

## ACUTE UPPER RESPIRATORY INFECTIONS AND INFLUENZA

Although a large group of common diseases, the upper respiratory infections are a confusing mass of uncertainty in relation to their nature and their treatment. They are easy to recognize, since we all suffer from them annually, but there is no clear understanding of their causes and no good correlation between aetiology and clinical and investigative data. It is fortunate that most of the common respiratory infections are relatively benign in terms of morbidity, complications and mortality, and that they are self-limiting. Because of our lack of understanding of their causes no effective specific therapy or prevention is possible.

Classification also is difficult and in practice has to be on basic clinical lines.

1. Acute upper respiratory infections (coughs, colds and catarrh) and influenza
2. Catarrhal children
3. Acute otitis media
4. Acute throat infections

### Coughs, colds and catarrh

*What  
are they?*

In practice the majority of the common acute upper respiratory infections are probably caused by viruses, but, even with the most intensive and extensive tests, in less than 40% of episodes can any pathogenic organisms, viral or bacterial, be isolated.

Among the *viruses* stated to be responsible for these infections are:

- *Influenza* – that can only be diagnosed with accuracy during epidemics

- *Para-influenza* – endemic causing croup in children and also coughs and colds
- *Respiratory syncytial virus* – annual epidemics causing bronchiolitis and pneumonia in infants and upper and lower respiratory infections in children
- *Coronavirus* – common colds in children and adults
- *Coxsackie A and B* – febrile pharyngitis, colds, herp-angina and pleurodynia (Bornholm disease)
- *Rhinovirus* – common colds
- *Adenovirus* – upper and lower respiratory infections in children and in adults

Pathogenic *bacteria* do not have a specific primary role in the colds–coughs–catarrh syndrome but they may produce secondary infection. The most notable are *Streptococcus pyogenes*, *Pneumococci* and *Haemophilus influenzae*.

#### *Clinical features*

The respiratory tract is a single contiguous unit, but it is useful practice to separate the upper and lower levels because their diseases differ and have different significance in severity and course.

The common symptoms of sneezing, nasal discharge and obstruction, sore throat and cough accompanied by variable degrees of malaise, fever and general systemic upset have no correlation with the possible pathogenic viruses and bacteria.

Certain vulnerable individuals, such as respiratory invalids with chronic bronchitis, fibrocystic disease, and immune deficiency states and congenital and acquired heart disease, do run extra risks from the common upper respiratory infections.

#### *Course*

The natural course of these infections is for spontaneous resolution within 7–8 days. This course is uninfluenced by any form of therapy.

#### *Management*

These self-limiting and benign conditions should be treated with simple and safe non-specific measures. There are no specific *antibiotics* known to shorten the course of the illness or prevent complications. The place of prophylactic antibiotics even in vulnerable individuals is unproven.

*Antihistaminics* have not been shown to produce subjective symptomatic relief or any objective benefits.

*Local vasoconstrictive nasal drops or sprays* have, at most, a transient effect.

Each family has its own 'cold cures' and should be encouraged to use them. If the victim seeks medical aid then the wisest therapeutic measures are:

- simple analgesics
- simple linctuses
- simple inhalants
- simple reassurance and advice to wait for a natural resolution.

## **Influenza**

### *What is it?*

Influenza, 'the influence', is an overall description of a syndrome that comprises a number of different entities.

Applied loosely and non-specifically, it is descriptive of sudden symptoms of infection of the respiratory tract accompanied by variable degrees of malaise. There are many possible causes of such conditions, including a wide range of viruses and bacteria, allergic reactions and possibly psychosomatic responses in certain individuals.

More accurately, influenza is the clinical condition that results from infection with influenza viruses. Whilst blood spread viraemia does occur, the main effects of the influenza viruses are on the upper respiratory tract, the nose and throat, with possible spread and involvement of the lungs and bronchi.

