Thesis

Influenza

Its Clinical History, Pathology and Treatment

With cases specially illustrating the connection of this disease with pneumonia.

By A. J. Wheatley M.B. C.M.
Influenza.

Though by no means a new disease to this country; it is only during the last seven years that special attention has been directed to its process. And as a result of these recent observations, we can claim to have made rapid progress with regard to the true nature of the disease, both from a Clinical and a Pathological point of view.

I am not aware that there is any exhaustive textbook on the subject, and what information we possess with regard to its process has been derived, for the most part, from the experience and investigations of many members of the profession recorded in the Medical Papers from time to time during the recent epidemics.

I purpose here, to give a general outline of the disease, with regard to its Clinical history, Pathology and Treatment.

I also wish to direct special attention (with a few illustrative cases) to
that form of Compensated Pneumonia which occasionally accompanies or follows an attack of Influenza, and which I think might be classed, from a Clinical aspect, as a distinct type.

Clinical History.—

The symptoms generally met with are briefly as follows.—

The Stage of Incubation is comparatively short, lasting from a few hours to about two days.

Invasion sets in suddenly with a

Rigor accompanied by frontal headache,

pain at the back of the eyes, muscular pains in the back, loins, and thighs, and a bruised feeling over the whole body. The temperature ranges from 100°F to 104°F, according to the severity of the attack, in some cases it may reach 105°F or even 106°F.

With this rise of temperature we have the usual febrile accompaniments such as—quick pulse, furrowed tongue and thirst, with scanty secretion of
high-coloured urine which may or may not contain traces of albumen.

The patient presents a flushed appearance, or there may be even a distinct rash over the whole body. There is usually more or less congestion of the mucous membranes of the eyes, throat, soft palate. Cardiac dyspnoea is invariably present, as also a dry hacking cough, almost asthmatic in character with scanty expectoration of characteristic yellow bready glairy mucous. On physical examination of the lungs sibilant rhonchi are invariably present.

Types:—

With regard to the varieties of influenza three main types are generally recognised, but there is no well-defined line of demarcation between them, for not infrequently one may meet with a case in which one variety merges into another, or we may have a combination of two types.
(a) That in which the Respiratory System is chiefly involved. Under this type (the one most frequently met with) is classified that Catarhal form of the disease which has been so prevalent during many of the recent epidemics.
(b) That in which the gastric symptoms are most evident. Here we have pain specially referred to the epigastrium with violent retching, and vomiting of small quantities of yellow viscid mucus. Not unfrequently the retching continues for two or three days, in spite of the administration of gastric sedatives.
(c) That in which pains and nervous symptoms predominate over all others. It is in this class that we have that peculiar feature of the disease exhibited to such a marked degree. I mean that prostration, both physically and mentally, which is so prone to treatment, even when continued for a length of time.
Course—

I think that I am justified in stating that no other disease presents so many variations in its course, and in which the complications and sequelae are so varied and numerous.

This feature of the disease has been well demonstrated during the recent epidemics. Whereas, on the one hand we have had a number of uncomplicated cases in which the febrile symptoms subsided in two or three days, the patient making a speedy recovery; at another time there has been quite an epidemic of cases with serious complications or secondary phenomena, in which convalescence has been delayed for weeks or even months, with not unfrequently a fatal termination.

Then again, after recovery or apparent recovery from the primary attack (about eight or ten weeks), there has been a return of the disease, in the form of obscure nervous affections, so frequently associated with this morbid process,
The frequent occurrence of these "Secondary Sequelae", as they might well be named, seems to confirm the view now generally entertained that the poisonous and irritant effect of the influenza poison is mainly exerted upon the nervous system, at its centres, and (in the form of quasi-neurotic affections) upon the peripheral system of nerves.

