AN OUTBREAK OF ECHOVIRUS TYPE 19 ILLNESS IN WOLFENBUTTEL JUNE TO AUGUST 1974

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SUMMARY: An outbreak of Echovirus Type 19 illness occurring in a British Military Community in West Germany is described, and the management of both the individual case and the outbreak is presented.

Introduction

An epidemic of Echovirus type 19 illness occurred in the British Military community in Wolfenbuttel between mid-June and the end of August 1974. Wolfenbuttel is a market town in Lower Saxony eight miles south of Braunschweig with a population of approximately 50,000.

The Station Medical Centre, situated in Northampton Barracks on the North-East outskirts of the town, serves a military population including dependants of approximately 1,800, spread over a wide area from Wolfenbuttel and Braunschweig in the West to Helmstedt and Schoningen in the East. The main concentration of Army quarters is in Wolfenbuttel and Braunschweig. The Medical Centre is staffed by one General Duties Medical Officer, 5 Regimental Medical Assistants, 2 civilian Sisters (dependants) and one S.S.A.F.A. Sister.

The first cases of this influenza-like illness were seen at the Medical Centre in the week of 17 to 22 June 1974 although the characteristics of the illness and its epidemic proportions were not apparent until 29 June. Figure 1 shows the daily new case totals presenting at the Medical Centre. At first a very high proportion of new cases were children and the infection spread rapidly through the Kindergarten and the British Forces Education Service Primary School. The children thus took the illness home and spread it through the rest of the family and whole blocks of married quarters became rapidly involved. The illness appeared to have an incubation period of between 48 to 72 hours.

Between 29 June and 23 July 252 cases had been seen and recorded at the Medical Centre and on domiciliary visits. Additional cases continued to present after this date until the last week of August. In addition approximately 30 to 40 other cases had been seen prior to the 29 June but separate records had not been kept. Even this total is an underestimation and the real incidence of the illness was probably nearer 400. This was because when one member of a family was diagnosed, others who subsequently contracted the illness, were not brought to the Medical Centre. For instance, out of 432 questionnaires distributed to the families in Wolfenbuttel Station, only 121 were returned but these showed that, amongst 202 patients who admitted having symptoms of the illness, 89 (44.05 per cent) had not been seen by the Medical Services. This percentage addition could then be applied to our known total to give the approximate figure of 400.

It was also possible to establish a picture of the age distribution of the illness from the results of the questionnaire, in 202 cases (Fig. 1). This figure does not indicate a

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Fig. 1. Age distribution of 202 patients.

natural immunity in the teenage population but reminds us of the absence of this age group in most military communities. They are away at boarding schools and the peak of this epidemic had passed before the school holidays started (Fig. 2).

Clinical features

The illness presented in two distinct forms depending on the age of the patient. The younger children presented with a high fever progressing to vomiting, whereas the older children and adults presented with headache as the predominant symptom. Figure 3 shows the presenting symptoms in 240 documented cases.

Headache was the most distressing symptom of the illness. It was often the first to present and the last to go and it was characteristically in the frontal region with pain behind the eyes. In a few patients the headache became severe and when associated with photophobia and neck stiffness the illness mimicked meningitis. One case of viral meningitis was diagnosed during the period of the outbreak, but the causal agent was not isolated.

Abdominal pain, nausea, vomiting, dizziness, sore throat, pyrexia and cough were all common symptoms. Some degree of myalgia or arthralgia occurred in most patients.

Many patients had severe pain around the base of the ribs and the intercostal muscles, suggesting a clinical diagnosis of Bornholm's pleurodynia. Diarrhoea was not a feature of this illness and was seldom seen.

Fig. 2. Daily new case totals.

Fig. 3. Presenting symptoms in 240 patients.

The symptoms lasted on average 4 to 5 days although extremes of 48 hours and 8 days were noted. It became clear that some children only had the symptoms for a very short period of 36 to 48 hours. As soon as they felt well, despite contrary instructions, they went out to play or back to school, thus spreading the infection. Closing the BFES School undoubtedly helped to reduce this method of spread.

Investigations

As soon as the epidemic nature of the illness was realised, steps were taken to identify the causal virus. 29 patients in the acute phase of the illness submitted themselves for investigation.

