The Influenza Pandemic of 1918-1919.

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Introduction:— In practically every medical journal during the last year, a great amount of attention has been paid to a great Pandemic which overran this country in the Winter of 1918-19, and which at present is holding the Antipodes in its grip.

At first the Pandemic was not recognised as Influenza, but was called by various names e.g. "The New Disease," "The Spanish Sickness"—the latter name arising from the fact that Spain was the first European country in which the disease appeared as an epidemic. The hesitation in calling the epidemic Influenza, can be explained readily, as most of the present generation of
Medical Practitioners did not have the experience of the 1890 Pandemic, and also the condition was confused—by men serving with the Forces—with diseases such as Dengue, Trench Fever, and other febrile conditions, common among the overseas troops. Another reason for the nondiagnosis of Influenza, might be that younger medical men are prone to use "Influenza" as their sheet-anchor in the diagnosis of many obscure febrile conditions. The nature of the disease, however, gradually became manifest and now it is generally accepted, that the disease is really Influenza i.e. a disease having the characteristics and clinical features of similar type to the last Pandemic, and of which sporadic cases occur every year.

The whole subject is of very great importance, inasmuch as the Pandemic has been accompanied by an exceedingly high rate of
incidence and mortality. Such being the case, no apology is necessary for choosing this condition as a subject for my M.D. Thesis, in which an attempt is made to set forth the more salient points of the disease based upon my own experience.

**Historical Outline:** — Influenza is a disease of great antiquity, and if some authors are to be believed, the epidemics described by Hippocrates and Livy in 412 B.C., and by Gregory in 591 A.D., were really Influenza. In 1573, a disease presenting some of the features of Influenza, as we now know it, overran Europe, and in 1510, a disease, similar to the present epidemic, is described as having been very prevalent in the continent of Europe, but not in Britain. Although several epidemics occurred in the sixteenth century, we find no real account of Influenza till 1580, when it overran both Asia and Europe and proved very fatal. During the
seventeenth and eighteenth centuries, epidemics broke out at varying intervals but were not world-spread. In 1830 an intense Influenzal outbreak occurred, which spread over the whole world, but from this date till 1890 only two epidemics occurred.

The Pandemic of 1890 was the most important of all the outbreaks, and since then there have always been cases of Influenza in this country, and occasionally local epidemics have occurred. There were several minor epidemics in 1916, 1916, 1917, and from 1918-19 a severe Pandemic has been raging, and although it has died out somewhat in this country, yet it is still greatly in evidence in other parts of the world.

War conditions are no doubt responsible for the intensity of the Pandemic in Britain and other belligerent countries. In this latest Pandemic, Spain was the first country
in which the disease appeared as an epidemic, and it gradually spread to France and then to Great Britain. Germany, America, South Africa, India, and Australia have in turn been affected. In this country the disease first appeared in the southern counties of England and quickly extended, till even the North Isles were involved.

A very interesting point to note is, that until 1890, there have been fairly long periods in which no outbreaks of Influenza occurred.

The mortality from Influenza increases as Winter approaches. In London, for example, in the 38th week of 1918 there were only nine deaths from Influenza, while in the 43rd week of 1918, there were two thousand four hundred and fifty-eight fatal cases.
Etiology & Pathology:—The term “Influenza” is based upon a false hypothesis; it is quite unscientific and holds no recognised position in medical nomenclature. The word was first used by the Italians in the sixteenth century, who put the cause for the effect—the word meaning “the influence of cold” or “influence through atmospheric phenomena.” Pringle and Ruscham in this country were the first to use the term in connection with the epidemic of 1743. Other names such as “Grippe” and “Catarrhal Fever” have been given to the disease, and older writers describe it under various terms, which indicate great ingenuity on the part of those responsible. It may be stated here that atmospheric and tilluric conditions have apparently nothing to do with the pandemic spread of the disease, although season does seem to have some influence on
the origin of primary outbreaks and of after-epidemics, most of the epidemics occurring in the Winter and Spring. “Et tempore frigidiore et calidiori, et plante tam Austra quam Borosa, et pluvioso et sereno coelo, peragravit, hasee omnes Europae regiones, et omnia loca indiscriminatim” (Hancock 1783).