Propagation -

Previous to the recent epidemics the mode of propagation of the influenza poison was generally accepted to be by aerial dissemination, evidently the rapidity of its diffusion had put the theory of Contagion out of the question. But recent and more minute observations have confirmed the theory of Contagion or Infection, which is now I might say universally accepted. Many observers have endeavored to obtain facts in an outbreak in isolated parts, where there has been no possible chance of communication from outside.
in support of the old theory of aerial dissemination, but without success. From Dr. Parsons' report to the Local Government Board 1893 we see that every effort was made to discover instances of outbreaks occurring on ships at sea, among lighthouse and lightship keepers. Who, having had no communication with the land, had become infected through the atmosphere, but without success.

Again quoting from Dr. Parsons' report, he says, "we cannot but attach weight to the fact that the epidemic was independent of season and weather, that it spread contrary to the prevailing winds, and that it was never known to travel faster than men can travel, that it never occurred among persons so placed as to preclude communication by human agency, that as a rule, it appeared first in each country in the ports of entry or in the frontier towns, and in the busy capitals which were most actively in intercourse with—"
neighbouring lands which were already affected; that, as a rule, the country places remained longer free than the busy towns, even though they might be nearer the countries already invaded by the disease; that the individual members of communities who were most in contact with others were first affected and from them it spread to others with whom they were associated; that persons who were wont to congregate in crowded, and especially in ill-ventilated buildings were specially involved; and that where people were closely associated as in public institutions, the disease came more speedily to its height and was sooner got over than when men were more secluded from one another.

All the above facts prove conclusively that its mode of propagation is by contagion, direct from person to person; and to a lesser degree also by fomites as has been recorded on a few occasions.
Immunity -

From recent literature on the subject, there appears to be a diversity of opinion with regard to the question of immunity. But speaking generally, I may assert that one attack does not ensure immunity from another. There are cases where patients having suffered once from the disease have had no return during the succeeding epidemics. But again many individuals are quite susceptible, having a fresh outbreak during each succeeding epidemic.

Young children certainly appear to enjoy immunity, or is that in them the disease occurs in a modified form, in which its salient features are absent, and thus we fail to recognize it. Speaking from my own experience, during the recent epidemics, very few children have come under my care suffering from influenza, and moreover from the number of cases published the percentage of children affected is very small.
Pathology:

Little was known of the true pathology of influenza until the last few years when, during the recent epidemics, special attention was directed to its etiology. As a result of these investigations its exact cause may now be considered to be well ascertained, due in most part to the researches of Pfeiffer and Kutsato, confirmed by those of Dr. Klein.*

The bacilli of influenza are described as minute and non-mobile, as occurring only during the acute stages and gradually diminishing in numbers as the disease abates; as measuring according to Klein*, in thickness 0.4 μ, and in length 0.8 μ; as staining with some difficulty in aniline dyes requiring a prolonged application of the dye.

In stained specimens these bacilli have a characteristic appearance, inasmuch as their protoplasm is segregated into a stained granule at each end, while the middle portion remains unstained.

* Report on Epidemic Influenza to the Local Government Board 1893.
In the sputum these bacilli occur in smaller and larger masses, occasionally almost as pure culture. In severe cases they form continuous masses in the peri-bronchial tissue, and also in the sub-pulmonary lymphatics, and they are also met with inside the leukocytes of the sputum. They are constantly present in influenza, but do not occur in the bronchial secretion of other bronchial or pulmonary affections. Dr. Klein states that these bacilli are only found occasionally in the blood, and then only in small quantities, and as dead or dying bacilli.

According to Sir J. Strangjer Stewart the bacillus cannot grow above 42°C = 107°F nor at the utmost below 23°C = 73.4°F or 24°C = 75.2°F. And he goes on to say that "as in temperate climates such a temperature is not often reached, and is certainly never maintained for any length of time, and as the disease spreads in cold weather as well as warm, it is clear that it cannot multiply outside the human body."

* Report on Epidemic Influenza to the Local Government, 1893.
+ British Medical Journal, August 4th, 1894.
Recent observations certainly appear to support this theory, for it has been during the winter months and not the summer, that the outbreaks have occurred, the most favourable time of the year being between November and May.

From May to September we have been practically free from the disease, except for a few scattered cases here and there.

