AN OUTBREAK OF "HONG KONG 'FLU" IN SINGAPORE

PART I — CLINICAL STUDY

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The influenza viruses which fall into the category of myxoviruses are divided into three main types A, B, and C. Each type has variants, and numerous variants exist. Influenza epidemics have been known to occur since the 14th or 15th century at intervals of about 25 years with minor epidemics at approximately 5 year intervals. This regularity stopped in 1940 but minor epidemics have occurred everywhere since 1933 (Fishbein, 1957). It was in 1933 that the influenza virus was first identified. Of all the known epidemics the 'Spanish flu' that spread throughout the world in 1918 was the most serious and devastating because it was known to have taken a toll of about 20 million human lives (Fishbein, 1957). The exact virus which caused that pandemic is not known but most of the deaths caused by it were attributed to secondary bacterial invaders. The last two major pandemics occurred in 1947 and 1957. In Singapore, Asian (A2) influenza virus has been isolated on several occasions since its first appearance in 1957 (Lim *et al*, 1957). Influenza B isolates were first identified in Singapore in 1963 (Yin-Coggrave *et al*, 1965). Of the three, virus C is the least pathogenic and produces only minor sporadic infections mainly in children and therefore comes under least scientific scrutiny.

Of all the conditions encountered in the medical practice at the University of Singapore Clinics through any year, various virus infections of upper respiratory tract constitute the commonest disease entity. Sporadic cases of respiratory infection of varying severity are seen virtually throughout the year; but they are generally mild and short-lived. Isolated cases of influenza in daily medical practice cannot be recognised without proper laboratory studies, for the definitive diagnosis can be made only through virus isolation in the acute phase or by comparing titers of serum antibodies from the patient when he is acutely ill and when he is convalescent. At the beginning of August 1968, when a sudden spate of patients started reporting for rather prostrating symptoms suggestive of influenza, in view of the earlier reports of influenza outbreaks in the Far East, it was decided to investigate and identify the causal virus (Part II virological study by Yin-Murphy, M.)

CLINICAL MANIFESTATIONS

In all 522 students and 443 members of non-academic staff, their wives and children were seen and treated in the University Health Clinics for the disease during the period from early August to early September 1968. The usual course of febrile illness was four to five days. In majority of cases it ran a biphasic pattern, that is to say the disease was interposed by an interval of 24 to 36 hours during which patients felt as if they were on their way to recovery. This was generally followed by fatigue and lethargy for durations varying from five to ten days. The temperatures ranged from 99.4°F to as high as 104.5°F.

TABLE I

ANALYSIS OF CLINICAL MANIFESTATIONS (965 CASES)

Symptoms	Frequency in percentage	Symptoms	Frequency in percentage
Fever	100	Chest pain	35
Headache	85	Anorexia and nausea	72
Giddiness	10	Ear-ache	5
Bodyache	80	**Signs**	
Lassitude and lethargy	78	Inflamed throat	100
Cough	88	Injected eyes	17
Nasal catarrh	79	Palpable sub-mandibular lymph glands	81
Painful eyes	42	Bronchitis	8

The frequency of the syndrome's clinical manifestations is given in Table I. It is evident that all cases who could articulate medical his-

tory complained of fever with chills or shiverings. Eighty-five per cent complained of headache, and eighty per cent varying degrees of pain in muscles or bones. All the cases suffered from dry or productive cough of varying intensity for days after the actual febrile illness had subsided; a few also had traces of blood in sputum. Rhinorrhoea and stuffiness of nostrils were prominent in seventy-nine per cent; two persons even complained of small nose-bleeds. Ocular symptoms in the form of pain mainly on movements of eye-balls were found in forty-two per cent. The striking feature of this outbreak was the dominance of gastric symptoms of severe anorexia and nausea during the early stage of illness reported by seventy-two per cent of cases, some of whom experienced attacks of vomiting. While ten per cent complained of feelings of dizziness, three individuals gave history of actual spells of fainting.

On physical examination, conjunctival injection was noticed in seventeen per cent. Redness and swelling of the pharyngeal wall and of the tonsils were the positive findings in all the cases; a few also showed purulent exudate on the pharynx or tonsils indicating secondary bacterial infection. Enlarged tender lymph nodes in the submandibular region were palpable in eighty-one per cent of cases. Except rapid heart rate in majority of cases and functional systolic murmur over the precordium in a few, the cardio-vascular system was regarded as clinically normal in all. On ausculation of lungs, eight per cent of cases revealed signs of bronchitis. However, as no chest X-rays were obtained, it was not possible to ascertain whether cases with positive lung signs had concomitant radiological evidence of pneumonitis or consolidation. In any case, all our cases eventually made uneventful recovery with treatment as outpatients and none was required to be hospitalised. Blood studies carried out on those cases referred for isolation of virus showed on an average slight drop in total white cell count with relative rise in the percentage of lymphocytes.