All ages are liable to be affected, but it is of interest to note, that infants suckled at the breast seldom contract the disease. I have seen one case, where a woman suckled her child who did not contract the disease, although the woman herself suffered for about five days. The greatest incidence occurs between twenty and forty years of age. As regards sex, the general condition is, that males are more often affected. This is probably due to the greater intercommunication between males. Occupational incidence may similarly be explained.
It is probably the case, that Influenza is endemic in China, where until 1890, it was generally diagnosed as Dengue, and certainly the tendency of spread being from East to West might confirm this view. Among the Russians the disease is known as the "Chinese Influenza." Dr. Bantle of Hong Kong definitely states that the disease is endemic in China, and that when the Pandemic, spreading from East to West, reaches Japan, it crosses over again to China where fresh outbreaks then occur.

Influenza is infectious and therefore a germ disease; but until 1892 when Pfeiffer first published an account of the Bacillus Influenzæ, many theories were held as to the cause of the disease; most writers holding that it was due to some condition of the atmosphere.

At one time it was thought that an epizootic preceded
the epidemic of Influenza, but there is no direct evidence, that man
contracts the disease from animals.

Col. G.R. Murray in "The Lancet" of January 15th 1919, describes a condition in horses, which closely resembles the disease in man, and an organism which appeared to be identical with Pfeiffer's Bacterium Influenzae was isolated from the bronchial secretions of the affected animals.

Great stress is laid by some writers on the rapidity of spread of the Pandemic, but the spread is not so rapid as it would seem at first sight; because there are nearly always to be found a few scattered cases of Influenza before the epidemic is really recognised. Certainly the rapid spread of the disease is not inconsistent with the rapidity of modern travel, and it may here be said, that the mode of spread is by means of infected droplets of sputum or bronchial secretion.

In 1892 Pfeiffer published,
in the "Deutsche Medicinische Wochenschrift," an account of a bacillus isolated from the purulent bronchial secretions of persons suffering from Influenza, which he stated to be the causal organism of the disease. His statement was based upon the accurate examinations of thirty-one cases of Influenza. He found that in uncomplicated cases of the disease, the organism was present in pure culture, frequently situated in the protoplasm of pus corpuscles. The presence of this Bacillus Influenzae kept pace with the course of the disease, and as the cessation of purulent bronchial secretion occurred, the organisms diminished in number. Inoculation experiments carried out by Pfeiffer showed that among animals only apes, and to a less degree rabbits, were susceptible. Kitasato and Canon, also in Berlin, confirmed Pfeiffer's results. The Bacillus Influenzae is usually found associated with
other organisms of which the most important are various Staphylococci, Pneumococci, Micrococcus catarrhalis, Staphylococcus Pyogenes, and the so-called "Pseudo-Influenzae" bacilli. Much controversy has taken place as to the actual causal organism of Influenza. In a report to Sir John R. Bradford, Director-General Medical Services France, an organism was described which had been isolated from cases of Influenza. This organism was a filter-passing, coccus-like, 15 μ X 8 μ, and stained by Gram's method. The organism was anaerobic and resisted heating at 56°C for half-an-hour. It was obtained from the sputum, pleural fluid, and lymphatic glands. Inoculation into animals of the infected exudates produced similar conditions to those found in the cases of Influenza, from which the virus was isolated. Sir John Bradford considers this filter-passing as the cause of Influenza.
Whether Pfeiffer's Bacillus is the cause of Influenza is summed up by Muir and Ritchie in their Manual of Bacteriology thus:—"The evidence, accordingly, that the Influenza Bacillus is the cause of the disease, rests chiefly in the well-established fact that it is always present in the secretions of the respiratory tract in true cases of Influenza, and often in very large numbers. The observed relationships of the organisms to lesions in the lungs and elsewhere leave no room for doubt that it is possessed of pathogenic properties, but we cannot yet maintain that its causal relationship to epidemic Influenza is absolutely established."

In the Lancet of August 9th 1919 Dr. Beaumont describes a mycotic organism isolated from Influenza patients, and puts forth the theory, that "Influenza might be a mycosis - not necessarily a Bronchomycosis, but perhaps in some
cases an Enteromycosis." More work must be done on the Streptothrix group of organisms, before this group can be excluded from the organisms which may possibly cause Influenza. Pathologists seem to agree that the disease is "primarily a bacteriæmia localised in particular in the pulmonary blood-vessels. Haemorrhages in the lungs pave the way for secondary infections." As the Baillus Influenzae is in the majority of cases not found in the blood in the early stages of the disease, it cannot be the originator of the lesions found, even although this organism is always present in cases of Influenza. Some bacteriologists say that the lesions are caused by the symbiosis of the Baillus Influenzae with other pathogenic organisms, and, considering the multitude of organisms isolated, this is probably the case. Others say that the virus is a filter-passers, which paves the way
for the Bacillus Influenzae, and that the other pathogens are secondary. In simple non-fatal cases of Influenza, the condition seems to be a slight toxæmia with a mild congestion of fauces and respiratory tract, and also nasal catarrh.