From these patients, 29 sets of acute and convalescent paired sera, 24 throat swabs, 2 nose swabs and 3 faecal specimens were sent to the Virology Department of the Royal Army Medical College. Echovirus 19 was isolated from three patients in both their throat swabs and faeces (Table 1). They also had diagnostic rising titres on serum

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Table I
Summary of virological investigations

Group	Patient		Throat swab	Faeces	Paired sera	
					First specimen	Second specimen
I	1	26M	VI	VI	<80	160
	2	33M	VI	VI	<80	320
	3	29F	VI	VI	<80	160
II	4	27M	NVI	—	80	> 320
	5	29M	NVI	—	80	> 320
	6	?M	NVI	—	<80	> 320
	7	29M	NVI	—	<80	160
	8	24M	—	—	80	> 320
	9	7M	—	—	<80	160
	10	?F	—	—	<80	320
	11	24M	—	—	<80	> 320
III	12	30M	NVI	—	> 320	> 320
	13	28M	NVI	—	80	160
	14	26M	NVI	—	80	160
	15	27M	NVI	—	160	160

Notes: Echovirus type 19 isolated = VI. No virus isolated = NVI. No specimen sent = —.

neutralising testing. A further 8 patients were found to have a diagnostic rising titre (Group II on Table 1) and 4 more a suggestive rising titre (Group III on Table 1) although the virus was not isolated in either group from their throat swabs where these were done. Therefore out of 29 patients investigated, 15 (51.7 per cent) showed evidence of Echovirus 19 infection (Vella 1974).

Total white cell counts were carried out on 11 patients and ranged from 3.4 to $14.1 \times 10^3/\text{mm}^3$ with a slight lymphocytic predominance but otherwise they were unremarkable.

Complications

The alarming nature of some of the symptoms of this illness suggested meningitis but only one case occurred during this outbreak and no virus was isolated from the patient. All patients recovered completely in 7 to 10 days but residual lethargy lasted as long as 14 days. Two complications of treatment were seen. One was a whole body urticarial reaction to soluble aspirin and the other a mild haematemesis also attributed to aspirin. In both cases the symptoms subsided and no further trouble occurred after treatment with aspirin was discontinued.

Management of the individual case

Treatment was aimed at symptomatic relief. In adults the mainstay of treatment was bed rest, isolation, soluble aspirin or paracetamol, and metaclopramide (*Maxalon*). Pentazocine (*Fortral*) either orally or intramuscularly was given for severe headaches. Antibiotics were withheld in all but a few known 'bronchitics' who were given a course of Oxytetracycline. Children responded well on Paracetamol elixir or soluble aspirin, and Magnesium trisilicate or the syrup of Metaclopramide.

Management of the outbreak

In an attempt to contain this epidemic, the Kindergarten was closed on 3 July (Fig. 1) and the BFES School on the 5 July. It has been considered that influenza-type outbreaks are not controlled by closing schools (Benenson 1970). However, in a military community such as Wolfenbuttel, where all the children travel to school by Army buses from 3 or 4 groups of quarters, closing the school represents a way of breaking the cycle. Theoretically this should prevent the spread from one group of quarters to another. Needless to say, this could not be achieved because the illness was already introduced to most areas before the school was closed. Although the action of closing the school was not expected to eradicate the illness, the numbers of new cases presenting amongst the children showed an appreciable drop.

Preparations were made along established lines for the management of the epidemic amongst the single soldiers. Barrack rooms were prepared and extra staff from the parent unit who held Regimental Medical Assistant qualifications but were not employed in the Medical Centre were used to provide 24 hour cover for this emergency ward accommodation. However, throughout the epidemic, there were only 11 single soldiers who required to be placed in this isolation. A reason for this might be that there is little contact between the married and single soldiers except during working hours, so the policy of immediate isolation at home of the married men may have prevented spread to the single men.

However, some more senior soldiers who became ill, continued working because they considered themselves indispensable and would not readily allow themselves to be confined to bed "just for flu". This undoubtedly contributed to the further spread of the virus and much time was devoted to explaining to patients the importance of isolation as far as it was practicable.

It will be noted on Figure 1 that there is a sudden rise in the numbers of new cases between 20 to 24 July. All these cases were returned from a regimental exercise having become ill after the first day in the field and the close living conditions of armoured fighting vehicle crews helped to spread it.

Discussion

There are 34 serotypes of Echovirus which combined with the Polio and Coxsackie viruses form the enterovirus subgroup of the Picornaviruses (Lerner 1974).

The Echoviruses are associated with a number of clinical syndromes namely aseptic meningitis, paralytic disease similar to poliomyelitis, respiratory-enteric diseases, gastro-enteritis and conjunctivitis. Echovirus 19 is particularly associated with respiratory-enteric disease combining sore throat and nasal congestion with diarrhoea.

The prototype 19 Echovirus was first isolated in 1955 from children with summer diarrhoea (Ramos-Alvarez and Sabin 1958). The virus was first isolated in adults in a case of aseptic meningitis in 1959 (Faulkner and Ozere 1960). Since then the Echovirus type 19 has attracted little attention until 1974, illustrated by the following figures for isolation of the virus in the United Kingdom by the Public Health Laboratory Service (1974). There were 566 isolations reported in 1974 whereas between 1969-1973 the average annual total isolations were only 23.

