Some years ago I published (Taylor, 1920a) a paper in which I recorded some cases showing the apparent connexion between herpes and chicken-pox. In a subsequent paper (Taylor, 1920b) I returned to the subject, and reference is there made to several cases communicated to me by the medical men who had observed them. In the years that have since passed I have had several experiences confirming the close association of the two diseases, and I have been impressed by the fact that very often isolated vesicles quite indistinguishable from those of chicken-pox will be found in different parts of the body in patients suffering from herpes. It was no doubt an extreme case of this nature which justified Dr. Le Feuvre in describing the third class of these cases—herpes and chicken-pox occurring simultaneously in the same patient.

There certainly seems to be a strong case for adopting Dr. Le Feuvre's suggestion for making herpes a notifiable disease.

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RAT-BITE FEVER DUE TO CAT-BITE
SATISFACTORY RESPONSE TO PENICILLIN AFTER
FAILURE OF ARSENOTHERAPY

BY

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Rat-bite fever (sodoku), though common in some parts of the world, is a rarity in this country; even when cases occur here they are less likely to result from the bite of a rat than from that of another animal, most often the cat. The following report of a case of cat-bite fever is thought worthy of record, especially as it presented some striking, though less generally stressed, clinical features, and was cured by penicillin after the repeated failure of arsenotherapy.

Case Report

First Admission.—A lieutenant in the Royal Engineers, aged 36, was admitted to the Royal Masonic Hospital on Jan. 2, 1945, complaining of intermittent feverishness since Dec. 24, 1944. His history included one attack of benign tertian malaria in 1935 and two attacks of sandfly fever in 1940 and 1944 while in the Middle East.

During the first week of Dec., 1944, while in Taunton, he was bitten on the middle finger of the left hand by a kitten. The wound bled somewhat, and he applied a strong solution of iodine within a short time. Some desquamation followed, which he attributed to the iodine, but within four or five days the wound had healed completely. On Dec. 24 he suddenly began to feel very tired and generally unwell. The finger became painful and inflamed, and he complained of soreness over the left side of his chest, with pain in the left axilla and supraclavicular region; temperature over 100° F. He took to bed. Next day the temperature had fallen to normal by noon, but his appetite had gone, and by the evening

an exacerbation of symptoms, with a rise of temperature to 103° F. and pain in the upper jaw, associated with some swelling of the gum around an upper molar. By Jan. 1 his condition had further deteriorated and some blood was observed in the sputum. A few scattered rales were heard over both lungs posteriorly. Next day he was sent into the Royal Masonic Hospital with the tentative diagnosis of pleurisy.

On examination the patient looked ill; his face was flushed and he perspired profusely. There were several roughly circular reddened urticarial patches, averaging 2 to 3 cm. in diameter, scattered irregularly over the body, mostly on the neck and shoulders, with a few on the forehead, trunk, and extremities. They blanched on pressure and showed slight central vesiculation. An enlarged tender lymph node was palpable in the left axilla, and there were also a smaller left epitrochlear and a left supraclavicular node. The fauces and posterior pharyngeal wall were somewhat reddened; the tongue was clean and moist. Apart from tenderness in the left pectoral muscles the chest presented no abnormalities, and the cardiovascular system was not abnormal. The spleen was felt two finger-breadths below the costal margin; it was not tender. The C.N.S. presented no abnormal signs. The healed cat-bite could be seen; it did not appear to be inflamed.

Investigations.—Chest radiographs: No lesion seen. Blood count: Erythrocytes, 4.5 millions per c.mm.; Hb, 87%; C.I., 0.96; mean cell diameter, 7.17 μ ; leucocytes, 5,000 per c.mm.—neutrophils 2,950, eosinophils 100, basophils 0, lymphocytes 1,750, monocytes 200. No malaria parasites or pigment seen. Urinalysis: Sp. gr. 1010, reaction acid, no albumin or sugar; trace of acetone. Blood cultures taken on Jan. 3, 6, and 12 grew no organisms after seven days' incubation. Cultures from skin lesions grew only *Staph. albus*. Stool negative. Blood W.R. negative. Routine agglutinations to enteric and dysentery organisms, and to *Brucella*, within normal limits.