It is also quite evident that moisture in some way or other increases the vitality of the organism. For generally during dry frosty weather there has been very little influenza about, but as soon as a thaw set in we had an outbreak of the disease - I noticed this especially during the long frost of 1875, when we were quite free from it, but after the thaw set in we had a fresh outbreak.

In what way does moisture influence the action of the bacillus? I should say probably by lowering the power of resistance, by the development of respiratory affections, so frequently met with in cold wet weather.
and thus the bacilli find a medium for its growth and development. With regard to the mode of action of the bacilli, there is no doubt that the varied & peculiar auscultatory sounds heard in the early stages, are due to the direct impact upon the mucous surface of the specific germs of the disease, and that on each of these spots some of the influenza seed has alighted and has there grown and fructified, causing by this growth the irritation which produces the mucous secretion and consequent sounds. It may be presumed that the same local effects are produced upon the gastric and intestinal mucous surfaces when these parts are more especially affected. But it is to its indirect action, by the production of phlegmasia, that the greater proportion of the symptoms and features of the disease are attributed. And the following facts appear to support this view:—

(a) That the bacilli are only in great
numbers during the acute stages rapidly diminishing, as the disease advances.

6. That they are not present in the blood, in the active state, only as dead or dying bacilli.

7. That the bacilli are rarely met with in other tissues outside the Respiratory Tract.

Accordingly there appears to be no other method (except by the phrenological theory) of explaining the "sequelae" so frequently associated with this disease, long after the initial attack has passed off.

In this way only can one explain the Cardiac dyspnoea, the abiding weakness, the neuritic pains, or local Neuralgias and various other neuroses, the Mental disorders and other nervous phenomena so frequently met with as results of the influenza process.

I have not attempted here to give a full classification of the sequelae, because of my inability to give anything like a complete list from my own personal observations.
Notes on a few illustrative cases with Pneumonia as a complication.

Case I. Influenza, Pneumonia, Rapid Recovery, with no Sequelae.

Mrs. B., Age 17, first seen February 27th, 1896.

Two days previous to my first visit, patient had complained of frontal headache, pain in the back and a feeling of dryness in the throat. She presented a flushed appearance, and there was a distinct rash somewhat scarlatinoid in character over the whole body. The mucous membranes of the throat and soft palate were intensely congested. Temperature 104°F., marked dyspnoea, and a dry hacking cough with scanty expectoration of yellow viscid sputum. On examination the lungs were found to be normal except for a harsh vesicular breathing over the left base.

On February 28th-

Pain specially referred to the left side.

Temperature 106°F. (Antipyrine 0.511 given).
**Disease:**

Influenza

**Notes of Case:**

Name: Miss A.

Age: 15 years

**Initial Fluid:** Case Book No. 1

**Temperature:**

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**Normal Temperature of Body:** 98°

**Day of Dis.**

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**First Visit:** Date of Admission: February 27th, 1896

**Result Recovery:**

Entered at Stationer's Hall.

Printed and Published by Wodderspoon & Co., 7, Serle Street, Lincoln's Inn.

Gould's Clinical Chart.
Cough and expectoration much the same amount somewhat increased.

On examination, the percussion note over the left base is slightly impaired; the breath sounds broncho-vascular in character, with prolonged expiration accompanied by fine crepitations. Vocal resonance slightly decreased.

February 29th:

Crisis has taken place. Temperature 99.7

A few days after the lung was quiet clear, and the patient made an uninterrupted recovery with no sequelae.

Remarks:

Here we have an illustration of an acute pneumonia with imperfect consolidation. The chart presents no remarkable feature, except it be the accompanying constipation.

Case II. Influenza. Double Pneumonia Slow Recovery, with prolonged Nervous Illness.

Miss B. Oct 20. First seen March 22d, 1896.

On the previous day, patient was suddenly seized with a rigor accompanied by violent
Retching and pain specially referred to the epigastrium, in addition to the usual characteristic symptoms. Temperature 104°F. As in the preceding case dyspnoea was a marked feature.

As a result of the continual retching small quantities of yellow or red mucus were vomited, from time to time throughout the first three days of the disease, this mucus resembled in character the true influenza sputum.