The importance of influenza lies in its potential to cause widespread epidemics and pandemics affecting sizeable proportions of a population at any time, leading to disruption of life and work, and deaths. Although the case fatality rates in most epidemics are not high, the very large numbers of cases inevitably lead to many deaths in vulnerable groups.

It is the epidemic nature of influenza that picks it out from amongst the many other respiratory tract viruses. The reason for this is the ability of the influenza viruses to change their antigenic structure so that each new strain faces human beings with almost new organisms against which they have little previous immunological experience and resistance.

The challenges of controlling and managing influenza epidemics are in possible prevention through a potent vaccine, prophylaxis and protection of vulnerable groups and organization of services during an epidemic.

Records of influenza-like epidemics go back to early history. During the past four centuries it is probable that there have been thirty world pandemics of influenza. These pandemics have been in addition to the many more local, but nevertheless disrupting, epidemics that come rather unexpectedly every 2–3 years.

The pandemic of 1918–1919 was estimated to have caused 20 million deaths amongst 700 million clinical cases, a very high fatality rate of 30 per 1000. In the United Kingdom the influenza epidemic of 1957 with a new strain of the A2–Hong Kong influenza virus infected up to 10 million cases out of a population of 56 million, with 5000 deaths (case fatality of 0.5 per 1000), and the cost to the nation was more than £100 million. (The cost now would be £1500 million!)

### *Causes and effects*

The influenza viruses were ‘discovered’ in 1933. They belong to the myxovirus group. The types are recognized as influenza A, B and C. Each is little related antigenically to the others and there is only partial cross-immunity between them. Each behaves in a characteristic epidemiological manner. Influenza A is the most malignant type, responsible for all major epidemics and pandemics. Influenza B can cause less severe but locally widespread epidemics and influenza C has so far caused only minor sporadic epidemics in closed communities.

The onset and rapid spread of influenza leading to large epidemics is related to the antigenic strain of the virus and to the prevailing host mass immunity. Following an epidemic the mass immunity rises and remains high for 2–3 years. After this period the locality often experiences a further epidemic. It is uncertain whether this liability is related more to a falling immunity or to the new antigenic strains of the influenza viruses. What is well known is that there is a definite variation in individual susceptibility to infection with influenza. Some individuals appear never to ‘catch flu’ whereas others go down with each epidemic.

Influenza viruses cause damage to the epithelial lining of

the respiratory tract and lead to secondary bacterial infections with bacteria, such as acute bronchitis, bronchiolitis and pneumonia.

These effects are more serious in those with already damaged cardiovascular or respiratory systems. These include cardiac and respiratory invalids, and the very young and the elderly.

*Influenza in a general practice 1947–1985*

During the period 1947–1985 there were fourteen notable epidemics of influenza in the practice. Each epidemic had its own character but in all there was a common pattern of onset, progression and remission.

The periodicity of these epidemics (Figure 6.1) shows a remarkable and almost constant 2–3 year cycle.

