

**THE VISITATIONS OF INFLUENZA AND ITS INFLUENCE
UPON GYNECOLOGIC AND OBSTETRIC CONDITIONS.***

BY

LILIAN K. P. FARRAR, A. B., M. D., F. A. C. S.,

New York, N. Y.

THE uncertain and fragmentary character of the oldest medical chronicles does not permit the absolute identification of influenza with the "Epidemical Diseases" of Hippocrates or with the "Plague of Athens" described by Thucydides, nevertheless, many historians believe them to be one and the same disease.

From the 6th to the 10th century, influenza was probably en-

* Read before the New York Academy of Medicine, Section on Obstetrics and Gynecology, November 26, 1918, and in part before the Section on Historical Medicine November 13, 1918.

demical in Italy, but it is not until the 12th century that the chronicles clearly record the epidemic character. In the year 1173 the records of France, Germany, and Italy mention the presence of a disease, evidently epidemic if one may judge from the ecclesiastical manuscripts which state: "In these days the whole world was infected by a nebulous corruption of the air causing catarrh of the stomach and a general cough, to the detriment of all and the death of many." Under this same year (1173) the chronicler of Melrose Abbey enters: "A certain evil and unheard of cough which affected every one far and near and cut off many." In the medieval Latin chronicles, the word "tussis," or cough, is usually used, the name "influenza" not having been given to the disease until about the 18th century. Prior to this time we find numerous terms, some of them more or less fanciful, to describe the symptoms of the disease; others derived from the name of the country whence it was supposed to have come. In early Gaelic manuscripts a disease is mentioned the symptoms of which answer to those of influenza and which was called "Creatan" probably from "Creat," meaning chest; and in the "Annales of the Four Masters" mention is made of an epidemic of the disease in Ireland in 1328, called "Feucht" or "Slædan."

In France, under Charles the Sixth, in 1414, is an account by Pasquier which leaves no doubt the disease described is influenza, then called "Ladendo." This is the first known description, and allusion was also made to the influence of the disease upon the puerperal state, and the menorrhagia which resulted.

A few years later (1427), a St. Albans chronicler of Canterbury Abbey recorded: "In the beginning of October a certain rheumy infirmity, which is called "Mure" (at this date used to describe universal influenza, later, a cold) invaded the whole people and so infected the aged along with the younger that it conducted a great number to the grave." About this same time (1430) an epidemic occurred in Scotland which was probably influenza but was called "Pestilentia Volatilis."

In 1510 a wave of influenza swept from the south to the North of Europe, from Malta, Sicily, Spain, Portugal, Italy to Germany, Holland, France, and England. It was described under various names, viz., "Catarrhus Epidemica" or "Febris Catarrhalis Epidemica." No name was distinctive, but perhaps the most common was "ague," the term ague meaning simply acute, the adjective of "febris acuta" having been made into a substantive.

The universal description of this fever, its suddenness, simultaneity, universality, prostration, and for some time a violent parox-

ysmal cough, leaves no doubt of the character of the disease in this epidemic. In 1557-1558 occurred the historical great wave of influenza now known as "The Strange Sickness," "The New Sickness," "The New Acquaintance," "Shafhusten," "The Sweating Fever" or "The Posting Sweat," from the rapidity with which it invaded England, or simply as "The Sweat." This latter seems to have been a common name for the sickness in Shakespeare's time, for in "Measure for Measure," the Bard says: "What with the War, what with the sweat, what with the gallows, and what with poverty, I am custom-shrunk. How now? What's the news with you?"

The next undoubted influenza (1580) was pandemic, traveling from the Orient to Constantinople and North Africa, invading Europe, and extending to the British Isles. It was described as an "Epidemic Catarrhus, Semi-pestilential Fever." On the continent it was frequently termed "Sudor Anglicus" or "English Sickness." In Italy it was called the "Cocolucio," meaning cap, from the almost pathognomonic symptoms of distressing pain and sense of constriction in the forehead or temples, reminding one of the "fierro chuto" or iron cap in the "Catarrho Maligno" of the South American epidemic (1719). In England it was known as the "Gentle Correction." In the epidemic of 1675, Sydenham called the illness "Tussis Epidemica," to describe the cough which was prevalent without fever.