This outbreak in Wolfenbuttel had four unusual and interesting features. Firstly very small numbers of single soldiers presented with the illness. Secondly, the virus had

a very high infectivity with an incubation period of 48 to 72 hours. This was well seen in the speed with which whole blocks of multiple hirings were infected. The third unusual feature was the high rate of recurrence of symptoms. Patients were seen with two or even three attacks separated by at least 10 to 14 days of apparently good health. Fourthly, this infection was not present in the local population at the time the epidemic was rampant amongst the British personnel. German practitioners consulted during August and September had recognised no similar cases in their own practices.

It is impossible to be sure of the epidemiology of this outbreak but the following facts are known. Echovirus type 19 was first isolated in B.A.O.R. in 4 cases from Nienburg 150 Km north-west of Wolfenbuttel in May 1974 (Vella 1974). The first cases were seen in Wolfenbuttel in mid-June but the first viral isolation was not made until early July. This month also saw cases in Hildesheim, 58 Km south-west of Wolfenbuttel and Echovirus 19 was isolated in 2 of them. It has since become clear that the infection has spread throughout much of B.A.O.R. and virus isolations have subsequently been reported from Rinteln, Munster, Iserlohn and Berlin (Vella 1974).

This epidemic provides two lessons for the future. Firstly it reaffirms the well established principles of having contingency plans made to cope with epidemics of this type particularly amongst single soldiers. Had this epidemic affected the living-in soldiers to the extent it did the families, then a large number of beds would have been required for periods of up to a week per patient. At the present time, all the soldiers' accommodation in these barracks is in rooms of 6 beds or less. Although this situation is desirable in the nursing of infectious diseases, it poses problems over nursing and feeding. The original estimate of beds required was 60 and had this number been realised, the only place to nurse them effectively would have been the gymnasium.

The second lesson is that where enteroviruses are considered as responsible for an outbreak, stool specimens are valuable for virus isolation even when diarrhoea is not a feature of the illness. In this outbreak only 3 such specimens were provided and yet the virus was isolated in each one (Table I).

Finally it is worth mentioning that as Echovirus 19 disease is now coming into prominence, the question of its effect on the foetus should be considered. No teratogenicity has been demonstrated in this outbreak but some of the first trimester pregnancies that contracted the illness have not yet been delivered.

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British Limbless Ex-Service Men's Association

THE three armed services have again substantially contributed to the funds of the British Limbless Ex-Service Men's Association (BLESMA) over the past year and now the Army Benevolent Fund has donated £1,000 to name another bed at BLESMA's Blackpool Residential Home, on behalf of all the Regiments and Corps of the British Army.

Last year one young Signalman, Alan Armstrong, cycled nearly 1,000 miles from West Germany to BLESMA's Headquarters in London and back, raising from his sponsors more than £800 for the Association's funds. He said that he was inspired to do this as a result of reading about the needs of BLESMA in his Regimental Magazine., "The Wire". Consequently, as you will appreciate, BLESMA continues to place great importance on the value of Service publications.

Dr. Elizabeth Frankland Moore, BLESMA's Honorary Secretary of Appeal who has personally raised over £1½m since 1948 for BLESMA, said in London "We are most grateful for this wonderful support of our work, and what is so encouraging is that the Servicemen of today show such concern for their limbless comrades of the two World Wars and of the many conflicts in which British servicemen have since been involved".

All kinds of ingenious projects have been devised by the Services to raise funds for BLESMA and Dr. Frankland Moore has forged many bonds of friendship for the Association in correspondence with the donors. Funds have been raised as a result of jumble sales, organisation of thrift shops, sponsored walks and climbs, and collections in Garrison clubs and churches (on Remembrance Sunday) both at home and abroad, and in officers' wives clubs.

The Army, Royal Navy and Royal Air Force have all been increasingly concerned over recent years for the plight of the limbless ex-servicemen who, in turn, have been greatly helped by the generosity of today's service men and women.

BLESMA particularly thanks the officers, warrant officers, and men and women of all the fighting services for their ever-increasing sympathy and support, which it is hoped will continue to help meet rising costs.

BLESMA's services will undoubtedly be required for many years to come. They include grants for the relief of financial hardship; continuing grants to widows; Residential Homes for permanent residence, convalescence, or change of air, as well as a break for relatives from nursing care; rehabilitation training; placing in employment; pensions case-work, and research on artificial limbs and appliances.

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