A SYMPOSIUM ON INFLUENZA FROM WESTERN COMMAND

The following is an account of a symposium on influenza held at the Military Hospital, Chester, on Friday, 4th October, 1957. It is not a verbatim report, but rather a summary of the main points brought out by the various speakers.

The object of the symposium was to present to medical officers the epidemiological, clinical and laboratory aspects of influenza as observed in Western Command during the outbreaks of the preceding eight weeks, and to remind them of the more common forms which the disease may assume in its various manifestations and complications, as well as of the pitfalls to be avoided.

The Chair was taken by Colonel E. J. Curran, C.B.E., officer commanding the hospital, who introduced the speakers.

EPIDEMIOLOGY

Colonel T. A. Pace, Deputy Director of Army Health, Western Command, opened the discussion with a brief survey of the current outbreak of Asian influenza. He traced the world-wide spread of the disease from its first appearance in April, 1957, in Hong Kong, which it might have reached from the interior of China. By the end of that month it had appeared in Singapore, and by the end of May widespread outbreaks had occurred in Malaya, Indo-China, Indonesia, Borneo, the Philippines, Formosa and Japan. India and Pakistan were affected early in June, followed shortly after by Mauritius and Australia. In Europe the first case, a traveller from the Far East, was reported from Holland in June; by the end of the month the disease had appeared in Roumania, subsequently spreading to Turkey, Germany, Greece, Italy and Malta. In August epidemics were first reported from Africa (Libya), and later from Nigeria, Egypt and the Sudan. In the United States the virus was first isolated towards the end of July, from students who had arrived from Holland, and in the following month outbreaks were notified from South America. In the United Kingdom the new virus was first detected in a Pakistani, a sailor who had arrived from West Pakistan by air on 13th June.

In Western Command the first outbreak occurred at Long Marston, Worcestershire, in mid-August, and by the end of that month outbreaks had been reported from garrisons in or near Ashton-under-Lyne, Brecon, Chester, Donnington, Preston, Rhyl and Wrexham. By the beginning of October practically every garrison in the Command had been affected.

The main features of the present outbreaks, apart from the unusual time of their appearance, were the mildness of the disease and the low case fatality rate, which included a relatively high number among schoolchildren and middle-aged adults. The attack rates had varied from 10 to 40 per cent of the populations affected. In Western Command the overall morbidity rate to date was approximately 12 per cent with only one death. (Note: Corrected notifications up till 6th October give an attack rate of 13.7 per cent. Between 12th August and 3rd
November, when the epidemic was considered at an end, the attack rate was 17.3 per cent, and there were three deaths.)

Stuart-Harris (1947), classified years into three main types from the point of view of influenza mortality, namely those in which the following occurred:

(a) Sharp peaks of mortality with more than 1,000 deaths per week.
(b) Irregular plateaux of mortality above 100, with a maximum of 200-400 per week.
(c) Weekly deaths, never above 100 at any time.

In England and Wales there were 47 deaths from influenza during the week ending 14th September (the last week for which figures were available) compared with 8 for the preceding week. (Note: Deaths from influenza during subsequent weeks until the week ending 2nd November were 121, 282, 442, 591, 600, 396, and 263 respectively.)

It was a very interesting fact that both in Holland and the United Kingdom antibodies to the Asian strain had been found in people aged over 70. Could this be a possible link with the widespread influenza epidemic of 1889-90, which was also of a mild character and which had started in Central Asia at Bokhara?

As regards the coming months, the most serious possibility which had to be considered was whether the virulence of the Asian strain would increase from its present mild level, since the lethal waves of influenza in 1891 and 1918 were preceded in each case by milder epidemics.

THE DISEASE AS SEEN IN THE UNIT

A. Wrexham.

Captain K. W. Hickson, R.A.M.C., described an outbreak involving an Infantry Depot and a Royal Pioneer Corps Depot and Training Centre at Wrexham. The former unit was in barracks, while the latter occupied huted accommodation mainly in Wrexham, but with a detachment at Gresford, six miles away.

The outbreak started during the week ending 31st August, all three camps being involved, though not quite in the same manner. At the R.P.C. camp in Wrexham the peak was reached in the second week, with another sharp rise during the fifth week: the total attack rate was about 40 per cent. The R.P.C. camp at Gresford had an attack rate of 20 per cent, with a peak incidence during the third week; while at the Infantry Depot in Wrexham, where the attack rate was 30 per cent, the outbreak did not reach its peak until the fourth week. It was interesting to observe that the lowest attack rate occurred in a camp where newly joined recruits were fewest, the majority of troops being soldiers undergoing their third or fourth month of training.

