Case 12.—A mild case, with six weeks' history. Sulphur bath treatment for two weeks. Treated by chlorine gas on November 28th and 29th, 1916, and again on December 2nd and 3rd. Cured on December 7th. Wrote on December 21st saying he was still free of disease.

Case 13.—Hands, arms, trunk, and legs affected. One week's history with rapid spread of the infection. Treated by chlorine gas on December 7th, 8th, and 12th. On December 16th the patient was free of scabies.

Case 14.—Hands, arms, trunk, and legs affected. Ten weeks' history. No previous treatment. Treated by chlorine gas in December, 1916. On December 27th there was no irritation, but apparently scabies lesions were still present.

It is only possible to surmise as to the active agent in the cure. The toxic properties of chlorine are well known, and no doubt the acarid is affected by the gas diffusing into the burrows.

It seems possible, however, that the action may be prolonged by the combination of the chlorine with the outer layer of the skin and its gradual liberation as hydrochloric acid, since it is well known that proteins form such unstable compounds. In addition to the chlorine the hydrochloric acid may thus play a part in killing the acarid or its eggs.

It is generally held that the efficacy of the sulphur bath treatment is due to the formation of sulphuric acid and by oxidation of the sulphur; and this view would be in accord with the above supposition.

The treatment is perhaps a little too difficult to carry out in civilian life without special apparatus and a "gassing" room. For army purposes, however, where respirators are supplied which protect against the concentration of chlorine used it may be valuable because it is ambulatory, no special hospital accommodation being required as in the treatment of sulphur ointment.

We should like to express our thanks to Major J. S. Morrow, R.A.M.C., of the Queen Alexandra Military Hospital, for making an independent examination of the officers, and to Drs. Shelswell and Harrison, of Holborn Military Hospital, Mitcham, for examining and reporting on the non-commissioned officers and men.

Since writing the above, our attention has been drawn to a striking instance showing the efficacy of the method for preventing the spread of scabies in a unit. Numerous cases of scabies were occurring in a mounted section which was sleeping in temporary barracks. They were all passed through a considerable concentration of gas in a state of nudity, helmets being fastened round their necks with towels. The gassing was carried out in their sleeping quarters, all their clothes and bedding being treated at the same time. The medical officer has reported that no further case of scabies occurred for more than two months thereafter.

ANAPHYLACTIC SHOCK AFTER INJECTION OF SERUM INTRAVENOUSLY.

By C. ADAM PATRICK, M.D.,
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THE intravenous method of injecting serum causes the patient so much less discomfort than injection into the subcutaneous tissues, and has so many other advantages, that the record of three cases in which anaphylactic shock occurred may be of interest. After a rabbit or a guinea-pig has been sensitized by an injection of serum, it is sometimes possible to kill it within a few minutes by giving it a second subcutaneous dose. In man, however, the anaphylactic symptoms which may follow a second injection of serum under the skin are rarely dangerous, and consist usually in an accelerated and exaggerated attack of serum sickness; but intravenous injection may have alarming consequences. The following are notes of three such in a series of cases of dysentery.

CASE I.

W. P., aged 24. Admitted to hospital on July 24th, 1916, with symptoms of dysentery—frequent stools of blood and mucus. Temperature 100°–102° F. *B. dysenteriae* (Shiga) was grown from faeces on the day of admission. He did not improve on the treatment he was receiving, so antidysentery serum was injected intravenously as follows: On July 30th, 25 c.cm.; on July 31st, 20 c.cm. (patient rather better); on August 1st, 20 c.cm.; on August 2nd, 20 c.cm. (patient considerably improved); on August 5th, 20 c.cm.

About one and a half minutes after the last injection the patient experienced sudden pain over the heart; went pale, and felt faint. This gave him a great fright, but he felt all right again within a few minutes. A serum rash was out all over the body by the following day. His convalescence was rapid.

CASE II.

A. D. J., aged 25. Admitted to hospital on September 15th, 1916, and died on September 17th. The patient was very ill and thin. His illness had begun on August 14th, and in the course of treatment he had received one injection of antidysentery serum on August 22nd. Diarrhoea had rather diminished before admission, but became severe again on the 16th, when the stools consisted chiefly of mucus. Bacteriological examination was negative. As he was very ill indeed on the night of the 16th, it was decided to give him intravenous saline, and the opportunity was taken to give serum along with it. The sequence of events is here tabulated:

11.20 p.m. Injection of normal saline begun.

11.25. Antidysentery serum 25 c.cm. added to saline in container after about 250 c.cm. of normal saline had been run in. The injection meanwhile was going on.

11.28. Patient complained of pain across the front of the chest, then became restless, stretched out his arms, and had wide-staring eyes. He probably lost consciousness for a few seconds. The heart sounds remained steady, and there was no sign of cardiac dilatation. Injection stopped.

11.33. The whole condition had passed off. Injection of saline containing serum resumed.

11.40. An urticarial rash began to appear on the arm, apparently along the line of the vein into which the fluid was being injected. Within a few minutes urticarial patches had appeared also on the forearms, hands, and the upper part of the trunk. They were not observed elsewhere.

