Chronic Meningococcaemia

REPORT OF A CASE

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SUMMARY

A case of chronic meningococcaemia is presented. The clinical features, complications, laboratory findings and treatment of this condition are discussed. The resemblance, both clinically and histologically, to allergic vasculitis is stressed.

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Chronic meningococcaemia is an uncommon condition today, but was well recognised in the early decades of this century. The purpose of this report is to draw attention to the disease and to its marked clinical similarity to allergic vasculitis.

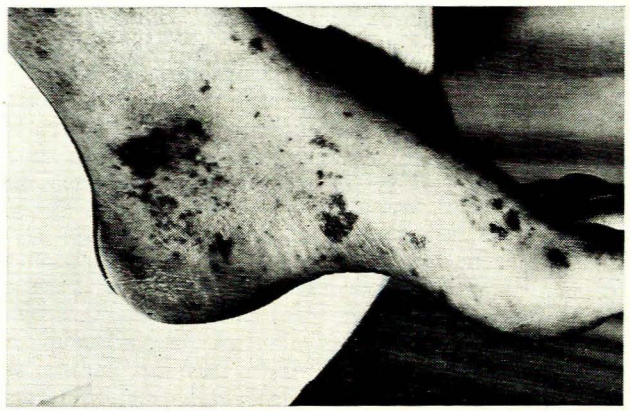

Fig. 1. Erythematous and purpuric lesions on the foot and ankle.

CASE REPORT

A 25-year-old White female had been perfectly well until the morning of admission to hospital, when she became feverish, vomited and developed a rigor. She treated herself with aspirin but remained feverish and on the evening of the same day she noted the appearance of a rash over the lower legs. The eruption was not itchy but was tender. She also had joint pain and had experienced a sore throat a few days prior to admission.

On examination, the oral temperature was 39°C and the pulse rate 120/minute. The blood pressure was 100/70 mmHg, and the clinical examination was normal, except for some arthralgia on passive movement and a skin eruption.

The rash consisted of erythematous macules and papules on the thighs, which failed to blanch on pressure. The lesions on the lower legs, feet and hands had central purpuric areas and some of the older lesions had a gunmetal-grey centre (Fig. 1). The rash was mainly distributed over the peripheral parts of the limbs, but some lesions were noted on the more proximal parts and there were only a few lesions on the trunk and buttocks. The mucosal surfaces were normal.

The electrocardiogram showed T-wave inversion in leads S-2, S-3 and AVF and flattening over the anterolateral chest leads. Urine examination showed 2-plus protein on Labstix. On microscopy there were more than 20 white blood cells and about 20 red blood cells per high-power field. There were also numerous granular and cellular casts.

On admission the haemoglobin was 16,1 g/100 ml, the white cell count was 26 800/mm^3, with a shift to the left, and the platelet count was 97 000/mm^3. The Westergren erythrocyte sedimentation rate was 105 mm/1 hour. The blood urea was 56 mg/100 ml, serum creatinine 1,8 mg/100 ml with normal serum electrolyte levels. A repeat platelet count was 72 000/mm^3, and coagulation studies were normal.

A clinical diagnosis of allergic vasculitis was made and a skin biopsy was performed the day after admission. This showed a normal epidermis and a mixed cellular infiltrate surrounding dermal blood vessels, the walls of which were slightly thickened and showed some areas of fibrinoid necrosis. There were some areas of leucocytoclasis. No bacteria were observed with appropriate staining (Fig. 2).

Blood cultures were taken and treatment started with corticosteroids, heparin and dipyridamole, since a widespread vasculitis was suspected. On this treatment the platelet count rose to 175 000/mm^3, the blood urea and serum creatinine fell to 28 and 1,0 mg/100 ml respectively, and the rash appeared to be fading. However, the pyrexia and leucocytosis persisted and the arthralgia worsened. On the third day after admission, we were notified that *Neisseria meningitidis* group C had been isolated on blood culture. Re-examination of the patient revealed no signs of meningitis, and on lumbar puncture the CSF was sterile and the cell count, protein and sugar were within normal limits.

Penicillin in a dose of 2 million units every 4 hours was given intravenously, and the corticosteroids, heparin and dipyridamole were discontinued. The patient's general condition improved and the rash faded. She remained mildly

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Fig. 2. Histological section of a skin biopsy showing a cellular infiltrate surrounding dermal blood vessels.

pyrexial and after 4 days on penicillin alone, sulphadiazine (to which the organism was sensitive) was added, and the penicillin increased to 2 million units every 2 hours, given intravenously. The temperature settled rapidly and the penicillin was stopped after 2 weeks. Oral sulphadiazine was continued for another 2 weeks and when the patient was seen as an outpatient one month after discharge, she was completely well.