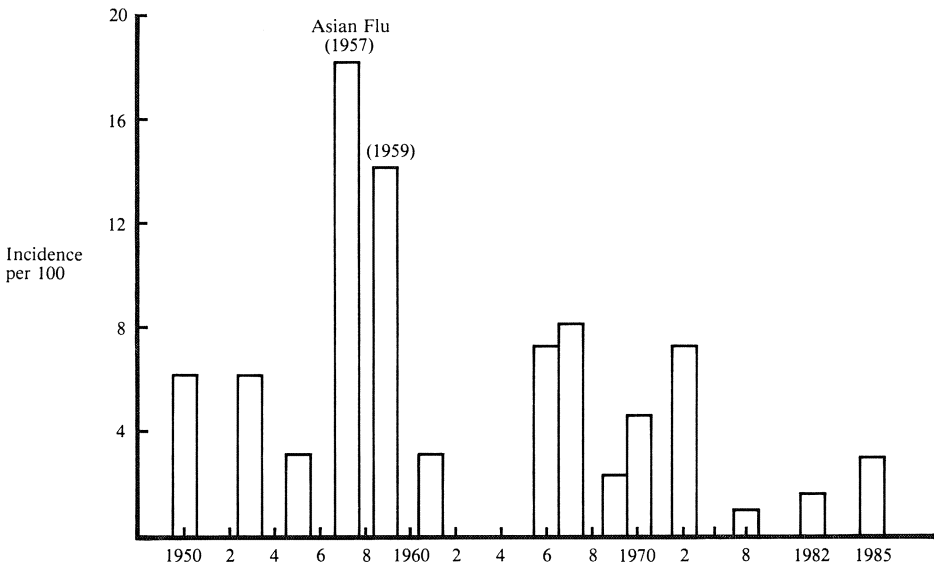


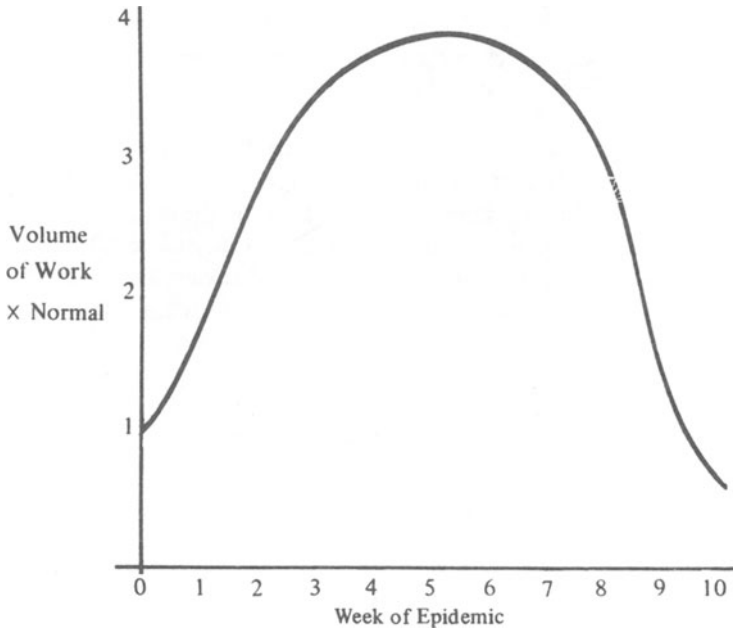
Figure 6.1 Influenza epidemics 1947–1985 – incidence per 100

*The effects of an influenza epidemic*

The threat and eventual onset of an epidemic of influenza is a continual nightmare to the community.

Extending over a period of 8–10 weeks (Figure 6.2), the epidemic arrives rather insidiously with a few sporadic

cases, often in the late autumn or early winter in a temperate area. By the end of the second week requests for home visits and consultations mount rapidly and are at 3 to 4 times the normal volume. Whole families and other close communities go down with the infection within a short period.



**Figure 6.2** An influenza epidemic – effects on volume of work

As a rule schoolchildren are the first group to be affected, followed by their families at home. Young adults are particularly susceptible and the elderly may escape or become affected only in the later stages. However, each epidemic has its own characteristic pattern of age involvement depending on the past experiences of the population and its vulnerability to the strains of infecting influenza virus.

The peak of the epidemic is reached in 2–3 weeks and this high level of new cases may remain for a further 2–3 weeks followed by a gradual decline over the following few weeks.

In practice not only are the patients affected but the medical and associated staff are at risk and so is the physician's own family. All this adds to the strain, chaos