11.55. Injection stopped, the patient having had 1,200 c.cm., and being distinctly improved.

12 midnight. All traces of urticaria had disappeared.

The improvement was temporary. The patient vomited a good deal during the night, and died the next day.

Post mortem, there was found acute dysenteric inflammation of the great intestine, with much thickening, and haemorrhage into the mucous membrane. Only two inconsiderable ulcers were present. The stomach was much distended, and contained a large amount of greenish-brown fluid. There was great dilatation of the duodenum, which had a diameter equal to that of a normal stomach.

CASE III.

B. G., aged 28. Admitted to hospital on September 23rd, 1916, with gunshot wounds of the right thigh and a deep gunshot wound of the right ankle. The notes of his case had been lost in transit. After admission he was found to be suffering also from dysenteric symptoms, and *B. dysenteriae* (Shiga) was grown from a stool on September 25th. The temperature was high (103°), and he had very frequent motions. Within the next few days he became very thin, had a dry brown tongue, and spoke with difficulty. The condition of his wounds was unsatisfactory. On September 3rd intravenous saline was given at 2 p.m.; 50 c.cm. of antidysentery serum was put in the container along with the saline before the injection was begun. When not more than 50 c.cm. of the mixed fluid had been run into the vein the patient suddenly became very ill, with eyes staring and arms stretched out. His face was pale, and he had become unconscious. Breathing stopped for about thirty seconds. Within a few minutes he looked quieter, but he remained unconscious for about two hours, with a rapid pulse. In the evening he improved, and was able to answer questions. No rash was seen. He had a restless night, but was rather better in the morning. At 11 a.m. 1,100 c.cm. of saline solution, without serum, was given, without abnormal symptoms. There was a transient improvement, but he died next morning. *Post mortem*, there was a well marked dysenteric condition of the colon, with a few shallow ulcers.

These three were the only cases to show unusual symptoms among a large number, not all cases of dysentery, in which either serum, or saline solution, or both together, were injected intravenously. The possibility of the entrance of air along with the fluid can be excluded. In Case I no serum injections had ever been given previously, and though it is unusual for sensitization to occur while the injections are being continued, and especially within six days of the first, I do not see how the symptoms can be explained otherwise than as due to anaphylactic shock, especially in view of the two other cases. In Case II antidysentery serum had been given subcutaneously twenty-six days before. The rapid appearance and disappearance of urticaria is of interest, and especially its appearing first near the site of injection. This corresponds to what is found in cases of serum sickness, where frequently the rash is first seen round the site of puncture. The absence of further symptoms when the injection was resumed is what one would have expected. The dilatation of stomach and duodenum was probably not due to anaphylaxis. In Case III there can be no doubt that the patient

had received a routine injection of antitetanus serum after being wounded, though this was overlooked at the time.

The most striking points about the cases are the rapidity with which the phenomena followed the injection of serum and the occurrence of severe pain in the chest as one of the first symptoms. Overfilling of the right side of the heart, such as might be caused by the too rapid injection of fluid into a vein, will produce precordial discomfort rather than pain. In Cases II and III the injection was not unduly rapid, and in Case I, from a mechanical point of view, the amount of fluid which entered the vein was negligible.

GRAVE DIABETES MELLITUS WITH PULMONARY TUBERCULOSIS FOLLOWING MUMPS.

BY

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As few cases of this sequence of events appear to be on record, the publication of these notes is perhaps justified.

The patient was a boy in the Royal Navy, aged 16½, undergoing training in a harbour ship. In May, 1916, he had an attack of mumps without any testicular or abdominal symptoms. On the third or fourth day of the disease the other boys in the ward started to tease him on account of his thirst (and remonstrated with him for drinking their lemonade). This drew his attention to the quantity of fluid he was drinking, but, independently of this, he noticed that he was passing urine three or four times during the night, which he had never done before. When first seen in Plymouth Hospital he had well marked symptoms of diabetes mellitus, with physical signs pointing to implication of both lungs with tuberculosis. On a dietary consisting of four ounces of bread and including green vegetables, but no other carbohydrate, ninety ounces of urine were being passed daily, with a total glucose output of seven ounces. The ferric chloride test for diacetic acid was markedly positive. On an initial starvation diet, with subsequent addition of carbohydrates to his fare, the patient's diabetic symptoms disappeared, except for the occasional appearance of slight quantities of sugar in the urine; calcium oxalate crystals could always be found. The disappearance of the glycosuria may be correlated with the presence of rapidly advancing tuberculosis of both lungs and with persistent evening rise of temperature to 101.5° to 102° F. The patient died five months after the attack of mumps.

NOTES BY H. S. HOLDEN, M.Sc.

Post-mortem Examination.

The left lung showed old extensive adhesions. The right was similar and, in addition, firmly adherent to the diaphragm. Both were very collapsed and showed massive lobar caseation, with breaking down at the apices. The mesenteric glands exhibited extensive tuberculosis, parts of the mesentery resembling bunches of grapes. There were a few tuberculous ulcers in the stomach, one about the size of a pea on the anterior surface of the pyloric end. The intestines showed a certain amount of tuberculous ulceration in all portions, this being most marked towards the lower end of the ileum. The liver showed slight fatty change.