DISCUSSION

Many of the reports in the literature concerning chronic meningococcaemia date from the pre-sulphonamide era, and the natural course of the disease is typified by Salomon's patient, reported in 1902, and cited by Carbonell and Campbell.[1] She was a 32-year-old woman who had experienced intermittent chills, fever, rash, myalgia and arthralgia for 2 months. Meningococci were cultured from the blood, but it was not until 2 months after the onset that meningitis supervened. She eventually recovered after an illness of 4 months' duration.

Dock[2] in 1924 described a case of intermittent fever of 7 months' duration, due to meningococcaemia. He defined chronic meningococcaemia as meningococcal septicaemia in which there is a febrile period of at least a week, without meningeal symptoms, and in which the clinical course changes abruptly if meningitis supervenes. The natural course was not seen in our patient because of early detection and appropriate treatment, and because the condition was subacute rather than chronic.

In an extensive review of the literature up to 1963, Benoit[3] described the incidence, clinical features and laboratory investigations of 148 cases. His figures of age and sex incidence were biased by the large number of servicemen in the series, but it would appear that the disease occurs in otherwise healthy young people of either sex.

Table I shows the clinical features and their frequency in Benoit's series. The fever, which was present in all cases, was most often intermittent, and the rash tended to occur with the rise in temperature and fade as it subsided. The rash was most often described as maculopapular, although petechial and nodular changes were also noted. Less frequently, ecchymotic or pustular lesions were reported, and a combined polymorphous eruption was common.

TABLE I. CLINICAL FEATURES OF CHRONIC MENINGOCOCCAEMIA IN A SERIES OF 148 CASES[3]

Clinical features	No. of cases
Fever	**148**
Rash	**138**
Arthralgia	**68**
Arthritis	**32**
Myositis	**2**
Headache	**91**
Previous upper respiratory tract infection	**55**
Splenomegaly	**20**
Weight loss	**13**

In 1964 Ognibene and Dito[4] reported a case and stated that rose-coloured lesions with a central petechial element were the most characteristic eruptions. Nielsen[5] in 1970 reported a case with characteristic skin lesions which histologically showed perivascular inflammation, endothelial swelling and fibrinoid deposition in the vessel walls. There were polymorphonuclear leucocytes in the walls, with extravasation of red blood cells. From both a clinical and a histological point of view the skin lesions resemble those of allergic vasculitis.

In Benoit's series joint changes were common and took the form of a migratory polyarthralgia, but in one-third of cases with joint involvement, signs of arthritis were present. The other features noted were headache, previous upper respiratory tract infection, weight loss and splenomegaly.

Complications due to localisation of infection occurred in 59 cases. Meningitis was the most common complication and occurred in 23 cases. It is of interest to note that

once meningeal localisation occurs, the nature of the disease changes to that of an acute meningitis. The next most common complication was carditis which occurred in 19 patients (with 10 deaths). The nature of the cardiac illness was most often subacute and acute meningococcal endocarditis, although myocarditis was present in one patient and there were a few with pericarditis. The other complications can be seen in Table II. The total mortality in the series was 15.

TABLE II. COMPLICATIONS IN A SERIES OF 148 CASES OF CHRONIC MENINGOCOCCAEMIA[3]

Complications	No. of cases
Meningitis	**23**
Carditis	**19**
Anaemia	**16**
Nephritis	**10**
Epididymitis	**3**
Thrombocytopenia	**1**
Conjunctivitis	**1**
Iritis	**1**
Retinitis	**1**
Deaths	**15**

The laboratory findings are simple: a leucocytosis, elevated erythrocyte sedimentation rate and positive blood cultures for *N. meningitidis* are found in most cases, although repeated cultures might have to be taken. Swabs taken from the throat are occasionally helpful, but the skin lesions are sterile, in contrast with acute meningococcaemia. The skin histology resembles an allergic vasculitis and is of no diagnostic significance.

In terms of therapy, the meningococcus remains universally sensitive to penicillin G, which should be used in doses for septicaemia (20 - 30 million units/day). Sulphonamide resistance commonly occurs and sensitivity must be tested for specifically.

The marked similarity, both clinically and histologically, to allergic vasculitis, is well shown in our patient. Chronic meningococcaemia should be excluded in any patient presenting with such skin lesions in association with a pyrexial illness. With early diagnosis and treatment, the course is subacute rather than chronic.

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