The disease appeared simultaneously in different parts of the same camp rather than spreading from billet to billet. The morbidity rates were generally constant in all billets affected. Sleeping quarters were not overcrowded, though there was probably more overcrowding in the N.A.A.F.I. and Television rooms. Each camp had only one main dining hall where cross infection between different groups was possible.
The presenting signs and symptoms were varied. Pyrexia, headache, sore throat, cough and backache were common. Many had shivering and sweating, coryza, chest and limb pains. Vomiting, abdominal pains and stiff neck were noted occasionally. The majority of cases looked ill and dejected. The eyes were red and the skin flushed.

In most cases the temperature was between 99° and 102° F. In 10 per cent of cases it exceeded 103° F., while another 10 per cent were apyrexial throughout, though presenting all the other clinical features and running a similar course. A saddle-back temperature, with a secondary peak on the fourth day accompanied by an exacerbation of symptoms, was noted in 10 per cent of cases.

The mouth and throat were normal, but many showed redness of the pharynx and soft palate. The chest was clear in 98 per cent of cases. One early case had marked headache with neck stiffness and a positive Kernig's sign, and was investigated for meningitis; the cerebrospinal fluid was normal and he recovered with no specific treatment.

Bronchopneumonia occurred in about 1 per cent of cases, and responded to penicillin injections. Several cases had persistent cough and nasal catarrh lasting up to ten days. Other minor complications were epistaxis and gastric disturbance.

Cases were treated by aspirin, and kept in bed until apyrexial for twenty-four hours. Fluid intake was encouraged, and no restriction was placed on food so long as the patient wanted it. Minor complications were treated symptomatically.

All cases were isolated in specially adapted barrack rooms. Reporting sick was encouraged so that cases could be isolated as early as possible. In spite of this, however, a number of mild cases did not report sick and no doubt contributed to the spread of infection. Mixing of personnel between the three camps was reduced to a minimum. Strenuous activities were discouraged. Training was modified to reduce excessive fatigue on the assumption that fatigue would predispose to infection and to increased severity of the illness.

The chief difficulty in the management of the cases was the serving of hot food to the patients in barrack rooms. The problem was overcome by grouping all cases in billets which were conveniently near a cook-house, and which were provided with heating and sanitation. The unit detailed special personnel for duties involving cleaning of billets, bed-making and feeding of patients.

Fifty per cent of patients were discharged on the third day, and 25 per cent on the fourth day. After discharge they were put on light duties for two days, by the end of which time the majority were fit to continue training. Convalescence was more prolonged in those cases who developed a saddle-back temperature.

B. Oswestry.

Captain G. H. Carriett, R.A.M.C., described an outbreak in two Royal Artillery regiments at Oswestry. He confirmed the previous speaker's experience that cases appeared simultaneously in widely separated billets, with no evidence of direct spread from one billet to another. The outbreak, which was now showing signs of abating, started in mid-September, and so far the morbidity rate had been approximately 20 per cent.
Although the onset was sudden in a number of cases, there was usually a history of malaise lasting from a few hours to a few days before the men reported sick. The commonest signs and symptoms were pyrexia, headache, backache, pain in the limbs, sore throat, coryza and cough. One case developed severe unilateral epistaxis, and there was one case of otitis media without perforation. Follicular tonsillitis occurred in four cases. Nasal catarrh and cough had been common sequela. One severe case became delirious and cyanosed within eight hours of onset, although he had very few physical signs in the chest: he was transferred to a civil hospital, where he made a reasonably rapid recovery.

The majority of cases responded favourably to symptomatic treatment, and were fit to return to light duties within four days. Patients were given ordinary cook-house meals, but lemonade powder was issued to make an increased fluid intake more palatable. Feeding problems had again arisen mainly in connection with the service of hot meals to patients nursed in barrack rooms.

Preventive measures, which were published in Regimental Orders, covered such points as bed-spacing, the prohibition of dry sweeping and shaking of blankets in barrack rooms, the washing of cutlery and crockery, ventilation of barrack rooms, and the use of a handkerchief to cover the nose and mouth when coughing or sneezing. Men were advised to avoid cinemas, public houses, dance halls and all other crowded places in Oswestry, where there was a concomitant outbreak of influenza among the civilian population.

THE DISEASE AS SEEN IN HOSPITAL

Captain C. G. B. Downie, R.A.M.C., Junior Specialist in Medicine, Military Hospital, Chester, described the clinical features of 194 cases (all Indians) admitted from the Indian cruiser I.N.S. Mysore, berthed at Birkenhead.