Heart, kidneys, spleen, and brain were normal.

The pancreas was normal in appearance and weight (80 grams), but slightly soft in consistency. No anatomical peculiarity was found in the relations of its ducts.

Microscopic Examination of the Pancreas.—Sections were prepared from the head, body, and the tail of the gland, but those from the first two of these revealed little abnormality apart from a relatively slight round-celled infiltration in the more superficial portions. The sections from the tail, however, were of considerable interest, as, in addition to the infiltration, some of the islands of Langerhans showed evident hyaline degeneration, first described by Opie.¹ The affected islands were relatively scanty, although some of the remainder appeared to show slight signs of a similar condition.

REMARKS.

Abdominal symptoms have been but rarely described in mumps. In the course of an epidemic of thirty-three cases of mumps described by Edgecombe,² five of the subjects were affected by symptoms pointing very definitely to an implication of the pancreas in the disorder. Other writers have noticed the same train of symptoms occurring in the course of epidemics, and Morley Fletcher,³ summing up their evidence, states that severe abdominal pain starts within a week of the onset of mumps—usually the fourth

or fifth day—and is accompanied by vomiting and diarrhoea. The pain is usually epigastric, and tenderness above the umbilicus, with the presence of swelling or a diffuse resistance, can often be made out. The temperature hardly ever rises above 102° F., and the pulse-rate is not generally increased, and is frequently slowed. The immediate prognosis is good, and the patient is usually free from abdominal symptoms within the week. The same writer goes on to say, "some cases of diabetes may date their origin from inflammatory changes brought about in the pancreas by an attack." In favour of this cautious new opinion he quotes Barbieri's case of transient glycosuria in a boy of 6 years of age, in which the glycosuria followed mumps, but sugar disappeared from the urine in twenty-five days. Harris⁴ reported the onset of diabetes with acetoneuria in a man aged 42 years, the symptoms being noticed one month after mumps.

When it is remembered that the islands of Langerhans are found in relatively small numbers in the head and body of the gland as compared with the tail, it seems probable that the disturbance of the islands in the tail, described above, is enough to prove this to be a case of diabetes of pancreatic origin. In several recorded fatal cases of diabetes in which hyaline degeneration was present the number of islands affected was small and no other lesion which could have accounted for the symptoms was found. Very little evidence of previous inflammatory mischief was found in the gland in this case, which fits in with the clinical history, where no abdominal symptoms were noted. I can find no evidence in the literature of similar coincident changes occurring in the pancreas during an attack of mumps, as the clinical histories and *post-mortem* findings always pointed to an acute or subacute inflammation of the organ having taken place.

Owing to the severe nervous strain imposed by war it might naturally have been expected that diabetes, which has been experimentally shown to be associated with hyperactivity of the chromaffin system, would have become more frequent. From a careful analysis of the numbers of cases of diabetes treated at the Royal Naval Hospital, Plymouth, from 1911 to June, 1916, this expectation is justified. Out of 9,127 cases admitted to this hospital during 1911, 1912, and 1913 there were 5 cases of diabetes, or 0.05 per cent.; whereas out of 7,968 cases admitted during 1914, 1915, and up to June, 1916, there were 22 cases of diabetes, or 0.27 per cent. Assuming that the navy increased from 150,000 men in peace time to 350,000 in June, 1916, and has thus increased slightly more than twofold, the number of cases of diabetes admitted to Plymouth has increased fivefold.

I have to thank Fleet Surgeon R. St. G. Bond, Royal Navy, for his permission to publish this case, which occurred in one of his wards.

REFERENCES.

¹ Opie, *Disease of the Pancreas*, second edition, p. 312. ² Edgecombe, *Practitioner*, 1908, lxxx, p. 194. ³ H. Morley Fletcher, in Garrod, Batten, and Thursfield's *Diseases of Children*, p. 1056. ⁴ H. F. Harris, *Boston Medical and Surgical Journal*, 1899, cxi, pp. 465-469.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE TREATMENT OF DYSENTERY, WOUNDS, ETC., BY A COMBINATION OF INTERNAL ANTISEPTICS.

MAY I to bring to notice a mode of treatment the result of twenty-five years' experience in the Persian Gulf and India, where dysentery is endemic during certain seasons of the year? The patient is given a rectal injection of powdered ipecacuanha gr. xxx with m xx to xxx of tincture of opium every morning, and is placed on a mixture of carbolic acid and quinine. The nauseating and depressing effects of ipecacuanha given by the mouth are thus avoided, and the combination of carbolic acid and quinine, with its intensive bactericidal action, circulating through the site of ulceration, soon produces a development of new capillaries (as shown by the appearance of streaks of bright blood in the ejecta), together with the throwing off of the old sloughs. This beginning of improvement appears about the tenth day of treatment, and proceeds to the entire healing of the lesion. It is as