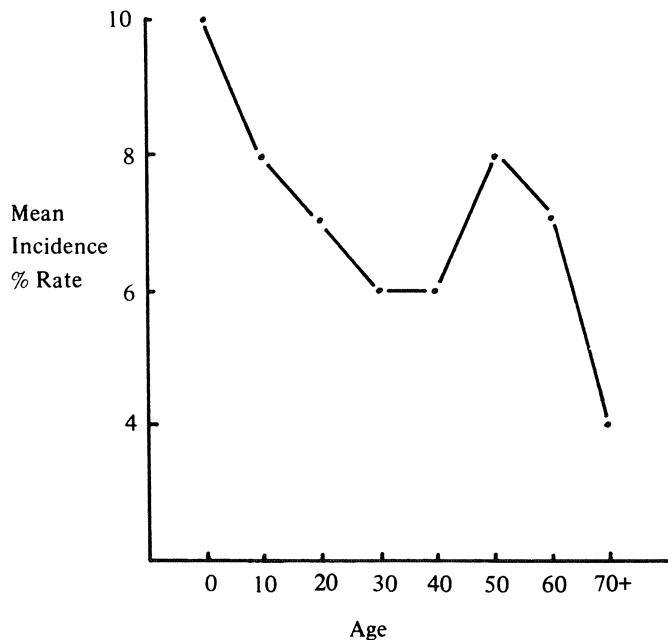
and pressure. During this time the normal work and care are under severe stress and it is important to guard against erroneous and faulty clinical decisions and actions on non-influenzal cases. Not all acute diseases that present during an influenza epidemic are 'influenza', and acute abdominal emergencies, heart attacks and other emergencies still have to be picked out from amidst the mass of influenzal victims.

The extra strains affect the hospital, welfare and other public services also, and special emergency plans have to be ready to be implemented during such periods.

### *Frequency*

The incidence of influenza in the practice as measured by those persons seen and diagnosed during each epidemic, using the same clinical criteria, is shown in Figure 6.1.

The highest incidence occurred when the A2-Hong Kong strain of influenza virus caused the epidemics in 1957 and 1959. It was a new strain and affected a relatively unprotected population causing an incidence of cases consulting the family physician as high as 17 and 14 per 100 in 1957 and 1959 respectively. In the other ten influenzal epidemics the incidence rates of physician-consulted cases was around



**Figure 6.3** Influenza – age incidence per 100 at risk

5 per 100 at risk. In all these epidemics the true incidence was 2–3 times these consultation rates, since many persons treated themselves without consulting the physician.

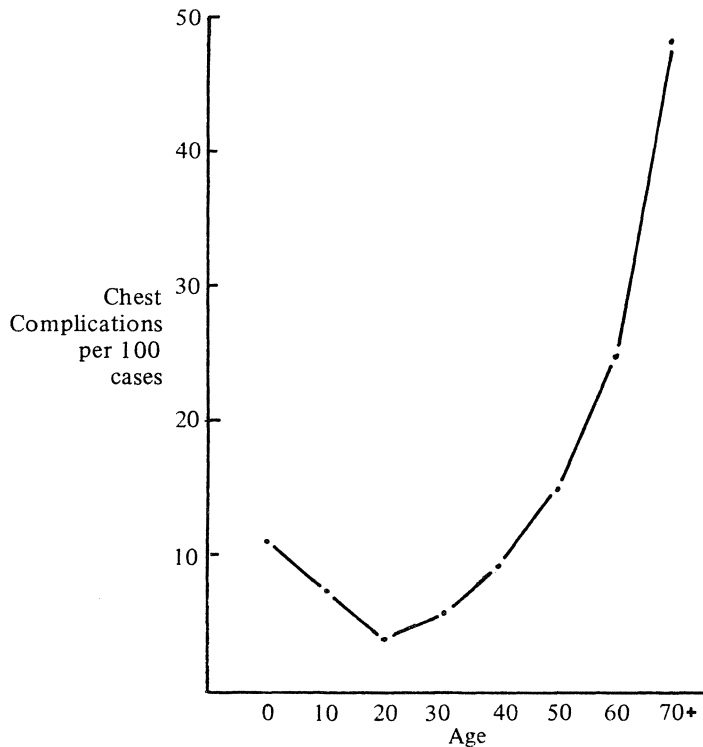
*Who was infected?*

Whilst each influenza epidemic has its own characteristic age distribution, in the major epidemics of 1957 and 1959 children and young adults were most often affected. However, taken overall, the mean rates in all the epidemics show a fairly even distribution, apart from a low incidence rate in the elderly (Figure 6.3).

