delays are not. In fact, for the 92 letters studied the average delay between consultation and dictation was 4.7 days; 40 general practitioners felt that a delay up to 14 days was acceptable.

Conclusions

The standard of communication in letters needs improvement on both sides, but the general practitioners' referral letters came nearer to meeting the needs of the psychiatrists than the psychiatrists' letters did to meeting the general practitioners' requirements. What recommendations can be made? A special "psychiatric referral form" is unlikely to be an advantage, as in practice there is already a profusion of forms to be coped with, and to add yet another would not be appreciated.

General practitioners should take note of psychiatrists' requirements and try, so far as possible, to fulfil them in their referral letters. Bearing in mind the remarks made above about suicide risk it would also be helpful if a general practitioner could state specifically with what aspects of the patient's problem he required help.

As regards the psychiatrists' letters the dual function of case summary and specialist opinion is not satisfactorily fulfilled in

one letter. A detailed summary for retention in the notes, with an additional but shorter letter to the practitioner, seems to be the ideal answer. Since this is unlikely to take place (because of lack of time, clerical staff, etc.) it is the duty of psychiatrists, and indeed of all hospital doctors, to make themselves aware of general practitioners' requirements in respect of letters and to attempt to fulfil them, particularly in respect of their educative function.

Our thanks are due to Dr. A. C. Brown for helpful advice and comment. We should like to thank all the general practitioners and psychiatrists who filled in our questionnaire, and especially the members of the Royal College of General Practitioners South East Wales Special Interest Group (Psychiatry).

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Clinical Topics

Outbreak of Meningococcal Disease in Devon

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British Medical Journal, 1974, 1, 507-509

Summary

In a recent outbreak of 31 cases of meningococcal disease in Devon there were six deaths. Several patients had an unusual rash as the presenting feature and there was an unusually high incidence of complications, affecting the central nervous system, joints, and the heart among other sites.

Introduction

During the past 25 years the incidence of meningococcal meningitis in England and Wales has been decreasing steadily. Recent figures suggest that there has been a recrudescence of meningococcal infection.¹ There were minor outbreaks in Bol-

ton during 1970 and 1971 and in Monmouth in December 1972. We report an outbreak of meningococcal infection in Devon between October 1972 and May 1973 which reached its peak in the early months of 1973. The main purpose of this paper is to highlight the high complication rate which may reflect a changing pattern of meningococcal disease in Britain.

Patients and Methods

There were 31 patients, 18 of whom had proved meningitis. In 24 the diagnosis was confirmed by isolation of meningococci from the blood, cerebrospinal fluid, or joints. In seven patients the diagnosis was made from the characteristic haemorrhagic rash and the clinical course of the illness. The symptoms had lasted from a few hours to several days, the history was 24 hours or less in all the fatal cases. Two of the deaths occurred suddenly at home and the remainder shortly after admission to hospital. The disease was most common in the first year of life and 21 of our patients were under 10 years (table I). There were 17 male and 14 female patients.

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TABLE 1—Age Range, Incidence, and Mortality in 31 Patients

Age in Years	0-	1-	5-	10-	20-	30-	50 and Over
No. of Cases	7	9	5	5	3	0	2
No. of Deaths	2	0	0	3	0	0	1

The commonest single aid to diagnosis was the rash, which was obvious in 21 patients and detected in six others only by careful examination. The characteristic rash consisted of scattered petechiae later becoming confluent and haemorrhagic. Some of the lesions developed necrotic centres. The rash was usually most noticeable on the limbs but also involved the trunk and head. Occasionally petechiae were seen on the buccal and conjunctival mucous membranes. Several patients had a transient prodromal rash. This consisted either of a generalized erythema or, more commonly, a faint, diffuse, macular eruption. In all cases this was followed by the appearance of petechiae.

Complications

A total of 17 of our patients developed one complication or more (see table II). Central nervous system complications were the most common and occurred only in patients who had meningitis. Of eight patients who had convulsions seven made a complete recovery and in one convulsions were a terminal event. Two patients developed signs of coning with Cheyne-Stokes respiration after lumbar puncture. Both were treated with dexamethasone to reduce cerebral oedema with significant improvement and eventual recovery. The only persisting central nervous system complication was unilateral neuronal deafness in three patients.

Pericarditis and arthritis have become uncommon complications in this country.² Four of our patients had arthritis when they were admitted and this gave rise to diagnostic difficulties.