In fatal cases, death is usually due to septiæmia, and the greatest number of lesions is found in the respiratory tract. In the lungs, post-mortem, are found scattered areas of Broncho-pneumonia and very rarely is there any definite consolidation, as seen in lobarous Pneumonia. The bronchial tubes are covered with a purulent secretion in which the Bacillus Influenzae, Pneumococcus, and various Streptococci abound. Congestion and haemorrhages in the mucous membrane of the respiratory passages are nearly always present at the commencement of the disease. Occasionally there are patches
of pleurisy with purulent effusion, rich in microorganisms.

No definite lesion is to be found in the heart other than a dilatation of the right side. In most cases a blood count shows an increase of lymphocytes and a diminution of polymorphonuclear leucocytes.

The kidney may show a glomerular nephritis, while the liver and spleen are slightly enlarged and congested. The thyroid gland is nearly always enlarged.

The alimentary tract shows no change except in the gastrointestinal type, in which congestion occasionally occurs.

Meningitis is a very rare complication.

**Clinical Features** — The clinical features portrayed by influenza are many and varied. Any system may be affected. Probably a better definition
of Influenza cannot be got than that of Sir John Moore, given in the
Encyclopaedia Medica in 1901:—
"Influenza is an acute, specific, infective febrile affection, characterised
by its remarkably sudden onset, after
an incubation of about two or three
days, the many symptomatic phases it presents, the singular predisposition
to other secondary infections which it induces, its disastrous effect
upon the heart, and the prolonged convalescence which follows in its wake."
Various attempts have been made at the classification of
Influenza, and those are generally
based on the particular systems
which are most severely affected.
Probably the best classification is
that into two types, (a) "The Toxic"
(b) "The Toxic-inflammatory." This
classification will serve in describing
the clinical features, although many other
types have been described, such as, Influenzal
throat, Influenzal cold, and Typhoid Influenza.
Some symptoms are common to all types—a sudden onset with intense headache generally frontal and orbital. In addition, there are severe aches and pains all over the body, most marked in the limbs. Constipation is a common feature except in the intestinal types. The breath is offensive, and the tongue is moist and covered with a thick creamy fur. The fever is very variable, but, as a rule, there is an abrupt rise of temperature to 102°F or 104°F. Rigors are not uncommon. The pulse rate is accelerated, but not in proportion to the rise of temperature. Profuse sweating is seldom absent, while there is usually a dry hard cough with coryzal symptoms. A point worthy of note is the marked debility and helplessness of the patient.

In the toxic type of influenza, the patient usually gives a history of suddenly feeling unwell.
and out of sorts. He aches all over. His head throbs painfully. His face is flushed and of a bright red colour. The eyes are bloodshot and painful, while photophobia is frequently present. The temperature is about 103°F and the pulse about 80 p.m. The throat smarting thirst is complained of, and profuse nasal catarrh is present. Vomiting is an occasional symptom. Sometimes the attack commences with a feeling of chilliness and the patient complains that he cannot get warmed. Later he bursts into a profuse perspiration, feels somewhat more comfortable, but aches and pains are still present. The temperature varies, but seldom is below 105°F, till the third day of the illness, when it may be only 99°F. On the fifth day, occasionally on the fourth, the temperature is subnormal, and remains so for three or four days. This subnormal temperature is an outstanding
feature of Influenza. It is very important that during this period of low temperature, the patient should be kept quiet and warm, as the aches and pains having disappeared, he is inclined to consider himself well. Most of the deaths from cardiac failure occur during this period, although, with quiet and warmth, there should be no fatal issue to a case of simple toxic Influenza.

The toxic-inflammatory type of Influenza is usually an affection of the heart and lungs, or it may be gastrointestinal.

