John W. Nuzum, Isadore Pilot, F. H. Stangl, and B. E. Bonar, “Pandemic Influenza and Pneumonia in a Large Civil Hospital”

Source: Journal of the American Medical Association 71 no. 19 (Nov. 9, 1918), 1562–1565.

Following the reports of a rapidly spreading and highly fatal pandemic of influenza and pneumonia in the Eastern States, and while the epidemic of influenza was raging at the Great Lakes Naval Training Station, a severe outbreak of this disease appeared among the civil population of Chicago. During the past five weeks, from September 23 to October 29, more than 2,000 patients were admitted to the wards of Cook County Hospital. Of these, 642 died, a mortality of 31 per cent. . . . The age period of highest mortality falls between 25 and 30 years.

Among the total number of admissions during this period there were 122 soldiers, and thus far twenty-one cases have terminated fatally—a mortality of 16 per cent. So far as the admissions to a large charity institution, such as the Cook County Hospital, may be regarded as an index to the prevalence of the recent epidemic in Chicago, it appears that the disease is now definitely on the decline. Accordingly, it seems pertinent to report the results of an intensive study conducted during the past five weeks in the morgue and the laboratory of the Cook County Hospital.

Clinical Picture
The incubation period varied from a few hours to one or two days. Shortly after the arrival of the first fifty soldiers, five of the nurses in attendance on these patients became violently ill, and during the following two weeks more than fifty nurses and twelve of the resident physicians contracted the disease. Three of the nurses died. Blood cultures, nasopharyngeal and tonsil swabs and cultures of the washed bronchial secretions were immediately taken by the laboratory staff, and four of the laboratory assistants were suddenly taken ill within the next forty-eight hours.

The onset is sudden, with complaint of severe headache, dull, aching pains in the muscles and joints, general weakness and quite commonly dull pains in the lumbar region. Sore throat is unusual. The patient takes to bed with chilly sensations, and the fever rises rapidly from 101 to 104 F. Early prostration is the rule. Epistaxis [nosebleed] occurs in a considerable number of patients, in one person as much as a pint of bright red blood gushing from the nostrils. The pulse is accelerated and the respirations vary from 20 to 36 a minute. The second to the fourth day marks the critical period for the average patient. Remissions may occur, but among our cases more frequently following the crisis the temperature rises rapidly again and a slight bronchial cough develops, productive of small amounts of thick yellow or yellowish brown sputum teeming with gram-positive encapsulated pneumococci. There can be no doubt that the bronchial secretions are highly infectious at this time and that the disease is transmitted by personal contact and by droplet infection occasioned by coughing and sneezing.

Moreover, very early after the onset, careful physical examination of the patient’s chest will often reveal scattered rales [rattling sound] with areas of consolidation over the lower lobes and especially the right lower lobe. The bronchopneumonic process begins as an intense acute
hemorrhagic tracheobronchitis, rapidly extending to the finer bronchioles of the lung. In the acute fulminating cases the patients become markedly cyanosed [turn blue], and death results from an asphyxiative bronchiolitis with large quantities of frothy blood-tinged fluid exuding from the mouth and nostrils. . . .

[In sections entitled Morbid Anatomy, Bacteriologic Findings, and Experimental, the team gives detailed description of analyses made through autopsies, laboratory analysis, and experimental injections of material from flu patients into healthy volunteers. The findings are outlined in Summary, below.]

Complications and Sequelae
During the past five weeks of the present epidemic there were eighty-six pregnant women admitted to the obstetric wards of the hospital affected with influenza or pneumonia. Of this number twenty-one died shortly after miscarriage. Twenty additional deaths occurred before miscarriage could result, and forty-five patients recovered with or without miscarriage. The total maternal mortality has been 45.5 percent.

Among other complications of the disease, eleven patients have developed a unilateral or bilateral purulent otitis media [middle ear infection]. . . . One child developed an acute and fatal mastoiditis. Purulent frontal sinusitis was encountered in one instance at necropsy [autopsy], and cultures yielded pure hemolytic streptococci. It is to be expected that sequelae of still more diverse nature may subsequently develop.

Summary
A severe and rapidly spreading epidemic of influenza and bronchopneumonia first appeared at the Cook County Hospital, September 21. During the past five weeks more than 2,000 patients were admitted to the hospital. The disease is highly contagious, and the mortality among our patients has totaled 31 per cent. The epidemic has seriously crippled the medical and more especially the nursing staff of the hospital. More than fifty of the nurses and twelve of the physicians have contracted the disease, three deaths occurring among the total number.

The influenza [Pfeiffer’s] bacillus was isolated in only 8.7 per cent of the total cases and chiefly from a small number of soldiers. . . Influenza bacilli were isolated only exceptionally from the civilian patients. Pneumococci were the predominating organisms in the sputum, throat cultures and in the lung cultures both during life and at necropsy. Pneumococci of unusual virulence were the most important early secondary invaders, and have sufficed to cause many of the fatal pneumonias.

Experiments indicate that the disease is apparently not due to a filterable virus. [Like other experimenters of the time, the Cook County team was unable to produce influenza in healthy volunteers by injecting them with filtered material drawn from patients with flu.]

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