Treatment consisted of infra-red radiation followed by interrupted galvanism to 11 individual facial muscles on the affected side. Treatment was given daily at first and later thrice weekly.

No significant advantage could be demonstrated from the use of galvanic stimulation for Bell's palsy.

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LAXATIVE EFFECT OF SORBITOL

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As sorbitol is now available commercially and is being used increasingly in food products, its metabolism and other physiological characteristics are of some importance. Apart from its value as a diabetic sugar it is useful in confectionery as a humectant and plastifier and for increasing the shelf life of the products. Its metabolism has been studied extensively and further work is in progress. In the course of this work it has been observed that, like other sugars of its kind, it exerts a laxative effect, particularly noticeable in large dosage. An attempt to define the threshold dose was made by Ellis and Krantz (1941), who found that by trial on 12 subjects the minimum dose to produce soft or watery stools was about 50 g. a day for the crystalline product and 20–30 g. a day for the 70% syrup (the crystalline compound being much superior in quality to the syrup).

In view of the small number of subjects previously used in these tests the results can hardly be regarded as representative for the general population. We therefore decided to apply tests to a larger number of volunteers to determine the effects at a specified dosage.

Method

Dosage Consideration.—A prerequisite of the tests was that they should not unduly affect the majority of subjects, but should indicate exceptional susceptibility if such should exist. A trial approach was made on three apparently normal subjects, one at a dosage of 50 g., and the other two at 25 g. Only the higher dosage showed spectacular results, and the test level chosen was therefore 25 g. a day.

Of the 101 volunteers taking part, 15 failed to complete the test for reasons unconnected with the effect of sorbitol. Control was obtained by the provision of a glucose solution with an addition of saccharin to match the sweetness of the sorbitol. The volunteers were accepted *en bloc* and no planned distribution of age group, sex, etc., was arranged.

The test consisted in taking 12.5 g. of either sorbitol or glucose after meals twice daily for seven days, half of the panel taking sorbitol and the other half glucose, and then changing over to the other substance for a second week. So far as the subjects were concerned, the solutions were identical in appearance, colour, and taste.

The solutions were: (1) a 50% w/v solution of glucose in water and (2) a 50% w/v solution of sorbitol in water to which was added 0.04% w/v of saccharin (based on the sorbitol content).

Each subject was given a supply of test solution sufficient for one week and invited to complete a questionary day by day. The 101 volunteers are accounted for as follows: completed tests both weeks, 84; tests not completed owing to alleged effects of sorbitol, 2; tests not completed for reasons not connected with sorbitol, 8; tests not started for personal reasons, 7.

Results

Analysis of the factors, such as rotation of dosage, method of dosage (as supplied or in a beverage, etc.), age group, occupation, marital status, and some others, not all of which are analysed in the accompanying Table, did not

Table of Results

Occupation	Status	Solution Used	Age Groups: Under 30 Sub.	Under 30 Mot.	Over 30 Sub.	Over 30 Mot.	Totals Sub.	Totals Mot.
Active	Single	Glucose	3	21	1	11	4	32
	,,	Sorbitol	3	21	1	9	4	30
	Married	Glucose	4	25	30	236	34	261
	,,	Sorbitol	4	23	30	262	34	285
Sedentary	Single	Glucose	12	94	2	13	14	107
	,,	Sorbitol	12	90	2	17	14	107
	Married	Glucose	7	48	25	223	32	271
	,,	Sorbitol	7	53	25	273	32	326
	Totals	Glucose	26	188	58	483	84	671
		Sorbitol	26	187	58	561	84	748

Sub.=Subjects. Mot.=Motions.

reveal any significant effects. In view of this the significant differences between sorbitol and glucose (standard deviation, 4.99 and 2.95 respectively; DF, 83) must be attributed to some other factor not disclosed in the group allocations.

By inspection three results were seen to be outstandingly divergent from the general run. A recalculation of standard deviation of the glucose and sorbitol series after eliminating these cases gave a standard deviation of 2.90 for glucose and 2.95 for sorbitol (DF, 80) indicating that the two series show no significant difference.

A fuller statistical analysis of the factors and interactions was found to be beyond our competence owing to the complications of disproportionate class numbers.

Inspection of the observations on "wind" showed a definite tendency to flatus due to sorbitol.

Comment

Olmsted (1953) commented on the results of Ellis and Krantz (1941) and suggested that sorbitol may be a physiological laxative in the sense that it is a substrate for the colonic bacterial populations. It has been shown, however, that, in general, sorbitol is a poor nutrient for the more common bacteria, and it seems more likely that its humectant properties are the cause of the laxation observed at higher dosages.

We conclude that sorbitol administered in a split daily dosage of 25 g. does not cause laxation in the general population, but specific reactions may be expected from about 5% of the subjects. In practice it has been noticed that the presence of fats in foodstuffs allows much larger doses to be tolerated without laxative effects. In view of the increasing use of this product in the confectionery trade, it might be well to bear in mind the possibility of a sorbitol sensitivity as a cause of diarrhoea in an otherwise healthy subject.

Summary

The laxative effect of sorbitol was compared with the control glucose at a dosage level of 25 g. a day for 86 subjects; observations included the number of motions, and incidence of wind and of discomfort or pain. Discomfort and marked laxation were experienced by five subjects, two of these failing to complete the test. The remainder showed no significant difference from the glucose control with the exception of a slight tendency to wind after ingesting sorbitol. No known diabetics were allowed to participate in the tests.

