and touch were little affected. The calves were not unduly tender. There were no root pains. From a consideration of the Chinese cases alone, this might have been beriberi occurring during the course of tuberculous meningitis, in which disease early bladder symptoms are common; particularly as pyramidal release was never demonstrated. The fact, however, that a case occurred in a Sikh and a British soldier practically rules out this possibility. Lumbar punctures performed at various periods during the second week showed: spinal block, a yellowish fluid more green than is usual in Froin's syndrome, and an excess of cells, mainly lymphocytes, up to 500. The protein rose as high at 900 mg. per 100 ml. The tubercle bacillus was never found. In three cases radiology of the spine revealed no pathological change.

Period of Meningism.—This period lasted up to 10 days. It was associated with headache, and as this disappeared the patient became confused. Brudzinski's neck sign was usually not markedly present until well on in the second week—that is, after the spinal symptoms had been in evidence for some days.

PATHOLOGY

A full necropsy was performed on two cases; in two the brain and spinal cord alone were available. Both cases in which necropsy was made revealed subclinical fibroid phthisis without cavitation. The appearance of the spinal cord was characteristic. It looked as if a yellow jelly had been poured into the subarachnoid space and had been allowed to set, but that this had been incomplete in the lower cervical areas. A few tubercles could be found in the meninges of the cord. The brain showed typical small tubercles in the arachnoid, in which acid-fast bacilli were demonstrated. The fluid in the basal cistern was relatively clear. It contained considerably less protein and fewer cells. Section of the cord showed very little save peripheral commencing degeneration of myelin round the full circumference of the cord (ösmic acid) to the depth of about 2 mm.

COMMENT

This syndrome is recorded mainly because, though known to occur, its features are not referred to in standard works. On this account the first case caused considerable difficulty; in fact it was not diagnosed correctly until the necropsy. Since that time we have not seen an exactly similar case, though Dr. Purdon Martin recently had one at Queen Square, in which the cerebrospinal fluid findings early on tallied with the above. Dr. Greenfield, in discussing this case, remarked that in his experience when the cerebrospinal fluid protein was very high he has been unable to demonstrate tubercle bacilli. In view of the necropsy findings cisternal fluid might be more productive. It is worthy of comment that Lieut.-Col. J. M. Rogan, to whom our thanks are due, correctly diagnosed the British case during the period of the spinal phase from his knowledge of the Asiatic cases.

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Nicotinamide and Diabetes Mellitus

The water-soluble vitamins have been shown to play a part in enzyme systems involved in the oxidation and fermentation of glucose, and the beneficial action of yeast in the treatment of diabetes mellitus has been recognized for over 50 years. Dienst in 1939 reported the results of experiments on six human diabetics: his patients were given diets of known carbohydrate, protein, and fat content, and after stabilization and control over a period of several weeks the diets were supplemented with vitamin B (whole group) and ascorbic acid. He reported that the sugar tolerance in all cases was much improved thereby, and concluded that this was due to the action of thiamine and ascorbic acid. In 1937 Martin had shown that the existence of a multiple vitamin deficiency increased the insulin requirements of depancreatized dogs, but did not form any definite conclusion as to the precise role of the vitamins in treatment. Gaebler and Ciszewski (1945) fed three depancreatized dogs on a standard diet with added pancreatic enzymes and yeast. The minimal dose of insulin necessary to control glycosuria was inadequate when yeast was removed from the diet, and glycosuria was abolished after 12 days when the

ingestion of yeast was resumed. The effects of yeast could be produced with thiamine, riboflavine, nicotinic acid, inositol, pyridoxine, pantothenic acid, and para-aminobenzoic acid. In one animal no relation between the insulin requirements and the water-soluble vitamin intake could be demonstrated, and in the other two dogs thiamine, riboflavine, and nicotinic acid given together only delayed the onset of glycosuria. From this it may be concluded that although yeast prevents glycosuria in depancreatized dogs under the conditions of this experiment it is not possible to state which component of yeast is solely responsible. They were unable to confirm Dienst's view that an excess of ascorbic acid was beneficial in reducing the insulin requirements.

PRESENT INVESTIGATION

There is then some clinical and experimental evidence that yeast and the water-soluble vitamins can reduce the insulin requirements in human diabetics, but there still exists considerable doubt not only as to the active principle concerned but also as to its mode of action. The case described by Gordon in a recent letter of a male diabetic aged 40, not on insulin, who seemed to have his tolerance for sugar increased by large doses of nicotinamide (1,200 mg. daily for one month) is therefore of considerable interest in this connexion. We decided to investigate further the effect of nicotinamide on diabetics under control conditions in hospital. Accordingly six adult diabetics who were adequately stabilized without insulin on a fixed diet of 1,800 calories were chosen. They fell in the age group 40–65. Sugar tolerance estimation was performed after a few days' observation, and nicotinamide in a dose of 600 mg. t.i.d. was given by mouth for 14 days. Sugar tolerance estimation was repeated at the end of this period, and meanwhile daily blood sugar estimations had been performed. Surprisingly few side-reactions were observed from this large dose of nicotinamide, the most constant being a general feeling of warmth and occasional severe flushing and tingling of the skin, face, and extremities. In no case did the sugar tolerance curve improve on this therapy, and the daily blood sugar levels were consistently steady throughout. As an example, one case will be described in more detail.

CASE REPORT

This was a married woman aged 52, with no family history of diabetes, who had been a known diabetic for 12 months. She was admitted to the Manchester Royal Infirmary, under the care of Prof. T. H. Oliver, from the diabetic clinic. The sugar tolerance on July 4, 1946, was as follows:

Fasting blood sugar		216 mg. per 100 ml.
Blood sugar 1/2 hour after 50 g. glucose		310
" 1 " "		320
" 1½ hours		340
" 2 " "		310
" 2½ " "		255

Sugar was present in the urine throughout. She received 1,800 mg. nicotinamide daily for 14 days with only slight flushing of the face and occasional tingling of the hands and feet. A sugar-tolerance test was repeated on July 18, with the following result:

Fasting blood sugar		226 mg. per 100 ml.
Blood sugar 1/2 hour after 50 g. glucose		300
" 1 " "		335
" 1½ hours		365
" 2 " "		350
" 2½ " "		315

She has been seen on subsequent occasions in the out-patient clinic and there has been no change in her diabetic condition.

COMMENT

Although it is realized that the findings in six cases are inadequate for definite conclusions, there is no evidence that nicotinamide alone does influence the sugar tolerance or improve the diabetic condition.

I am indebted to Prof. T. H. Oliver for his help and co-operation.

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