The onset of the attack may be similar to that of the toxic type, gradually assuming a pneumonic condition. The cough becomes harsh, and there is abundant expectoration of purulent secretion, tinged with blood from haemorrhages in the bronchial mucous membrane. The temperature is about 104°F and the pulse rate over 120 per min. The patient complains of pain in his
chest, when he coughs. On percussion, one can sometimes find small patches of dulness, although not rarely this is absent. Auscultation reveals scattered areas of capillary bronchitis, or of broncho-pneumonia. Frequently, the broncho-pneumonic patch clears up, the temperature falls to normal, and the patient looks as if he were over the worst of the disease, when another area of bronchopneumonia starts. This may happen several times, and although recovery frequently occurs, yet the highest mortality is found in this type. It is an interesting point to note that when the patient's face shows a "heliotrope" cyanosis, it is quite certain that the patient will not recover. This is the case, even when the patient feels comfortable, and when there is no other indication of a fatal issue.

Influenza seldom causes endocarditis. Cardiac murmurs are common.
but they are usually due to dilatation of the heart. There is great feebleness of the heart muscle and frequently precordial distress is evident.

In the Gastrointestinal cases, the patient has no appetite, constipation is the case at first but later there is a profuse watery diarrhoea. It may be mentioned here that when calomel is administered to an Influenzal patient, it often causes the disease to take on the gastrointestinal type. Nausea and vomiting are common. The abdomen is tender and often distended. Motions are frequent. Except in rare cases this type recovers in a few days.

I know of one instance in which a laparotomy was performed on an influenzal patient, his symptoms pointing to an acute abdominal condition. At the operation no lesion was found in the abdomen.
The nervous phenomena, that frequently occur in cases of Influenza, would furnish sufficient material for a thesis by themselves. It is sufficient to say here, that the nervous manifestations appear generally towards the end of the disease, and that during the acute stage the nervous condition is mainly maniacal, whereas during convalescence it is nearly always neurasthenic.

Age somewhat affects the type of disease. In children the type is mainly a simple feverish condition, while in old people the rheumatic type is more prevalent. In young adults any type of the disease may be found. With regard to sex it may be said that the nervous phenomena are more common in females than in males.

The above account of the clinical features of Influenza, is based on personal experience of cases under my care.
TREATMENT: — So far no known drug has been found to be specific in Influenza, and from the remarks on the Bacteriology of the disease, it is easily seen that vaccine treatment cannot prove to be very successful. Immunity such as is seen after Smallpox is not obtainable, but there is no doubt, that there is a very short period of immunity after the disease. The ease with which many patients are attacked year after year, suggests that one attack rather predisposes to another.

Prophylaxis theoretically is quite possible, but practically is very difficult to carry out. Newsholme points out that the failure of prophylactic measures may be attributed to the following causes:—
(a) The period of incubation is short.
(b) The disease is infectious in its earliest stage before its nature is recognised.
(c) The milder forms of the disease in which the patient is not disabled.
from work, are just as infectious as the severe forms.

(a) The diagnosis of Influenza is often difficult. If at the beginning of an outbreak a person were to retire to some secluded spot, and cut himself off from communication with busy centres, he might possibly escape; but in an intense pandemic it is doubtful if even this strict isolation would protect him. It is possible, however, that isolation will prevent infection eg. in the case of lighthouses. Influenza is more liable to attack the weak and debilitated, and probably the best prophylaxis is to keep in good health by living hygienically and husbanding one's strength. Plenty of fresh air and nourishing food are therefore the best prophylactic agents. Sir William Broadbent and other authorities believe in Quinine as a prophylactic, but even this is doubtful. As the chief source of infection is the
upper respiratory passages, many people have resorted to antiseptic sprays, gurgles, and inhalations as a means of prophylaxis, but the irritation of the mucous membrane by such antiseptics, results in congestion, which in all probability only makes easier the multiplication and development of the microorganisms. Oil of eucalyptus, kerosine, camphor, and a host of proprietary antiseptics have all been tried, but with little benefit if any.

Vaccines and antiserum so far have proved useless in prophylaxis. For the treatment of an actual case of influenza, some definite rules can be laid down, viz.: (a) Rest in bed. (b) Warmth. (c) Quiet. (d) Proper ventilation. This last is the only difficult part of the general treatment. Patients are apt to sacrifice the ventilation in the effort to keep warm. As a rule an influenzal
patient is only too glad to rest in bed and keep warm and quiet.

Besides these general rules treatment is either (1) symptomatic or specific treatment, the former being that most relied upon.

Symptomatic Treatment:—In an ordinary uncomplicated case of influenza many drugs have been used, among which the commonest are Quinine, Phenacetin, Antipyrine, Aspirin, and Salicylate of Soda. Personally I have found the following to be of the most service:—R. Phenalgin grvi

Sodae Salicylate grvi

71. Cachet.

Dip. one every four hours till the aches are relieved.