The course of the fever is adequately shown in the accompanying chart. During the febrile periods there was an exacerbation of symptoms, with anorexia, nausea, and increased prominence of the skin lesions. On the fourth day after admission he had a rigor, and tepid sponging became necessary next day because of a rise of temperature to 105° F. With the recurrence of fever on the 10th day after admission stiffness occurred in the arms and legs, which felt as though they were swollen, though no swelling was detectable. This symptom persisted for many days. Examination of the patient at this time revealed a picture similar to that on admission, except that the spleen was no longer palpable and the lymph nodes were smaller and not tender. Blood examination for spirilla (direct film) while the temperature was elevated (16th day) was negative. During the next febrile period blood was inoculated into some mice, while scrapings from the skin lesions were inoculated into others; about a week later the mouse blood contained organisms morphologically indistinguishable from *Spirillum minus* (Carter). Neoarsphenamine, 0.45 g., was then given intravenously; next day the temperature fell to normal, accompanied by profuse sweating, nausea (with vomiting on one occasion), and a widespread macular rash on the trunk and arms. This last had the general appearance of a drug eruption, and was presumed to be due to the arsenic.

The patient remained afebrile for the next 15 days. He felt rather unwell for two days after the arsenic injection, but soon became symptom-free, while the drug rash and the specific skin lesions rapidly disappeared. On Feb. 12, however, the temperature began to rise again; symptoms were slight, and included some

he felt chilly, tired, and depressed. His condition remained more or less unchanged until Dec. 27, when his temperature rose to 103° F. and his doctor was called in. In addition to headache, pain in the left chest, and cough, there were rhonchi at both lung bases, with a pleural rub at the angle of the left scapula. On Dec. 30, though he felt no better, his temperature had fallen to normal and his chest was practically free from physical signs, but a macular non-pruritic rash had appeared. On the 31st there was

tenderness of the muscles of the right arm. A prominent skin lesion appeared on the forehead at the site of a previous lesion. An intravenous injection of 0.6 g. neoarsphenamine was given on Feb. 13, and by Feb. 14 the temperature had returned to normal, after only a mild reaction to the arsenical. The skin lesion was now fading. He remained afebrile until discharge on Feb. 24, having had a further 0.6 g. of neoarsphenamine on Feb. 21 (mild reaction only).

On March 9 he appeared quite well, but stated that he had been having attacks of paroxysmal tachycardia, especially at night, each lasting about an hour. His pulse was 110.

Second Admission.—On March 14 the patient was readmitted, complaining of pain, stiffness, and swelling in his right arm of four days' duration. The first symptom noticed was tenderness of the muscles, beginning with the right biceps but later spreading to the forearm and shoulder muscles. This was followed shortly by increasing swelling of the muscles, with accompanying pain and stiffness. On examination he did not look ill, but his face was flushed and his skin hot and moist. There was marked brawny swelling of the right forearm and arm, most pronounced in the biceps region. The whole arm was very tender, and movement of the limb caused great pain. There was some tenderness, though very little swelling, of the shoulder muscles. A blood count on March 15 revealed 11,000 leucocytes per c.mm.—neutrophils 8,910, eosinophils 110, basophils 0, lymphocytes 1,430, and monocytes 550; Hb 87%.

Neosarsphenamine, 0.6 g., was given intravenously on March 15 and the temperature rose to 101.2° F., but next day it had fallen to normal and remained so. The swelling of the right arm subsided rapidly; by March 19 it had disappeared, and movements of the whole limb were free and unaccompanied by pain, but there was still a little tenderness on deep pressure over the biceps. Further injections of neosarsphenamine, 0.6 g., were given on March 21, 26, and April 3. With the help of ferrous sulphate, 3 gr. t.i.d., and ascorbic acid, 50 mg. b.d., his haemoglobin had risen to 100% by April 5. He was discharged on April 6, apparently in good order.

He was seen as an out-patient on April 18. In the previous three days there had been some return of myositis in the right biceps, the right quadriceps femoris, and both gastrocnemii. There was not much pain or swelling, and constitutional symptoms were absent. Neosarsphenamine, 0.6 g., was injected intravenously. On April 25 he was seen again and felt quite well. The myositis had disappeared within a day or two of the injection. Another intravenous injection of 0.6 g. neosarsphenamine was given, and a week later (May 2) a final one of 0.6 g. He claimed to be feeling perfectly well.

Third Admission.—On May 22 he was readmitted with pain in the left calf, both thighs, and the left posterior cervical triangle, gradually increasing over the past eight days. Since May 18 he had noticed increasing swelling in the right thigh and the lower part of the left calf. He had had severe headache and had observed tachycardia. On examination he looked rather unwell. Both thighs were tender to palpation, with firm diffuse swelling on the right side. There was a firm tender swelling of the lower end of the left calf. The arms were unaffected. There was also a similar swelling in the left posterior cervical triangle. No other abnormalities were detected. Blood count: Hb, 108%; leucocytes, 7,000 per c.mm.—neutrophils 5,740, eosinophils 140, basophils 0, lymphocytes 840, monocytes 280.