TABLE II—Complications in 17 Patients

	No. of Patients
Central nervous system:	
Convulsions	8
Neuronal deafness	3
Seventh nerve palsy	2
Sixth nerve palsy	1
Unilateral ptosis	1
Cheyne-Stokes respiration	2
Arthropathy	5
Chest infection	2
Pericarditis	1
Haematuria	3

Case Reports

A 6-year-old boy was referred by his family doctor as a suspected case of rheumatic fever. He had had a cough for 14 days and earache for four days and had been febrile for one day with discomfort in several joints. His temperature was 39°C and he had an erythematous rash, most noticeable on his shins and forearms, which did not fade on pressure. His knees, ankles, elbows, and wrists and the small joints of his hands and feet were warm, with restricted, painful movements. After 12 hours the erythematous rash had faded and he had a faint maculopapular eruption mainly on the dorsum of the feet, the wrists, and the upper chest. There were three tiny haemorrhagic lesions highly suggestive of meningococcal septicaemia.

Investigations.—Cerebrospinal fluid was normal and blood cultures were sterile. Aspiration produced 5 ml of purulent fluid from the left knee. Gram-negative diplococci were seen on the stained film and *Neisseria meningitidis* was cultured.

Treatment was started with penicillin, chloramphenicol, and sulphonamides (triple therapy). He remained ill for a further 14 days and antibiotics were discontinued when his joint effusions had completely resolved at 21 days.

Another patient is of interest because he developed arthritis and pericarditis on the third day of treatment.

A 13-year-old boy was admitted with a two-day history of fever, headache, earache, and vomiting. He was delirious and there were scattered purpuric lesions on the arms, legs, and trunk. There was a soft systolic murmur in the pulmonary area. He had noticeable

neck stiffness, Kernig's sign was positive, and also he had a left lateral rectus palsy.

Investigations.—Cerebrospinal fluid was purulent and contained 200 white blood cells/mm³, all of which were polymorphs. Gram-negative diplococci were seen on the stained film and meningococci were cultured. Blood cultures were negative.

He was treated with parenteral triple therapy. The next day he had improved and chloramphenicol was discontinued. Nevertheless, three days after admission his fever increased and his neck stiffness became more noticeable. A loud pericardial friction rub was heard and he had polyarthritis. Purulent fluid was aspirated from both knees and the left elbow but no organisms were seen on the film and there was no growth on culture. E.C.G. at this time showed T-wave changes compatible with acute pericarditis and his chest x-ray film showed an enlarged cardiac shadow. Chloramphenicol was reintroduced, his fever decreased, and his joint effusions slowly resolved over the next 10 days.

Arthropathy most commonly affected the knees, elbows, and wrists. Two patients had extensive involvement of the small joints of the hands. In all five patients with arthropathy the aetiology was considered to be infective. Nevertheless, in one case repeated aspirations showed no organisms and an allergic basis, as described by Whittle *et al.*,³ must be considered. Generalized muscle tenderness was a striking presenting feature seen in three patients. Frank haematuria occurred in three patients, all of whom were receiving treatment with sulphadiazine. Sulphonamide crystals were seen in the urine of only one patient, but the haematuria resolved in all three patients when the sulphonamides were withdrawn.

Four patients developed meningococcal infection while under routine outpatient observation and treatment for other clinical conditions. These were diabetes mellitus, systemic lupus erythematosus, pregnancy, and urinary diversion into the colon as a result of ectopia vesica. All these patients eventually recovered. The patient who was 32 weeks pregnant at the time of admission later had a normal child.

Fatalities

Three of the six patients who died had been seen by their general practitioner early in the course of the illness.

A 6-month-old infant was seen because she had vomited and became apathetic. She had pharyngitis and tachycardia but there were no other abnormal findings. Six hours later she collapsed, and died soon after admission to hospital.

A 10-month-old infant had refused his feeds. He was lethargic with a low-grade fever. Several hours later he developed an extensive petechial rash and died within an hour.

A 16-year-old boy had mild diarrhoea and vomiting. He was seen by his doctor after a rigor, and a diagnosis of influenza was made. The next morning he was delirious with a generalized petechial rash, and died soon after admission to hospital.

Two patients were resting in bed at home with non-specific symptoms. After 24 hours they rapidly deteriorated and were admitted to hospital, where they died.

The sixth fatality, a youth of 17, came home late from a dance and was found dead in bed the next morning.

From a study of these cases it is difficult to see how the diagnosis could have been made earlier. Two of the patients did not have a rash, and in two of the remainder the rash was not conspicuous and appeared late.