The contagious nature of the disease began now to receive more attention. In Germany it was described as a "Contagiosis Katahrr-fieber," and Calenus writes: "Especially are those prone to this sickness who converse much in society, while those of a more studious nature who lead a secluded life are less likely to be affected."

The first half of the 17th century was a period free from influenza in Europe, but marks its entrance into North America (1647), adding another hardship to those already endured by the early settlers of this country.

In the 18th century occurred seven epidemics. In the year 1780 the remarkable pandemic which, encircled the globe, carrying the disease into quarters of the earth previously known to be free from the disease. It originated in the fall of 1779 in China and India; in December entered Siberia and Russia; in February, Sweden and Denmark; and in the early spring Europe and the British Isles. In the fall of 1880 it had reached the western Hemisphere and continued to South America. It was known simultaneously in different countries as Chinese, Russian, Spanish, Italian, etc., according to the country from which it made its entrance, and was also called "La Petite Poste," "Le Petit Courtier," "Tac," "Galanterie," "Mode

Krankheit," "Blitz Katarrh," "The Blue Plague," "Grippe," from Agripper or Angreifen, to take hold, or from the name of an insect popularly supposed to be the cause of the disease.

The term influenza came now into general use, and in 1782 was formally adopted by the College of Physicians in London. It is Italian in origin and usually considered to signify the influence of the stars upon the disease, but the original etymology was probably different. The word "influxio" is the correct classical term for a humor, catarrh, or defluxion, and "influsso" is the Italian form. It was in 1743 that the Italian name was first brought into use in England during the epidemic in Rome, and after the epidemic of 1762 in England it was generally used to describe the disease.

The 19th century was marked by several epidemics in Europe and four in the Western Hemisphere, and by three pandemics, viz., 1830-1833, 1847-1848, and the years 1889-1890, all three of which had the same course from Asia to Russia and Europe, and then to the Western Hemisphere. The type of influenza of 1889 differed somewhat from previous invasions in that while catarrhal symptoms were present, the prostration and ensuing weakness were the most marked symptoms; but the chief characteristic of this epidemic, which made it unique in the long history of invasions was the recurrence of the epidemic in three successive seasons (for the period 1889-1894).

The present epidemic of the 20th century, while yet unwritten, has contributed a name to history—"Flu," descriptive not only of the disease but its power of mobility.

Etiology.—Not the least interesting in the history of influenza are the theories which from time to time have been brought forward to explain this illusive, universal disease which sweeps in waves over the earth at intervals, now of a few years, now of a century; sometimes in midsummer, again in midwinter; unmodified by civilization or sanitation. The descriptions of the disease in the medieval chronicles are as true a picture of influenza as those seen in the writings of to-day. The cause of the disease was sought in something as phenomenal as the disease itself, something telluric or cosmic. Accepting the Hippocratic doctrine of "epidemic constitutions," the mysterious something that set astir the epidemic wave was looked for in the air, in the variations of the atmosphere, upon the alterations of drought and moisture in the earth, in effluvia from the soil, emanations from animals, in earthquakes, volcanic eruptions, comets, and the relations of astral bodies.

In closing the historical sketch of influenza, it may be of interest to call attention to a remarkable theory of modern times, as ex-

pounded by Noah Webster, the lexicographer of this country, who, while a journalist in New York, wrote a history of "Epidemic and Pestilential Diseases." He says: "It seems probable to me that neither season, earthquakes, nor volcanic eruptions are the causes of the principal derangements we behold in animal and vegetable life, but are themselves the *effects* of those motions and invisible operations which affect mankind. Hence catarrh and other epidemics often appear *before* the visible phenomena of eruptions and earthquakes, and influenza is the effect of some excess of stimulant powers to the atmosphere by means of the electrical principle; for no other principle in creation which has yet come under the cognizance of the human mind seems adequate to the same effects."