On examining the chest rale and bronchi were present.

March 3rd

Patient's condition much the same. The retching still continued in spite of gastric sedatives administered. The cough is more evident than on the preceding day. Temperature 105°F.

On examination of the chest there is dullness over the left base, and bronchovascular breathing with prolonged expiration, accompanied by fine crepitations.

March 4th

The gastric symptoms, although still
DISEASE.
Influenza.
Double Pneumonia.
Notes of Case.

Name: Mrs. B.
Age: 20 years.
Sex: Female.
Fluid: Urine.

Case Book No. 3 in Thesis.

Temperature (Fahrenheit):

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Normal Temperature of Body: 98°

Day of Dis. | Pulse | Resp. | Date
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5            | 114   | 85    | 5
6            | 114   | 85    | 6
7            | 114   | 85    | 7
8            | 114   | 85    | 8
9            | 114   | 85    | 9
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12           | 114   | 85    | 12
13           | 114   | 85    | 13
14           | 114   | 85    | 14
15           | 114   | 85    | 15
16           | 114   | 85    | 16
17           | 114   | 85    | 17
18           | 114   | 85    | 18

Entered at Stationer's Hall.
Printed and Published by Wodderspoon & Co., 7 Serle Street, Lincoln's Inn.
Gould's Clinical Chart.
Present are not so severe. There is an increased area of dullness on the left side, with bronchial breathing. There is also evidence of a commencing pneumonia on the right side.

March 5th.

The febrile symptoms have abated, but there is increased dyspnoea probably due to the fact that both lower lobes are solidified with pneumonia. Patient is also somewhat delirious.

March 6th.

There is little alteration in patient's condition. Pulse quick and febrile. Temperature 103°F.

March 7th.

Temperature 97.5°F. Crisis has taken place, on the seventh day from the first commencement of the symptoms. The consolidated lung tissue cleared up somewhat rapidly, but her recovery was delayed for weeks by the prolonged nervous debility so frequently associated with influenza.
Remarks.

The temperature in the early stages is not shown in the accompanying chart, however up to the day preceding the crisis it ranged between 102°F and 103°F.

In this case we have an illustration of combination of types; in which both the Pulmonary and Gastric syndrome are involved. The special features to be noted in this case were the obstinate Constipation, and gastric irritation. The low range of the temperature during convalescence which lasted for many weeks.

Case III. Influenza. Double Pneumonia. Slow Recovery with prolonged nervous debility.

Mrs. B. Aged 40. First seen March 2nd 1896.

(Mother of the preceding patient, living in the same house).

It is unnecessary to describe this case in detail, as it was similar in almost every feature to the preceding one. The first symptoms were noticed from 12 to 24 hours after
Influenza a

Notes of Case.

Age 45 years.


Date of admission. March 2nd 1896.

Result. Recovery.

Entered at Stationers Hall.

Printed and Published by Wooderspoon & Co. 7 Serle Street, Lincoln's Inn.
Her daughter had been seized. The febrile symptoms as in the former case, were specially evident, and continued during the first three days of the disease. The double pneumonitis first developing in the left case and spreading to the right; the abdinal clearness and the subnormal temperature during Convalescence were present in this case as have been described as occurring in Case 10. Almost the only difference the chart presents in this case (now) from that of now is the slight rise of temperature after the Crisis had taken place. This was due to a return of the febrile symptoms, on March 9th, which lasted during the following day. Resolution took place somewhat rapidly, but recovery was delayed for several weeks by the prolonged nervous debility, which so frequently accompanies declining a.

Daisy P. Let 7. First seen March 6th 1896.

On the evening of March 5th patient suddenly complained of pain in the left side, this was the only subjective symptom to be ascertained. The face was very much flushed. Temperature 104°F, with the usual febrile symptoms and characteristic dyspnoea. There was also a slight cough.

On examining the chest, sibilant rhonchi were detected here and there over both lungs. There was a patch of dulness over the left base with harsh vesicular breathing accompanied by fine crepitations.