*Complications*

The major complications noted in these epidemics were chest infections. Figure 6.4 shows that overall in all the epidemics 13% of those seen for influenza had chest complications. Of these 8% were pneumonia and 5% acute bronchitis.

Thus, although influenza is not highly prevalent in the elderly, they are most prone to suffer chest complications.



**Figure 6.4** Influenza – chest complications at various ages per 100 cases



In these 14 epidemics the case fatality rate was 2 per 1000. Thus, epidemic influenza during the period of observation in this particular practice was not a particularly mortal condition.

### *Diagnosis*

'Flu' can become a convenient garbage-can type of loose and imprecise diagnostic term that offers a quick and ready label for the victims of a multitude of common respiratory infections. These infections of the respiratory tract are endemic and present almost every day in every community. Those that happen sporadically to be caused by influenza viruses outside epidemics are no different clinically from similar syndromes caused by many other viruses. It is only during an epidemic of influenza that the diagnosis of influenza becomes accurate.

The diagnosis of influenza can be confirmed either by isolating and culturing influenza viruses from throat swabs or garglings, or through a rising titre of serum antibodies in two specimens at least two weeks apart following recent infection.

Such confirmatory investigations may be useful during the early stages of an epidemic to detect the causal strain of influenza virus or during special research studies. They are of little practical value for normal practice.

### *Clinical features*

The clinical spectrum of influenza is broad. The range is from subclinical infections with no symptoms, recognized only through evidence of rising antibody titres, through various degrees of severity of respiratory infections with classical features to a fulminating variety, fortunately rare but potentially fatal within a few hours. Such severe cases were not infrequent during the great pandemic of 1918–1919, but have been rare since then.

The clinical features will depend on the age of the patient and on the previous medical history. In children and the elderly dramatic and acute illness is not customary but rather a more slowly progressing infection of the respiratory tract.

It is in young adults and in the middle-aged that the classical picture is found of an onset of abrupt suddenness, timed almost to the minute, with severe malaise, fever and respiratory symptoms. Aching of the limbs and back is characteristic. Headache may be severe and accompanied

by vomiting. There is unpleasant aching behind the eyes, described as though the eyes were 'on stalks'. The cough is dry and irritating at first, becoming productive of mucoid or mucopurulent sputum later. The eyes are red and there is nasal stuffiness and discharge. Sweating may be profuse and drenching.

The course in uncomplicated cases is for a slow improvement over some days, but there may be a profound feeling of weakness, malaise and depression for some weeks, without any evidence of complications. Post-influenzal debility and depression is a very real condition.

Not infrequently the course may be interrupted by an apparent relapse, with a recrudescence of symptoms, the so-called M-pattern with two peaks of clinical disturbance.

*Clinical complications*

The mortality from influenza during the period 1947–1985 in my practice was low, 2 per 1000 of patients seen and treated. Since large numbers did not seek medical attention during the epidemic periods the true mortality rate from influenza must have been around 1 per 1000.

Of the eight who died, six were over 70 and frail with histories of previous chest infections. The other two who died were a man of 50 with hypertension, who died from cardiac failure, and a woman of 54, a chronic bronchitic, who died from cor pulmonale.

The most frequent complications were acute bronchitis and pneumonia and occurred in 13% of those seen with influenza. The young (under 10), the elderly (over 60) and those with previous cardiac or respiratory disorders were most likely to suffer chest complications.

The clinical picture of chest complications was not that of a dramatic and acute illness but rather that of a prolongation of the original illness with continuing productive cough with mucopurulent sputum, with persisting malaise and with abnormal physical signs in the chest, confirmed by radiography.

The abnormal physical signs were predominantly of two types. Diffuse wheezy rhonchi were noted in one-half of those with chest complications, denoting a widespread bilateral bronchial infection. In most of the others there was a localized area of diminished air entry with inspiratory moist rales at one or other base, denoting a localized infection of the lung.