The onset was sudden, and nearly all complained of generalised limb pains and hot and cold sweats. About 20 per cent complained of definite joint pains, mainly in the large joints, sometimes of such severity as to raise the suspicion of acute rheumatism. Within an hour or two of onset a dry, irritating cough developed with retrosternal pain. The initial temperature averaged 101° F., the highest recorded being 105.6° F. About 30 per cent of cases showed a saddle-back temperature curve, with a remission on the second day, a second peak on the third day and a fall to normal on the fourth or fifth day. A notable diagnostic feature was an unnatural brightness of the eyes, with the sclerae slightly pink and the conjunctiva slightly swollen. Nasal catarrh was variable, but generally mucoid and rarely profuse. Labial herpes was noticed in some cases. The throat was slightly injected and granular in appearance, but there was no lymphatic gland enlargement. The more severe cases showed signs of meningismus during the first twenty-four hours.

Rest and aspirin were the mainstays of treatment, although some cases had to be taken off aspirin because of vomiting; this did not, however, seem to affect the course of the disease. Minor complications were treated symptomatically. Cases showing clinical signs suggestive of pneumonia were treated with two
mega units of penicillin daily, but only four cases showed radiological signs of consolidation. A purulent sputum was not considered an indication for treatment with antibiotics. White blood counts varied from less than 5,000 per cu. mm. in the uncomplicated case to 5,000-10,000 in those with purulent bronchitis, and over 10,000 in those with pneumonia.

GENERAL OBSERVATIONS ON CLINICAL FEATURES

Lieut.-Colonel F. B. Bagshaw, R.A.M.C., Officer in Charge, Medical Division, Military Hospital, Chester, referred to the rapidity of onset and the relatively high rate of infectivity as points in the differential diagnosis of influenza. He stressed, however, that the ultimate differentiation of the virus from that of other upper respiratory infections was dependent on laboratory confirmation.

In the past, various types of influenza had been described, depending largely on the severity of the infection and the complications which might occur. These were:

(a) Pyrexial. Mild cases with few, if any complicating features.

(b) Malignant. Fulminating infections with profound toxæmia, with the rapid development of the classical heliotrope hue and heart failure before there was time for local manifestations to appear. In such cases death might occur within twenty-four hours, and few would survive a week. It was this type which gave rise to the high mortality in the 1918 pandemic.

(c) Pulmonary. Some outbreaks might be characterised by the prevalence of respiratory complications. There was a progressive spread downwards of the catarrhal process with the production of bronchitis, bronchiolitis and alveolitis. The main feature was the development of pulmonary  œdema with the production of copious amounts of pink frothy sputum. In these cases examination might reveal many crepitations with diminished air entry, but only rarely would there be any impairment of the percussion notes. Secondary infection might occur, with the production of pneumonia, pleurisy and empyema. In those cases which developed pulmonary  œdema it was the  œdema rather than any possible co-existent pneumonia which was the lethal factor.

(d) Gastric. Cases with gastro-intestinal symptoms rarely occurred in epidemic form.

(e) Nervous. Nervous symptoms occurred as sequelæ rather than during the active phase of infection.

The following are some of the common sequelæ of influenza:

(a) Respiratory System. Sinusitis and bronchitis. There may be recurrent lung infection due to permanent lung damage which may form the starting-point of a future bronchiectasis.

(b) Cardiovascular. Toxic myocarditis may delay convalescence.

(c) Nervous Disorders. Post-influenzal depression and headache are the most common nervous sequelæ and resemble those following dengue fever.
Attention was drawn to the importance of being on the look-out for co-existent disease during an influenza epidemic: in particular cerebrospinal fever, encephalitis, poliomyelitis and such conditions as infective hepatitis and glandular fever. It was also important to remember that all pneumonias were not necessarily influenzal.

Considerable publicity had been given recently to the production of influenza vaccine. It must be remembered that immunity from an attack of influenza is relatively short-lived, and effective only against a virus of the same type and strain.

LABORATORY DIAGNOSIS

Lieut.-Colonel T. G. A. L. Warrington, R.A.M.C., Assistant Director of Pathology, Western Command, said that nowadays the term influenza is restricted to an infection caused by one of the specific influenza viruses A, B and C or their sub-groups. If the diagnosis of influenza were to be made purely on clinical grounds it would be impossible to differentiate it from a host of non-bacterial upper respiratory conditions, referred to by Stuart-Harris as “the general scrap-heap of respiratory infections.”

The role of the laboratory is twofold. On the one hand it helps the clinician to establish a diagnosis by the isolation and recognition of the specific virus concerned and to prescribe the appropriate treatment in cases where, unlike influenza, the virus is susceptible to antibiotics. On the other hand it helps the epidemiologist to trace the source and spread of the infection and enables him to decide on specific vaccine prophylaxis.

All laboratory procedures have two objectives in view:

1. The recovery of the virus during the acute stage from garglings or mouth washings, naso-pharyngeal swabs, and sputum (in cases of suspected pneumonia). After treatment with suitable bacteriostatic agents these specimens are injected into the amniotic cavity of a 13-day-old chick embryo, and four days later the amniotic and allantoic fluids are tested for the presence of virus.