March 7th:

Patient's condition much the same. Cough more troublesome, the sputum is coughed up with difficulty. There is an increased area of consolidation over the left base.

March 8th:

Pains specially referred to the right side.
Disease.
Influenza.
Double Pneumonia.
Notes of Case.

Name: Daisy P.
Age: 7 years.
Sex: Female.
Height: Fluid.

Book No. IV in the

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Temperature (Fahrenheit):

Day of Disease:
1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th.

Date of Admission:
March 6, 1896.

Result: Recovery.

Entered at Stationers Hall.
There is evidence of a commencing pleurisy of the right base. The cough is more troublesome, and the sputum has attained a somewhat yellowish tint. March 9th.

There is dullness over both lower lobes. The dyspnoea is increased and the child is delirious especially towards evening. Paris complained of in the arms and legs. March 10th.

During these three days the child remained in the same condition; generally somewhat worse towards night. March 13th.

Crisis had taken place, the consolidated portions rapidly absorbing. The patient making a speedy recovery with no sequelae.

Remarks.

The most notable feature in this case was the absence of subjective symptoms during the early stages of the disease.
From a close observation of the foregoing cases I can say that the course and symptoms of the lung affection differ most materially from those of an ordinary pneumonia. Thus the solidification of the lung tissue is never very dense, and the percussion note is never very dull, and rarely do you get the true tubular breathing with bronchophony so frequently dealt with in the ordinary pneumonia. Whilst the clearing up of the engorged and consolidated lung tissue has often been unexpectedly rapid. The fact that these cases all occurred in a localized area, directly after one another, appears to support the theory of the infective character of this pneumonia. Though influenza and epidemic pneumonia are closely related to one another yet they are not identical, seeing that some of the specialized symptoms distinctive of the former are always wanting in the latter.
Now with regard to our general Knowledge of Influenza, up to the present time, I might here sum up briefly, the principal features of the disease that present themselves to my mind.

1. It is a specific fever with definite symptoms and secondary nervous phenomena, and should be classified along with the exanthemata.

2. It is caused by a specific bacillus which produces its effects in a certain extent directly, and also indirectly by the production of poisons.

3. The bacillus is always to be found in the Respiratory tract, but rarely in any other tissue or organ of the body.

4. It appears to live and thrive best in the colder temperatures and especially so when moisture exists in the atmosphere.

5. It has a comparatively short period of incubation lasting from a few hours to two days.

6. The disease is communicable direct from the sick to the sound, by this
means it is usually spread, and also to a lesser extent by fomites.
(7) Numerous complications are associated with it. Almost any tissue or organ of the body may be affected.
(8) The disease is apt to be followed long after the initial attack has passed off, by various sequelae, (apparently the result of central or peripheral changes in the nervous system) and especially by asthenia.
(9) These secondary phenomena are probably caused by the poisonous influence of the poison secreted by the bacillus, and perhaps also to a certain extent to the presence of the dead organisms in the blood.
(10) In uncomplicated cases, influenza frequently runs its course in two or three days, without any serious after effects. But in complicated cases a serious termination is often to be looked for and especially when the patient is advanced in years and somewhat feeble.
Treatment.

The disease being a specific fever, and being caused by a specific organism, we have, as yet, no means of killing this germ and thus cutting short an attack.

Under these circumstances we must endeavour to support the patient's strength by the administration of nourishing and easily digested food; and especially is it necessary to be careful with regard to diet when we have that fatique form of the disease to deal with.

Drugs do not appear to produce any decided influence upon the disease. Still in the early stages when there is much fever such drugs as Quinine and Salicylate of Soda are useful.

When the pulmonary symptoms are distressing, relief is often got by the administration of stimulant expectorants such as Carbonate of Ammonia &c.

In the later stages of the disease where we have nervous debility developed
Quinine is the drug from which most benefit has been derived. It may be prescribed alone, but sometimes more benefit is derived by its combination with iron and strychnine.

Various special or specific drugs have, from time to time, been recommended for this disease, but none of them have stood the test of experience.

Thus at present our only means of combating the disease, is by stimulant and supporting treatment.