GYNECOLOGIC AND OBSTETRIC CONDITIONS.

As we turn to Hippocrates to find the first treatise upon "Epidemical Diseases," so we may turn to him to learn the influence of influenza upon the genital tract in women. As it tallies so well with the experience of obstetricians in the epidemics of the 19th century, I will quote the statement in full.

"Many women were taken ill, but less than the men, and dy'd less. Many of 'em had hard labors and after the birth were taken ill again, and for the most part dy'd. A great many had their menses come down in their fevers, others bled at the nose and many young girls had the first appearance of their menses then . . . All of my acquaintance miscarried that chanced to be with child."

In considering gynecologic conditions, I will speak first of:

1. Cases with previously normal menstruation.

The influence of a severe attack of influenza upon menstruation is to markedly increase the flow if the onset of the disease coincides with the regular time of the menstrual period. The consensus of opinion is that menstruation does not render the individual more susceptible to influenza, but if the disease occurs it will often call back a menstruation after a normal period has ended several days before, or it will bring on a period before its time. In either case the flow lasts longer and is much more profuse than normally. The bleeding is hard to check and frequently lasts until the influenza symptoms subside. That it is a true menorrhagia and not a metrorrhagia is seen by the fact that the next menstrual period does not occur until four weeks later.

Müller and Gottschalk found the cervix and corpus uteri soft and swollen during influenza. The cavities of the uteri, as proved

by measurement with a uterine sound were increased in depth and in consistency felt like pregnant uteri. They were tender on both palpation and movement.

Often girls of ten or twelve years had their first period during an attack of influenza (Mynlieff, Felkin, Engel). Several instances are recorded of uterine bleeding after the menopause had long been passed (Leichternsten), and Engel reports three cases of amenorrhea cured by influenza, the menstruation being established first after an attack of influenza and continued normally thereafter.

Müller saw 48 cases of influenza and menstrual anomalies in	46
Felkin saw 100 cases of influenza and menstrual anomalies in	60
Engel saw 902 cases of influenza and menstrual anomalies in	265

2. Cases with known pathological lesions.

The tendency of chronic uterine or pelvic disease is to almost certain acute exacerbation of local infection (Ameiss, Müller, Stoltz, Kroenig). Inflammations are usually made worse by the influence of influenza, and tumors, both benign and malignant, increase rapidly in size (Stoltz and Leclerc).

According to Mynlieff, Gottschalk, and others, the cause of uterine bleeding is an acute infection of the mucous membrane of the uterus, as in other infectious diseases—viz., cholera, smallpox, typhus, and typhoid—as a result (1) of the intoxication of the blood; or (2) due to a reflex vasomotor disturbance of the uterus by infection in the respiratory or gastrointestinal tract; or (3) the bacillus itself causes an acute hemorrhagic endometritis.

In women the course of influenza is milder and convalescence is shorter, its influence being less upon the respiratory and gastrointestinal tract and greater upon the genital. It would seem that the uterine mucosa has an especial predisposition for the localization of this disease, due either to the pathological structure of the mucous membrane or to the conditions associated with it.

Taking up next, the obstetrical conditions, again the question of susceptibility arises, but pregnancy does not seem to make the individual more susceptible to influenza. In light attacks influenza has no effect upon mother or child (Jacquemier, Möller), but in severe cases it has a very grave influence upon both, and *vice versa*, pregnancy seems to exert an unfavorable influence upon the course of influenza.

For the sake of convenience, I will consider puerperal conditions.

First.—In the early months of pregnancy.

Abortion is likely to occur at any period of gestation, but more especially in the earliest months as the ovum is then more readily cast off, as shown in the following table.