2. The detection of specific antibodies in the patient’s serum by means of:

(a) Complement fixation tests (C.F.T.). This is the most suitable method for routine use.

(b) Haemagglutination inhibition test. This is based on the property of the influenza virus to agglutinate the red cells of fowls, guinea-pigs and human group “O” cells. This haemagglutinating property (not specific to the influenza virus) is inhibited by specific antibodies when these are present in a patient’s serum.

(c) Neutralisation tests, determined by the ability of serum (containing antibodies) to protect against the effects of virus when serum and standard suspensions of virus are inoculated into an experimental animal.

Specimens are collected as follows:

(a) For isolation of the virus: Pharyngeal washings or throat swabs are put into a buffered tissue culture medium, which is then kept at a temperature not
exceeding $4^\circ$ C. and should be sent to the laboratory, in the frozen state.

(b) For the detection of antibodies: Between 5 and 10 ml. of blood are collected in a dry sterile bottle. The serum is separated within twenty-four hours. Tests are carried out on paired sera. One specimen is collected within the first four days and a second specimen between the tenth and fourteenth day of the illness.

At autopsy, the manifestation of influenzal infection on the respiratory tract is a manifold one and varies in its severity and distribution. The picture presented ranges from a simple catarrhal inflammation limited to the nasopharynx to cases where the whole respiratory tract is affected by an intense inflammatory oedema with haemorrhages, fibrinous exudate and a variable degree of bronchopneumonic consolidation. An outstanding feature is the implication of the terminal bronchioles which are the seat of a marked interstitial inflammation. The role of secondary bacterial invaders is evidenced by purulent secretion, areas of softening, supplicative foci in the lung, and septicæmia.

(Note: By the end of October, Asian-type influenza virus had been identified from outbreaks in Brecon, Long Marston, Preston and Rhyl, as well as in the Indian cruiser I.N.S. Mysore.)

DISCUSSION

The following points were made in discussion:

(a) The periodicity of influenza epidemics.

(b) An interesting feature noted in the present epidemic was that there had been little if any loss of appetite, even at the height of fever.

(c) There is no known antibiotic effective against the influenza virus.

(d) Seriously ill patients should not be moved distances over ten miles. If soldiers have to be moved for admission to a Medical Reception Station the extra journey of a few miles to the nearest hospital would not have any further deleterious effects.

(e) The occurrence of silent pneumonia in influenza must always be borne in mind.

SUMMING UP

Major-General F. J. O'Meara, Deputy Director of Medical Services, Western Command, recalled that when working in the dissecting room between 1918 and 1920 the skin of several subjects was a heliotrope colour, which he had never forgotten. There was a very good description of that influenza outbreak, the "Spanish 'Flu" of 1918-20, in the official "History of the Great War" (1922).

The next time he encountered influenza was in the winter of 1932-33 in Catterick Camp, when many cases of meningococcal meningitis occurred at the same time. In France, in the grim winter of 1939-40, influenza was again prevalent, and this time was once more overshadowed by the high incidence of meningococcal infection. We were now confronted with this present outbreak
of Asian influenza. Thus in a working life spent among acute infectious disease, influenza had appeared approximately every ten years, namely 1918-20, 1932-33, 1939-40 and 1957-58.

General O’Meara indicated briefly the striking features of each outbreak.

**The 1918-20 Outbreak.** The main features were:

(a) Heliotrope coloration of the skin. This occurred in all degrees, from slight cyanosis to vivid purple.

(b) Acute suffocative bronchitis.

(c) High temperature (104° F.) and paralysis of one ocular nerve (3rd, 4th, or 6th), which heralded the onset of encephalitis lethargica, was not infrequently seen.

**The 1932-33 Outbreak.** This was characterised by:

(a) Acute suffocative bronchitis.

(b) Heliotrope coloration.

(c) Silent pneumonia.

(d) Silent massive effusions, streptococcal in origin.

(e) Staphylococcal pneumonia.

Some of the cases which on admission to hospital appeared to be influenza, subsequently proved to be acute myocarditis (now thought to have been due to Coxsackie virus, group B), Bornholm disease (also due to Coxsackie virus, group B), encephalitis lethargica or meningococcal meningitis (characterised by a posture of lying in flexion and by petechiae).

**The 1939-40 Outbreak.** The complications seen in this epidemic were:

(a) Pneumonia and

(b) Empyema, both mainly pneumococcal in origin and

(c) Meningococcal infection in every clinical form.

With regard to the present outbreak, he would not say what the coming winter held in store, but he thought the epidemic would be influenced by the mildness or severity of the weather.

**REFERENCES**


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