EPIDEMIOLOGY

Unlike the last outbreak of Type B influenza in 1963 (Yin-Coggrave *et al*, 1965) the one reported here produced greater morbidity and was more widespread. The latter impression was borne out by the finding (Table II) that out of 3,358 students and 1,675 non-academic staff and their dependents on the Health Service panel in 1968, 965 individuals were struck with the infection; thus the overall attack rate was 19.2 per cent. The prevalence rates in male and female students were 16.8 per cent and 12.8 per cent respectively, whereas in adult members of staff and their wives it was 36.4 per cent. This significant disparity in the incidence of morbidity between staff and students could partly be ascribed to the fact that the category of staff treated at University Clinics mostly belong to socially and economically under-privileged class. As their physical and nutritional standards are not as high as those of university students and as their living conditions are usually quite crowded they are more susceptible to contracting this type of infection. Mostly children, because of relative lack of resistance to causal virus suffered from more pronounced reactions of high body temperatures, severe cough for several days, lung signs in the form of bronchitis and bouts of vomiting.

TABLE II

PREVALENCE RATES OF INFLUENZA IN THE UNIVERSITY

University Students	Number Eligible for Treatment in 1968	Presumed Cases of Influenza
Male	2,300	387 (16.8%)
Female	1,058	135 (12.8%)
Non-Academic Staff		
Adults (Male and Female)	785	286 (36.4%)
Children	890	157 (17.6%)
TOTAL	5,033	965 (19.2%)

The outbreak of the newly recognised virus in the University and State of Singapore could be traced to its source in Hong Kong where the epidemic first raged during the latter half of July 1968. Irrespective of whether the new variant A2/Hong Kong/68 emerged de novo in Hong Kong or it just happened to be detected there first from imported cases from elsewhere, there is no doubt that the outbreaks spread rapidly to Singapore, other South-East Asian and Middle East countries and Japan. The virus was also transmitted, perhaps through the American military personnel or the tourists, to the west coast of the United States and Australia. According to the Weekly Epidemiological

Record of the World Health Organisation (1969, 44, 1-28), cases affected with same virus were also reported in the United Kingdom in October 1968. During the initial stages the outbreaks pursued such relentless courses that they came close to assuming pandemic dimensions. However, at the time of going to the press the major wave seems to have fizzled out or been contained in some western countries by mass immunisation programmes. Nevertheless, some countries remain concerned that this new virus may regain its original virulence and momentum and involve their populations.

COMMENTS

From the mortality point of view the present day influenza outbreaks may not constitute serious threat to populations at large as used to be the case in the past. Nonetheless, in terms of morbidity and loss of working men hours they still continue to pose major health hazard. In the absence of specific anti-viral drug therapy, the only valuable weapon available to the medical profession at this stage is preventive in the form of mass immunisation of susceptible populations. However, for this measure to be effective the vaccine has to possess proper antigenic properties of the threatening virus and it should be administered in time for the immunity to develop. In view of the extent and rapidity of modern travel and the very short incubation period of disease the outbreaks spread fast and spill over easily from one country to another. It is, therefore, important that practising physicians always remain alert to influenza-type illness among their patients. Even though the disease is not notifiable, prompt information passed to local health authorities or experts in virological studies who have contacts with laboratories operated by World Health Organisation for the early detection of influenza can serve a very valuable function of preventing the spread of disease from one country to another and its assuming full scale epidemic dimensions.

SUMMARY

An analysis is provided of 965 cases of Hong Kong 'Flu seen in the student and staff community of the University of Singapore during the four weeks period in August and September 1968. The illness was characterised by severe constitutional, upper respiratory and gastric symptoms. Severity of infection was marked in children. The usual course of febrile illness was four to five days. Involvement of lungs in the form of bronchitis was detected in eight per cent of cases all of whom were below 20 years. No major complications were noted and no hospitalisation was required; case fatality in the series was none. The overall attack rate was 19.2 per cent. The prevalence rate of disease in university students was 15.6 per cent, while in other adults it was 36.4 per cent.

REFERENCES

1. Fishbein, M., (1957): "Influenza Asian (Editorial)." Postgraduate Medicine, Vol. 22, 439-441.
2. Lim, K.A., Smith, A., Hale, J.H., and Glass, J., (1957): "Influenza Outbreak in Singapore." Lancet, ii, 791-796.
3. W.H.O., (1969): "Weekly Epidemiological Record," 44, 1-28.
4. Yin-Coggrave, M., and Kadri, Z.N., (1965): "Type B Influenza in Singapore." Singapore Medical Journal, Vol. 6, No. 2, 71-74.