On this occasion he was treated with penicillin, 15,000 Oxford units three-hourly by intramuscular injection for five days (total, 600,000 units). The temperature on admission was 100.8° F., and it rose next day (after starting penicillin therapy) to 104° F., but within 24 hours it had fallen to normal and remained so. The myositis subsided rapidly, and within four days he was feeling perfectly well.

Discussion

Many of the manifestations of this case conformed more or less to the classical picture and need no further comment. Attention, however, may be drawn to certain less generally recognized features. Thus, the comparative lack of inflammatory changes at the site of the original bite is at variance with the usual description, most authors emphasizing the severity of these changes, as also the attending lymphangitis. It is stated, too, that the inflammation is apt to relapse and remit with the fever, but in the present case, though there was some slight initial inflammation, this soon subsided and did not recur. Splenomegaly is not generally described as occurring in this disease; it was only transitory in this case and, as a matter of fact, led to some confusion in the diagnosis. But by far the most aberrant and striking feature was the severe and recurrent myositis. Whether this is really a rare accompaniment of the disease I am not in a position to state, but there can be no doubt that observers are unfamiliar with it. Beaumont and Gill (1935) seem to be the first to describe this myositis. In their case the patient was a 9-year-old girl who developed oval tender masses in various muscles, but at no time was the myositis so severe as in my patient on his second admission. Almost as remarkable as the myositis was the rapidity of its subsidence after injection of neosarsphenamine and after treatment with penicillin.

Although it is well known that rat-bite fever, when untreated, is liable to persist for many months, its tendency to relapse after arsenical treatment is much less commonly recognized. Most textbooks state that one to three injections of neoarsphenamine usually suffice. In the present case the inadequacy of three injections, or even of a further seven, requires no emphasis. The decision to use penicillin was based on the report of its success in treatment of experimental infection of mice with *Spirillum minus* (Lourie and Collier, 1943), and with *Spirillum minus* and *Streptobacillus moniliformis* (Heilman and Herrell, 1944; quoted by Herrell, Nichols, and Heilman, 1944). It would appear that the present paper is the first record of the clinical use of penicillin in *Spirillum* infections.

Apart from the case of Beaumont and Gill, already mentioned, which was also due to a cat-bite, very few similar cases have been recorded in the literature; Laverick (1936) and Cole (1936) each described one case, while Yamamoto (1938) recorded two. The last-named was able to isolate spirilla from both patients, and Cole demonstrated the organisms in a guinea-pig after inoculation with a lymph-gland extract from his patient; the other authors failed to isolate the organisms.

Finally, some comment on the name "rat-bite fever" or "cat-bite fever" seems justifiable. Neither of these names is satisfactory, nor is sodoku, which merely means "rat poison" in Japanese, because these two animals are not the only vectors of the disease, which remains the same, however conveyed. The term "spirillosis" is suggested as being less objectionable than others hitherto proposed.

Summary

A case of so-called rat-bite fever following the bite of a kitten is described. Some aberrant features are discussed, especially the occurrence of severe myositis, repeated relapse after arsenotherapy, and apparent final cure by means of penicillin. A plea for the use of the term "spirillosis" in preference to "rat-bite fever" or "cat-bite fever" is made.

My thanks are due to Dr. H. B. Russell for permission to publish this case.

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Medical Memoranda

A Case of Acute Dilatation of the Stomach

I recently met with a case of this rare condition, which occurred spontaneously in a woman aged 62 in apparently good health, actively engaged in domestic work, and which seems to be worthy of notice.

CLINICAL HISTORY

I was visiting the house to see a sick child on March 31, 1944, and saw the woman, who made no complaint regarding her own health. The next day she remarked to her daughter, who was out all day on war work, that she was not feeling well. On April 2 she said that she had vomited during the night. She had some hot milk and tea; later, feeling better, she came down and had some bread-and-butter and tea. She went to bed at 6.30 p.m., complaining of great thirst. She took some milk, half a siphon of soda-water, some more milk, and a little whisky.

Her condition became so alarming that I was sent for at 9.30 p.m., and found her suffering from profound shock. The extremities were cold and cyanosed, and the pulse was imperceptible at the wrist and in the brachial artery. On auscultation the heart sounds were weak—rate 120, regular. Abdominal palpation at once revealed the diagnosis: the stomach extended down to the pelvis, succussion was easily obtained, there was no visible peristalsis, and the tongue was dry. She complained of great thirst. Hastily I went home two and a half miles for funnel and tube, and the district nurse. I gave rectal saline in the left lateral position with catheter and funnel. This the nurse continued while I passed the stomach-tube, in doing which the patient readily co-operated. Without any difficulty, and with very little retching, I siphoned off 4 pints of liquid gastric contents. The patient was much relieved, and asked for a cup of tea, which I refused. The nurse continued to give rectal saline, and as the patient seemed to be definitely improving I returned