Author:

	Cases	Aborted or premature delivery
1. Bar et Boule.....	50	16
2. Amann.....	16	6
3. Möller.....	21	11
4. Chaletain { before 7 months.....	26	4
{ after 7 months.....	12	6
5. Recau { before 7 months.....	28	5
{ after 7 months.....	15	7
6. Collis.....	27	7
7. Fischel.....	21	3
8. Mattous.....	20	3
9. Müller.....	21	7
	—	—
Total.....	257	75

That is, every third or fourth case of pregnancy aborted or had a premature delivery.

The expulsion of the ovum may be caused by the mechanical force exerted upon the uterus in coughing or, as Stoltz believes, by infection in the endometrium and hemorrhage into the ovum. This theory would be substantiated by the unusual friability of the ovum aborted during influenza.

Second.—In the later months of pregnancy.

Premature delivery when gestation is at or near term becomes a very grave complication of influenza, from the size of the fetus and the tendency to uterine hemorrhage. Death of the fetus in utero often occurs (Amann, Hintze), but whether this is due to a toxic influence upon the mucous membrane of the uterus, or directly upon the fetus; or whether the influenza infection may not in certain cases begin in the genitalia—as in a case of Thaler and Zuchermann—it is not possible to say. Numerous instances of mild symptoms of influenza have been reported in the newly born; and postmortem (Vinay) has shown the trachei and bronchi are injected, the lung tissue edematous, and the parenchyma in a state of atelectasis.

In severe cases of influenza with capillary bronchitis, dyspnea, cyanosis, or pneumonia, pregnancy may cause unfavorable influence by mechanical pressure upon the chest wall, and upon an already overburdened heart, but emptying the uterus does not better the condition (Kermauner). Placental bleeding is excessive at such a

time, and the uterus fails to contract. Usually in pregnancy cases complicated by heart or kidney disease, the condition is improved by delivery; but in infectious diseases this is not true, and the same seems to hold in influenza. In pregnancy there is a lowered resistance to general sepsis and the site of the placenta is a favorable terrain for a secondary localization of the general infection or an endometritis due to the pneumococcus.

Third.—Influenza during labor.

If the disease develops in the course of or shortly before labor, the pains may be excessive but are lacking in force, labor is tedious, and atony of the muscle results (Möller). The lochia is bloody and profuse for a longer period than usual, and involution is slow (Amann Hintze, Engel).

Fourth.—Influenza during the puerperium.

The chances of a severe course of the disease and general infection are much greater in the lying-in period, as the uterine mucosa furnishes favorable ground for the infection. If the disease does not occur until the puerperium it may be difficult to diagnose from puerperal sepsis, but throat and chest symptoms associated with pain in limbs, back, and head are almost pathognomonic (Ameiss), while the high temperature but lower pulse rate may aid the differential diagnosis. The puerperium is longer, as subinvolution is slower, and bleeding often continues for the duration of the influenza symptoms.

CONCLUSIONS.

1. Mild attacks of influenza have no influence upon gynecologic or obstetric conditions.
2. Severe attacks of influenza produce menorrhagia and exacerbation of chronic gynecologic conditions.
3. Severe attacks often cause abortion, premature delivery, or stillbirth.
4. Labor is prolonged and tedious.
5. Pregnancy has an unfavorable influence upon the course of a bronchitis or pneumonia in influenza.
6. Induction of labor has no beneficial effect upon the course of influenza.
7. The chances of general infection are greater if influenza occurs during the puerperium.

RIVERSIDE DRIVE AND ONE HUNDRED AND TENTH STREET.

BIBLIOGRAPHY.

