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Notes on Preventive Medicine for Medical Officers, United States Navy.

DEPARTMENT OF THE NAVY,
 BUREAU OF MEDICINE AND SURGERY,
 Washington, D. C., August 9, 1918.

INFLUENZA.

Recent reports from Spain, Austria, Germany, Switzerland, France, Great Britain, Hawaii and elsewhere, indicate the presence of another pandemic of influenza similar in extent to others which have been reported since the sixteenth century. There have been four pandemics succeeded by epidemics during the last century, the last one occurring 1889-1892.

No other communicable disease which assumes epidemic proportions spreads so rapidly or attacks indiscriminately so large a proportion of the population; therefore while the statements in the press that 8,000,000 persons have been attacked in Spain alone may be an exaggeration, it is probably nevertheless true that there has been a wide prevalence of the disease.

Past epidemics have been characterized by a profound prostration out of all proportion to the intensity of the disease; hence it is not improbable that the disease has impaired for a time the efficiency of the enemy's army as has been reported.

In answering the question as to the relationship of epidemic influenza to the ordinary catarrhal fever or "grippe," Osler quotes Leichtenstern's divisions (Nothnagel Handbuch):

- (a) Epidemic *influenza vera* caused by Pfeiffer's bacillus.
- (b) Endemic-epidemic influenza caused by the same organism which often follows a pandemic.
- (c) Endemic *influenza nostras*, pseudo-influenza, or catarrhal fever, commonly called *grippe*, which is of unknown origin and bears the same relation to true influenza that cholera nostras bears to Asiatic cholera.

The present outbreak appears to be characterized by a peculiarly sudden onset, the victim being struck down with dizziness, weakness, and pains in various parts of the body, while on duty or in the street.

There is a sharp rise in temperature to 103° or 104°, complaint of headache, pain in the back, and photophobia. The throat feels sore; there is congestion of the pharynx, and in some instances laryngitis and bronchitis. Lateral nystagmus with suffused conjunctivæ, a sign to which Maj. Morris, R. A. M. C., has drawn attention in trench fever, is not rarely found in the influenza patient.

In many cases the fever falls in three or four days and the patient recovers rapidly; in others there is an irregular pyrexia which may be accounted for by bronchitis; in rare cases by bronchiolitis, broncho-pneumonia, or by the presence of influenza bacillus in the blood. Few fatalities have been reported so far. The usual mode of death has been acute bronchiolitis with increasing cyanosis and terminal failure of the right heart.

The many serious complications and sequelæ which characterized the epidemic of 1889-1892 have not been common so far here or in Great Britain. In fact, the absence of such complications has caused some skepticism as to whether the disease really is *influenza vera*. Capts. Little, Garofolo, and Williams, of the Canadian army, have reported the finding of a diplococcus, *B. influenzae* being absent. Press reports, however, indicate a severe type in Switzerland, and the Pfeiffer bacillus is being found in other localities. Fortunately the outbreaks in our Navy have all been relatively mild in character and have caused no serious damage.

Causative organism.—In some cases the throat swabs show typical groups of influenza bacilli directly as well as on culture. Generally swabs taken from the pharynx show a varied bacterial flora with pneumococci and what appear to be pneumo-bacilli predominating; often no influenza bacilli are obvious. This has been the case in other epidemics. Cultures are said to indicate that the pneumo-bacilli are aberrant types of the influenza bacillus which is very polymorphic.

The Pfeiffer organism grows only upon media containing hæmoglobin, preferably upon agar slants smeared with blood rather than a mixture of blood and agar. Colonies are minute

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dewdrop points, appearing to run into each other. The organisms are very small Gram negative bacilli which stain faintly compared with cocci and tend to bipolar staining, thus appearing as diplococci. In sputum they tend to clump. Gram's method, counter staining with formal violet, is excellent for their demonstration (Stitt).

Incubation.—Osler gives the incubation period of influenza as "from one to four days; oftenest three to four days." "The onset is usually abrupt, with fever and associated phenomena."

During the present epidemics the period, as determined from bed to bed onset in hospitals, has been 48 hours or less.

Mode of transmission.—Despite popular opinion that "grippe" spreads over the world in some mysteriously rapid manner it never spreads, as Osler points out, more rapidly than methods of transportation. It is true, however, that the influenza bacillus is probably constantly present in the respiratory passages. The disease is highly communicable and during epidemics it spreads with remarkable rapidity. Just what conditions or combination of circumstances are necessary to start one of the periodic world-wide outbreaks is as unknown in this as in other communicable diseases like plague, which are prone to become pandemic. The sources of infection are undoubtedly the secretions from the nose, throat, and lungs of cases or carriers, and the mode of transmission is by direct or indirect conveyance of those secretions by droplet infection or by means of handkerchiefs, towels, eating utensils, etc. That the disease may be controlled under suitable conditions was shown by many instances of institutional isolation in the height of the epidemics of 1889-1892.

Control in the Navy.—Quarantine and isolation are impracticable on account of the wide distribution of the organism in healthy persons and the number of unrecognizable cases. Patients, however, should be put to bed at once, and bed isolation, prevention of droplet infection, and prompt disinfection of mess gear, handkerchiefs, etc., practiced as in measles. Where sick bays or wards are not available for isolation, the use of sheet screens between patients is to be recommended.

Treatment.—Rest in bed, warmth, fresh air, abundant food, with Dover's powder for the relief of pain. Every case with fever should be regarded as serious and kept in bed at least until defervescence of the fever. Convalescence requires careful management to avoid serious sequelæ.

During the present outbreak abroad the salts of quinine and aspirin have been most generally used during the acute attack, the latter apparently with much success in the relief of symptoms.

Methods for the control of the disease may be summarized as follows:

Infectious agent.—The *Bacillus influenzae* of Pfeiffer.

Sources of infection.—The secretions from the nose, throat, and respiratory passages of cases or of carriers.

Incubation period.—Three or four days. Average, two days.

Mode of transmission.—By direct contact or indirect contact through the use of handkerchiefs, common towels, cups, mess gear, or other objects contaminated with fresh secretions. Droplet infection plays an important part.

Period of communicability.—As long as the person harbors the causative organism in the respiratory tract.

Methods of control.—(A) The infected individual and his environment.

Recognition of the disease.—By clinical manifestations and bacteriological findings.

Isolation.—Bed isolation of infected individuals during the course of the disease. Screens between beds are to be recommended.

Immunization.—Vaccines are used with only partial success.

Quarantine.—None; impracticable.

Concurrent disinfection.—The discharges from the mouth, throat, nose, and other respiratory passages.

Terminal disinfection.—Thorough cleansing, airing, and sunning. The causative organism is short lived outside of the host.

(B) *General measures.*—The attendant on the case should wear a gauze mask. During epidemics persons should avoid crowded assemblages, street cars, and the like. Education as regards the danger of promiscuous coughing and spitting. Patients, because of the tendency to the development of broncho-pneumonia, should be treated in well-ventilated, warm rooms.