The response to antibiotics was slow but satisfactory. The acute bronchitic condition responded and cleared more rapidly than did the localized pulmonary infections. In the latter the abnormal chest signs and radiographs often took some weeks to clear completely, although the patient was well in health.

Acute otitis media, sinusitis and laryngitis were occasional complications. Otitis media was most frequent in children, whereas sinusitis and laryngitis were noted only in adults.

Encephalitis and other neurological complications were not seen.

*Management*      The rational management of epidemic influenza requires attention to a number of facts.

1. Epidemics of influenza will almost certainly continue to occur indefinitely at intervals of a few years. There are few prospects of any public health or personal measures that will achieve the control of influenza that has been achieved with poliomyelitis and some other infections.
2. Because of the widespread extent of influenzal epidemics, national, regional and local planning are required to enable family physicians to manage the sudden increase of the illness and its complications within the community and to prepare for increased demands on hospital and social and welfare facilities. Emergency plans should be ready for influenza epidemics.
3. The changing antigenic structure of the influenza viruses makes the production of an effective vaccine difficult. It is not feasible to immunize the whole population every few years. It may be justifiable to immunize at-risk groups.
4. At present, although widespread and distressing, influenza is a relatively benign infection with few complications and a low mortality in otherwise healthy people.

*Preparations for an influenza epidemic*      There is usually a period of warning and expectation before an influenza epidemic arrives. Its effects will be a dramatic increase in the volume of work for the family doctor and his practice must be mobilized.

Plans should be prepared to arrange for social welfare procedures such as medical certification of sickness, home nursing of the elderly and isolated, and possible anticipatory home visits to known vulnerable disabled.

Arrangements for facilitating possible hospital admissions must be made and it is a good plan for local hospital specialists and family physicians to discuss the management of the epidemic before it arrives.

### *Patient care*

In the great majority of cases, influenza is a benign self-limiting infection with no specific remedies, but measures are available for relief of the symptoms.

These should be announced publicly and everyone's collaboration invited. The normal course of the infection over 4–5 days followed by a slow improvement should be described to the patients and possible complications noted.

For the uncomplicated cases simple measures such as hot drinks, linctus and analgesics to relieve the aches and discomfort are all that is required.

For those with complications, such as pneumonia and bronchitis, more specific therapy is available. It should be assumed that these infections are caused by secondary bacterial infection with antibiotic sensitive organisms.

A policy should be developed for the use of antibiotics. In the community broad spectrum antibiotics such as ampicillin or cotrimoxazole are probably the most useful.

### *Prophylaxis*

It has been suggested that those with a history of chest infection should commence taking antibiotics before the epidemic arrives.

This rationale is not to be recommended in practice. It is best to wait and see whether influenza develops and then whether chest infection follows.

### *Prevention*

Vaccines against influenza are available and some industrial and public organizations encourage their employees to have annual inoculations. The value of such procedures has never been confirmed.

It is suggested also that certain vulnerable groups such as cardiac and respiratory invalids and elderly persons be immunized. There is no proof of efficacy.

**Practical points**

- Coughs and colds are clinical manifestations of a wide range of viruses.
- Many persistent 'colds' are due to a hypersensitive nasal mucosa (vasomotor rhinitis).
- 'Flu' is a convenient label for non-specific short-term febrile respiratory infections.
- 'Influenza' should be restricted to epidemics caused by influenza viruses.
- Epidemics of influenza occur every few years. Their extent and virulence depend on the antigenic strain of the virus.
- With up to a quarter of the population being infected during an influenza epidemic, the effects on a community and general practice are dramatically chaotic.
- Arrangements and plans should be made to cope with the epidemic before it arrives.
- Most attacks of influenza are benign, case fatality is low (2 per 1000). Chest complications occur in about 15 per cent – mostly in elderly.
- Symptomatic measures are appropriate, antibiotics should only be used when secondary complications occur.
- Preventive immunization on a wide scale is unproven, and that of vulnerable individuals is reasonable but uncertain.