Hahn (1943) states that the therapeutic test may be adjudged to be definitely positive only if there is a striking change in objective manifestations in direct temporal relationship to antisymphilitic treatment and if such change is maintained over a long observation period measured in months or preferably in years.

Although the liver biopsies were not conclusive of a syphilitic lesion in our case, this is in keeping with the finding of Nicol and Terry (1951), who commented on the limitations of liver biopsy. Their patient had an enlarged liver and spleen, with ascites. His blood Wassermann and Kahn reactions were positive on two occasions. Exploratory laparotomy was performed in order to exclude neoplasm. The liver was found to be grossly enlarged and to have the classical appearance of a hepar lobatum. A biopsy from the surface of one of the nodules revealed only regenerating liver tissue without evidence of granulomatous change. These authors were of the opinion that penicillin treatment of late syphilis of the liver would be effective only when gummatous lesions predominated.

Tucker and Dexter (1946) described a case of acquired late syphilis (gumma) of the liver and a case with multiple hepatic gummata due to congenital syphilis. In both instances the diagnosis was substantiated by therapeutic test (penicillin), and, in the congenital case, also by biopsy. They contended that penicillin was at least as effective in the treatment of visceral gummata as other forms of antisymphilitic treatment and that it offered the additional advantage of almost complete lack of toxicity, a factor of some importance when disease of the liver is present.

Our patient would appear to have made a clinical and biochemical recovery from his syphilitic cirrhosis. Bergenfeldt (1947) has demonstrated that apparently well-established cirrhosis following infective hepatitis can occasionally regress and complete recovery occur. The possibility that our patient might have been suffering from cirrhosis following infective hepatitis was considered, but the rapid response to antisymphilitic treatment would seem to be against this diagnosis.

I am indebted to Dr. H. P. Brody for his findings while the patient was under his care in the Royal Infirmary, Sheffield, and to Dr. H. Lederer, pathologist, Doncaster Royal Infirmary, for help and advice.

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