This should be followed up by the following:—R. Z. Ferri Perchlor. mx.

Dip. Ammon Acet. 3s.

Dip. three daily.

Each case of Influenza should to begin with, receive an aperient
preference a saline, e.g. Mag. Sulph. Calomel is seldom borne well. Whatever treatment is carried out, no medicine should be given in order to bring down the temperature. It is much the wiser plan to give drugs which will relieve the aches and pains, and make the patient feel comfortable. Lq. Opii Sedativus ζ is one of the best in this respect, and has always been successful when Phenalgin and Soda Salicylate failed. If necessary tepid sponging can be used to reduce the temperature. Every simple case of Influenza will recover if the general principles given above are adhered to—without drugs.

The complications of Influenza are many, and treatment must be varied to suit individual cases. For cardiac weakness the best thing to do, is to give stimulants in the form of Ammonia and Strychnine. It is much wiser not to
give alcohol in any form. Alcohol only increases the headache, if given during the acute stage. Another objection to alcohol is that just as neurotics incline to make a habit of taking sedatives, so do influenza patients with alcohol. Where cough is troublesome, and there are no pneumonia signs, a teaspoonful of belladonna veratrum will usually meet the case. Insomnia is seldom a complication, and I do not think that active hypnotics are ever needed. Thirty grains of acetyl-salicylic acid will usually help the patient to a good night's sleep.

In bronchopneumonic complications, nothing in the way of treatment has proved of value. The main thing is to make the patient feel comfortable, keep his strength up, and give stimulant expectorants to aid the escape of purulent bronchial secretion.
Later a cough mixture such as the following will prove useful:

A Dr. Camph Co.

Naphtha Chloric.

Oxygels Sulph. 2a x 31.

Sig. Every four hours.

For the neuralgic pains
the salicylate group of drugs is
the most effective.

For the sore throat, a
paint of Tannin with Glycerin
Acid Carbolic is most effective.

In gastro-intestinal cases
the best treatment is to give a
saline aperient, and then keep
the patient on a milk and water
diet for a few days. Intestinal
antiseptics have not proved to be
of any use.

The diet in all cases of
Influenza should be nourishing
and easily digested. At first milk,
and egg albumen water are all that
is required. Later give egg-flip, broths
and gradually make the diet more
solid, till chicken, fish, and finally roast joints may be allowed.

Unless some special symptom calls for alcohol it should be withheld.

Specific Treatment: — In simple cases of influenza vaccine and antiserum treatment are usually for. Many polyvalent vaccines are on the market for the treatment, especially of influenza broncho-pneumonia. Most physicians are frankly sceptical as to the efficiency of such preparations. Indeed, until the actual causal organism or organisms of influenza are discovered, one cannot pin one's faith on sera- or vaccine-therapy.

The period of convalescence after influenza, is almost as difficult and as important to treat properly as the acute stage. Post-influenzal debility is very common and for months the patient may not regain his strength. An important sequel to influenza is the abnormal nervous
condition of the convalescent. Neurotic and neurasthenic conditions are very common, and judging from the number of verdicts returned by coroner's inquests, on cases of suicide, one is forced to believe that Influenza has a most disturbing effect upon the mental equilibrium of its victims.

Rest, change of air and scene, healthy surroundings, and general hygienic living are essential. Time is an important factor and complete recovery cannot be hastened. Food nourishing diet should be enjoined, and tonics such as Glycerophosphates or Hypophosphites, with Strychnine are useful. Every effort should be made to enable a convalescent to build up his system, so as to withstand effectively another attack. I have noticed that those convalescents, who go away for a change, very seldom get relapses.
of Influenza, while those who do not change their environment, are much more liable to relapses.

**Summary:** Influenza is of great antiquity, and improved methods of diagnosis have enabled it to be recognised as such.

**Etiology:** As yet no one organism can be definitely pointed out as the causal organism of Influenza. Atmospheric and telluric conditions have nothing to do with the origin of the disease, although season has some influence in determining primary epidemics and after-epidemics. The present pandemic can be directly traced to war conditions.

**Pathology:** The greater number of lesions are to be found in the respiratory system. Death is usually due to septicemia.

**Clinical Features:** Symptomatology depends upon the system affected.
Any system may be affected, and usually more than one system at a time.

Treatment: No specific treatment has been discovered.

Rest, quiet, warmth, good ventilation and careful dieting are of more use than any drug. Convalescence is often protracted, and requires as much care as the acute stage.