1. Amann. Studien über Influenza bei Schwangeren Kreissenden und Wöchnerinnen. *Müncher med. Wochenschr.*, xxxvii, 162-186, 1890.
2. Ameiss. Influenza Complicating Uterine and Pelvic Disease and Pregnancy. *AMER. JOUR. OBST.*, xxxix, 509, 1899.
3. Ballantyne, J. W. The Relation of Influenza to Gynecological, Obstetrical, and Pediatric Cases. *Obstetrical Transactions*, Edinburgh, xix, 33, 1894.
4. Bar, Paul. La Grippe dans ses rapports avec la Puerpéralité. *Jour. des Sages Femmes*, xxvi, 25, 1898.
5. Bar et Boule. Grippe et Puerpéralité. *Rév. Internat. de Med. et de Chir. Prat.*, ix, 227, 1898.
6. Creighton, Charles. History of Epidemics in Great Britain, 1891.
7. Engel, Gabriel. Der Einfluss der Influenza auf den Weiblichen Organismus. *Centralbl. für Gynäk.*, xxiv, 1897.
Engel, Gabriel. Einfluss der Influenza auf den Weiblichen Organismus. *Wiener med. Presse*, xxxvii, 1336, 1896.
8. Gottschalk, Sigmund. Eine Weitere Mittheilung über die Beziehungen der Influenza zu Erkrankungen der weiblichen Genitalien. *Centralbl. für Gynäk.*, xvi, 49, 1892.
Gottschalk, Sigmund. Über den Einfluss der Influenza auf Erkrankung der weiblichen Genitalien. *Centralblatt für Gynäk.*, xiv, 41, 1890.
9. Hamm. Die Puerperale Wundinfektion. S. 94, Berlin, 1912.
10. Hintze. Diskussion über den Einfluss der Influenza auf Schwangere, Kreissende und Wöchnerinnen. *Centralbl. für Gynäk.*, li, 1896.
11. Hippocrates. Epidemical Diseases. Translated and Methodized by Frances Cifton, 1752.
12. Jacquemier. Avortement. In Dictionnaire Dechambre.
13. Kermauner. Beziehungen Zwischen dem Respiration apparat und den Funktionen und Erkrankungen der Weiblichen Geschlechtsorgone. Nothnagel Spezielle Pathologie und Therapie, I, Supple. p. 287, 1912.
14. Leclerc. Über den Einfluss der Influenza auf das Wachstum der Geschwülste der weiblichen Geschlechtsteile. *Inaug. Diss.*, Strassburg, 1891.
15. Leichtenstern. Influenza und Dengue. Nothnagel, Spezielle Pathologie und Therapie, 41, 1, 1896.
16. Möller. Bericht über die Influenza-Epidemic im Februar 1900 in der Geburtshilflichen Klinik in Greifswald. *Münchener med. Wochenschr.*, xxix, 467, 1900.
17. Müller. Beobachtungen über den Einfluss der Influenza auf den weiblichen Sexual Apparat. *Centralbl. für Gynäk.*, xiv, 297, 1890.
- Müller. Weitere Beobachtungen (bezüglich des Einflusses der Influenza auf den weiblichen Sexual Apparat. *Münchener med. Wochenschr.*, xlii, 952, 1895.

18. Mÿnlieff. Neders tydschr von Geneeskunde. *Centralbl. für Gynäk.*, 188, 1891.
19. Mÿnlieff. Action de l'influenza sur la menstruation, la grossesse et les suites de couches. *Nouvelle Arch. Obstetrique*, 450, 1890.
20. Porter, Henry H. Influenza as Epidemic Catarrh, 1832.
21. Pruska. Puerperale Pneumokokkensepsis. *Centralbl. für Gynäk.*, xxx, 503, 1906.
22. Ricau. De la Pneumonie pendant la grossesse. *Thèse de Paris*, 1874.
23. Thaler und. Zukermann. Über eine genitale Influenza infektion. Bei einer Gebärenden als Ursache eines Puerperalfiebers. *Monat. für Geb. u. Gyn.*, xli, 377, 1915.
24. Thompson, Theophilus. *Annals of Influenza*. London, 1852.
25. Vinay. De l'Influenza chez les Femmes en état de Puerpéralité. *Lyon Med. Jour.*, lxi, 247-280, 1892.
26. Wassermann. Einige Beiträge zur Pathologie der Influenza. *Deutsche med. Wochenschr.*, xxviii, 445, 1900.
27. Webster, Noah. *Epidemic and Pestilential Diseases*, 1800.