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Medical Memorandum

A.T.S. Cervical Polyradiculitis Treated by Cortisone

Neurological sequelae of serum therapy are well recognized. Miller and Stanton (1954) analysed the hundred adequately documented cases. Of these, 59 had brachial plexitis, 15 had other forms of radiculitis (radicular neuritis, mononeuritis, shoulder-girdle neuritis), 10 had polyneuritis, 6 had Landry's paralysis and myelitis, and 10 had cerebral and meningeal manifestations. Moynihan (1955) found that one patient developed peripheral neuritis in 7,580 cases given prophylactic A.T.S. (antitetanus serum).

These syndromes are severe complications. "Progress may be slow, and, while improvement in patients with plexus and single-nerve involvement may start in a month, complete recovery may be prolonged up to two years. According to most writers, about 20% of patients never achieve a complete return of function" (MacGibbon, 1955).

As these syndromes are believed to have an allergic basis, an anaphylactic hypersensitivity, and as cortisone has been successful in non-neurological drug-hypersensitivity states (Carey *et al.*, 1950) and in encephalomyelitis following antirabies vaccine (Garrison, 1952), it is important to assess the value of steroid therapy in serum neuritis.

Cortisone had no effect on peripheral neuropathy which developed after A.T.S. in a patient (Walsh, 1952), but here the cortisone was not given until the third day of muscular weakness, and then only 50 mg. intramuscularly twice daily for 10 days. However, Shulman *et al.* (1953) produced a complete remission in a case of A.T.S. sciatic neuritis with a single intravenous infusion of corticotrophin; and Shafer (1957), using oral prednisone, 5 mg. six-hourly, relieved the pain in a case of A.T.S. shoulder-girdle neuritis in one day, with return of muscle power to normal in 10 days.

CASE REPORT

A sergeant, aged 36, cut his right hand on March 22, 1957, The wound was sutured but became infected, and on March 29 he was given injections of A.T.S., 1,500 units, in his right arm, and of fortified procaine penicillin, 1 ml. twice daily, in his buttocks, on that and the next two days. On April 4 he noticed that his right arm was itching, swollen, and red. At 10.30 that night an aching pain began in the left side of his neck, and spread gradually down the back, into the calf, and from the left shoulder down the arm to the elbow. These pains became worse when he moved the shoulder or sat up. Although he felt quite well otherwise, these aches were severe enough to make him come for admission to the Royal Herbert Hospital, Woolwich, at 3.30 a.m. on April 5. The only significant features of the history were that he was left-handed, that he had had penicillin injections before with no ill effects, and had been given tetanus toxoid-antitoxin in 1937 and tetanus toxoid in 1938, 1939, 1942, and 1944.

On examination he was distressed and in obvious pain. His whole body with the exception of his head was covered with a fine erythematous eruption. He was afebrile, the scar on the right hand was soundly healed, and there was no swelling or tenderness at the sites of the injections. There were no other abnormal signs in the central nervous or any other system.

The haemoglobin, total and differential white-cell counts, and, later, *x*-ray films of the chest and cervical spine were normal. A diagnosis of serum sickness was made, and promethazine hydrochloride, 25 mg. six-hourly, was given.

By the following day (April 6) the rash had disappeared and the only pain was in the left upper limb, which he then noticed had become weak. There was no wasting or fasciculation, but tenderness of the muscles of the left upper arm was present and also profound weakness of the left pectoralis major, infraspinatus, deltoid, biceps, triceps, and brachioradialis, the flexors and extensors of the wrist and fingers, and the small muscles of the hand. The left supinator and biceps jerks were absent and that of the triceps was much reduced. There was impairment of superficial sensation over the radial side of the left lower forearm, the thumb, and index finger in the distribution of C 6 dermatome. It seemed clear that the patient had serum neuritis, with a unilateral cervical radiculitis involving the left C 5–8 and T 1 roots, especially C 6. He was given cortisone by mouth, beginning with 75 mg. six-hourly.

By the next morning (April 7) the aches were much less, and his power had improved remarkably both subjectively and objectively, while the sensory impairment was confined to a small area on the radial side of the left wrist and over the first metacarpal bone. The cortisone was decreased to 200 mg. that day, and the next morning he had some recurrence of pain in both shoulders. His power had continued to improve, and he was given 100 mg. of cortisone that day. On April 9 power and sensation were normal and his deep reflexes had all returned, though still reduced. The cortisone was continued at 100 mg. that day and then gradually tailed off over the next fortnight, so that he received a total of 1,175 mg. over 18 days.

On discharge from hospital on April 26 his only complaint was of slight ache over the left deltoid. One month later he was well and symptom-free; the only abnormal sign was a slightly decreased left biceps reflex.

COMMENT

In view of the unfavourable prognosis of serum neuritis it seems reasonable to attribute the rapid recovery in this patient and in those of Shulman *et al.* and Shafar to the use of cortisone, corticotrophin, and prednisone respectively. Such dramatic response lends support to the suggested "allergic" basis in this condition, and would suggest that early and sufficient steroid therapy is the most hopeful treatment available for serum neuritis. In the identical clinical picture of localized neuritis of the shoulder girdle or neuralgic amyotrophy (Spillane, 1943; Parsonage and Turner, 1948; Turner and Parsonage, 1957), when the miscellaneous precipitating factors include trauma and infection, it would seem worth while to attempt steroid therapy if it could be given as early as possible in the course of the disease.

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