Treatment

Most of our patients were treated at first with penicillin, sulphonamides, and chloramphenicol (triple therapy), but some received only penicillin and sulphonamides. Though this is a small series, there did not appear to be any difference in the incidence of complications between these two groups. Only two of the meningococcal species isolated were resistant to sulphonamides. None were resistant to penicillin.

Meningococci were isolated from the cerebrospinal fluid of three patients with low cerebrospinal fluid cell counts (3, 12, and 5 white blood cells/mm.³). If this indicates only minimal inflammatory response in the meninges penetration of penicillin into the cerebrospinal fluid may be poor, so that the inclusion of chloramphenicol which passes well into the cerebrospinal fluid might be a beneficial addition to the treatment regimen. Furthermore, though the combination of a bactericidal and bacteriostatic agent is not generally recommended, in-vitro studies have shown that there is no appreciable antagonism between penicillin and chloramphenicol if adequate levels of both antibiotics are achieved.⁴

Prevention

Immunization against meningococcal infection appears to be the only way of preventing the fulminating illness which killed six of our patients before effective antibiotic therapy could be started. Group B meningococci predominated both in the Monmouth outbreak and in our series. There is, however, no satisfactory group B vaccine yet available, though recent trials with group A and group C vaccines have been encouraging.⁵

On two occasions more than one member of the family developed meningococcal disease. We believe that family contacts should be screened and should all be given an adequate course of prophylactic treatment. We gave all our contacts full therapeutic doses of soluble sulphonamides by mouth for one

week. Penicillin, ampicillin, tetracyclines, and erythromycin have been shown to be ineffective in the treatment of the nasopharyngeal meningococcal carrier state. Rifampicin appears to be the treatment of choice to be reserved for carriers of sulphonamide-resistant meningococci.⁶ Though sulphonamide-resistant organisms were found in only two of our patients the high community meningococcal-carrier rate⁷ and the probable recent increase in meningococcal disease may indicate a reducing sensitivity of meningococci to commonly-used antibiotics.

We are grateful to Dr. D. W. Boyd, Dr. R. S. Crow, Dr. A. J. Daly, Dr. M. George, Dr. G. H. Hall, Dr. J. N. Montgomery, and Dr. B. Moore for their advice and for permission to report details of patients under their care.

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Conversations with Consultants

Coketown Hospital versus the Administrators

FROM A SPECIAL CORRESPONDENT

British Medical Journal, 1974, 1, 509-511

Coketown is one of those many manufacturing towns on which Britain's prosperity has always depended. A Southerner might recoil from its legacies of the Industrial Revolution—derelict warehouses on the steep, sometimes cobbled, roads, and grimy back-to-back houses—mixed with modern housing estates and brand new factories eating into the green hills on the outskirts. In the centre of the town stands a handsome new district hospital, and it was here I started a short tour of Britain talking to consultants about their daily lives and problems. Though representative only of Coketown experience, these were far from what I had expected: they were happy that they could still do the sort of medicine they had been trained for, and their grouches were not about pay, Salmon, and N.H.S. reorganization, but centred principally and vituperatively on poor administration and inadequate administrators—and the way in which these interfered with the consultants' ability to practise efficient medicine.

"They" Know Best

These problems had been typified by the new hospital itself, they started by saying. Certainly it functioned well and had

been adequately equipped—and it was often still easier to get largish grants for new capital expenditure than smaller ones for running costs. But the regional hospital board, at Stanthorpe, many miles away, knew best, insisting on siting the hospital in the town centre, against local expert advice, which had urged the merits of building it on the outskirts. In the centre there was no room at all for expansion, yet Coketown itself was increasing in size all the time. This meant that several smaller hospitals in the town had had to be kept open to deal with the load and consultants wasted valuable time in commuting among them. Sometimes the situation led to wasteful duplication of facilities, beds, and staff. The intensive care unit was situated in the district general hospital, as was the main radiology department, but perforce cardiac operations were done in the chest hospital on the outskirts and trained technicians and expensive equipment were needed in both. Perhaps an important factor in the background to this story, which was similar to several others the consultants could tell, was that Coketown had once been fairly high up on the list as the site of a new medical school—the regression of this idea had possibly been responsible for paralysing plans for further hospital expansion.

Did they regret that they had not been chosen as an undergraduate centre? They had at first, but they now thought with the present Government cuts that they might have escaped even more stress. The hospital had a flourishing