In the present case the rapid development of the fibrous stricture of the pyloric antrum and the pyloric stenosis can be seen by comparison of the two barium-meal examinations done 16 days apart. This clearly excludes a congenital abnormality.

Summary

A case of pyloric stenosis and fibrous stricture of the pyloric antrum developing in under two months in a child after swallowing compound ferrous sulphate tablets is described. Death was due to acute suppurative peritonitis following jejunostomy.

The literature on ferrous sulphate poisoning and fibrous stricture of the stomach due to the ingestion of corrosive poisons is briefly reviewed.

My thanks are due to the physicians and surgeons under whose care the patient was at Hammersmith and Margate Hospitals for permission to publish the case, to Dr. J. Duncan White and Dr. J. P. Thierens for permission to use the radiographs, to Dr. Keith Simpson for his necropsy report, and to Mr. Basden for the reproductions of the radiographs.

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METHOD OF PREVENTING INSULIN ATROPHY

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Many theories have been put forward to explain the development of fat atrophy occurring at the site of injection of insulin in some diabetic patients, and in our opinion no better summary of these views has been given than that of Marble and Smith (1942).

During an extensive survey of 57 cases of insulin atrophy occurring in this clinic it occurred to us that, whatever the exact mechanism of its production, the high local concentration of insulin at the site of injection is probably a significant factor. Dispersal of this concentration seemed to be a logical step towards lessening or preventing such atrophy.

The use of hyaluronidase as a spreading agent suggested itself. The obvious danger was too rapid absorption of insulin into the blood stream, with consequent hypoglycaemia. Several stabilized diabetics in hospital, not showing insulin atrophy, were therefore given their usual doses of insulin with added hyaluronidase. No appreciable change was found to occur in their diabetic control. No hypoglycaemia was observed, whilst, on the other hand, there was no evidence that the insulin was rendered ineffective. In studying the control of

diabetics by the inunction of an insulin hyaluronidase mixture, Bresgen and Heinlein (1951) also found that the insulin was not inactivated.

Accordingly, in 1951 three children who showed marked atrophy at whatever site insulin had been given were chosen for a trial. They lived in a home for diabetic children attached to the National Children's Home at Frodsham, Cheshire, and their diabetic condition was under constant supervision by trained nursing staff. Areas in which insulin had not been previously given were chosen in each child for regular injections of an insulin-hyaluronidase mixture, and injections have since been confined to these new sites.

The insulin-hyaluronidase mixture was made daily by dissolving 3 mg. of hyaluronidase in 400 units of soluble insulin (80 units per ml.). From this mixture the individual doses were drawn up. This addition of hyaluronidase to insulin did not produce any alteration in their diabetic control, and injections of the mixture caused no more discomfort than had injections of insulin alone.

Case Reports

Case 1.—A girl born on December 3, 1938, had been a diabetic since 1944. She was first seen by us in September, 1950, when she showed insulin atrophy in both arms and both thighs. Her parents stated that the atrophy developed in the arms in about six months and in the thighs in about four and a half months after beginning insulin injections. Her diet contained 250 g. of carbohydrate daily up to May, 1952, since when she has had a "free diet." Injections of soluble insulin twice daily from September, 1950, to February, 1951, in the arms and thighs greatly increased the atrophy already present. Though she has had no more injections in the arms and thighs since February, 1951, the atrophy remains unchanged. From March 1, 1951, to January 27, 1953, the insulin-hyaluronidase mixture was given into the buttocks only. The total daily dose varied during this period from 72 to 88 units. No subcutaneous atrophy of the buttocks has developed from the use of this mixture.

Case 2.—A girl (born September 15, 1943) had been a diabetic since 1948, and was first seen by us in August, 1950, when she showed marked insulin atrophy of both arms and both buttocks. We were informed by her parents that insulin atrophy was "very bad" in the arms within about nine months of starting insulin injections. Her diet contained 160 g. of carbohydrate daily at first; it being increased to 235 g. at present. From March 1, 1951, to October 28, 1952, the insulin-hyaluronidase mixture was given into the anterior abdominal wall only. The total daily dose varied during this period from 64 to 68 units. No subcutaneous atrophy of the anterior abdominal wall has developed.

Case 3.—A boy (born September 4, 1941) developed diabetes mellitus in 1949, and was first seen by us in May, 1951, when insulin atrophy was present in both arms. At that time his diet contained 190 g. of carbohydrate daily, and this has gradually been increased to 250 g. daily. Injections of soluble insulin were given twice daily, into the left thigh only, from May 26 to November 20, 1951, the total daily dose varying between 84 and 45 units. Atrophy was then observed to have developed at this site. Since November 21, the insulin-hyaluronidase mixture has been given into the right thigh only. The total daily dose has varied between 48 and 56 units. The mixture has been used for 16 months up to March 20, 1953, and has produced no atrophy in the right thigh.

Discussion

It would seem from our observations in these three cases that the addition of hyaluronidase to insulin has prevented atrophy developing, whereas, with insulin alone, atrophy

had appeared in a few months in each case. The chief benefit from the use of this method, if its value is confirmed, would appear to lie in the alleviation of this unsightly effect of insulin therapy, which so commonly occurs in children and young women. Among 20 diabetic children at this home, insulin atrophy has occurred in 10 (50%).

There are, however, some practical points for consideration before the method can be applied to the routine outpatient treatment of diabetics. At present we believe that the insulin-hyaluronidase mixture must be freshly prepared each day, as its spreading action begins to diminish after eight hours. A more stable preparation would have obvious advantages. Further, it is probable that we have been using an excessive amount of hyaluronidase.

Summary

Three cases are described in which an insulin-hyaluronidase mixture has prevented the onset of insulin atrophy.

The practical difficulties in the giving and preparation of this mixture are discussed.

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Medical Memorandum

A Case of Friedländer's Pneumonia Treated with Aureomycin

The incidence of Friedländer's pneumonia has been estimated as 0.8 to 4% of all pneumonias. Rosenthal (1949) points out that these figures are probably too high, as it is only the severe pneumonias which are admitted to hospital.

Before the introduction of the sulphonamides the mortality was approximately 80%. With their advent it fell to 60%, only to rise again when they were gradually replaced by penicillin—which is almost completely ineffective against this organism—as the treatment for all types of pneumonia. Gill (1951) believes that penicillin may actually be harmful, stating that all his patients treated with penicillin alone died. In the days before any specific treatment was given, 20% recovered. He suggests that this may have been due to the penicillin killing susceptible organisms, thereby giving the Friedländer's bacillus a free field.

Streptomycin has proved more valuable than the sulphonamides, and some encouraging reports have been published (Barber and Grant, 1952). However, as this condition can become chronic, and as the dosage of streptomycin needed may be high, complications of treatment may arise. Furthermore, strains exist which are resistant to streptomycin, so that some other antibiotic may be necessary. This is a report of such a case, in which aureomycin proved effective.

CASE REPORT

On January 17, 1951, a married woman aged 40, who had previously enjoyed good health and who was seven months pregnant (para 8) developed a "severe chill." She was attended by her doctor, who diagnosed influenza, which was at that time epidemic in Dublin. On January 19 she had a spontaneous precipitate delivery in the toilet. The next day she was admitted to the Mater Nursing Home under my care, her doctor having found evidence of consolidation in the upper lobe of the left lung. On admission this finding was confirmed, and she was noted to be extremely dyspnoeic. She was given oxygen, and started on penicillin and streptomycin in heavy dosage. Twelve hours after admission the cyanosis was less, but she complained of intense chest pain, which was not completely relieved by morphine. She was now coughing sputum which resembled tomato sauce in consistency and colour.

On examination the whole left lung was found to be consolidated. Toxaemia was marked and restlessness was extreme. The nature of the sputum, the degree of toxaemia, and the complaint of intense pain suggested a diagnosis of Friedländer's pneumonia. Aureomycin, 500 mg. every six hours, was begun. Bacteriological examination of the sputum was not possible until January 22, when a culture gave the following results: "Organisms were present in scanty numbers only. A growth of Gram-negative bacilli of the Friedländer group was obtained. The sugar reactions were characteristic." These organisms were subsequently demonstrated to be resistant to penicillin and streptomycin, but sensitive to aureomycin. On the same date the white cell count was 14,000 (74% polymorphs).

During January 22 and 23 there was a slight improvement in the clinical condition. Toxaemia was less but the cyanosis was still pronounced. X-ray examination showed involvement of the whole left lung.

On the night of January 24 the patient, after a bout of coughing, complained of an empty feeling in the left chest. When seen a few hours later she was found to have a left pneumothorax.

On the morning of January 25 fluid was present in the left chest. Culture of this fluid showed a heavy growth of Gram-negative organisms of the Friedländer group. This organism displayed the same sensitivity characteristics as that isolated from the sputum. X-ray examination showed almost complete collapse of the left lung with a fluid level in the fifth space.

Oral aureomycin was continued. In addition, the pleural cavity was aspirated daily and 100 mg. of aureomycin (intravenous preparation) was injected intrapleurally. In spite of these measures the pus remained thin. An intercostal drain was then inserted and permanent underwater drainage was established (Mr. E. O'Malley).

Regular intrapleural aureomycin was continued for many weeks, without rendering the pleural fluid sterile. The lung displayed little inclination to expand, although the quantity of fluid in the chest was gradually diminishing. It was considered that gross pleural thickening had occurred, and that spontaneous expansion was unlikely. On March 14 Mr. M. D. Hickey was consulted and the patient transferred to Rialto Chest Hospital on March 19. Daily aspiration of the pleural cavity was continued until April 17, when decortication was performed by Mr. Hickey. The operation was followed by almost complete expansion of the lung, with the exception of a small pocket in the lower anterior chest. This pocket was aspirated repeatedly.

By the end of May the sputum had decreased in amount and it had become increasingly difficult to aspirate any fluid from the pocket. During this time physiotherapy was carried out in an effort to promote complete expansion. On May 30 4 oz. (110 ml.) of very offensive sputum was coughed up; in this way her empyema pocket was emptied through a bronchial fistula. The amount of sputum immediately fell to a trace, and further attempts at aspiration of the pleural cavity were negative.

She seemed now to have achieved good expansion, although there was radiological obliteration of her left base, due to pleural thickening. Her general condition was excellent, and she was discharged from hospital on June 20.

When last seen (April, 1952), aeration of the left lower lobe seemed complete. She felt very well and had resumed her household duties.

I wish to record my thanks to Mr. M. D. Hickey and the other members of the staff of Rialto Chest Hospital, Dublin, for their assistance in the management of this case.

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