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The Rise and Fall of Childbed Fever

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Childbed fever is one of the oldest diseases known to man. It strikes women within hours or days of giving birth and has therefore been also called puerperal fever, or more recently puerperal sepsis. No disease, except perhaps for rickets, has had a greater impact on childbirth or on the fear with which it came to be regarded. I intend to trace the course of this disease over a period of 2½ thousand years using the observations and contributions of twelve doctors and one nurse as stepping stones in the rise and subsequent fall of this scourge of reproduction.

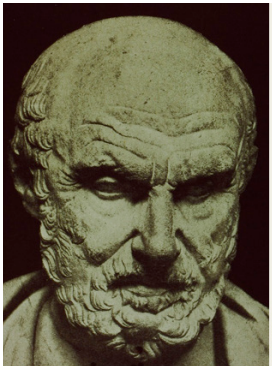


Fig 1
Hippocrates (460-c356BC).

As is so often the case we must reach back to Hippocrates of Cos (406-356BC) for our first stepping stone (Fig 1).

Hippocrates lived some 400 years before Christ. He was the first to mention childbed fever, writing:
'Erysipelas attacking the internal surface of the pregnant uterus is destructive.' (1)
As we shall see it is especially interesting that he used the term erysipelas.

Fig 2.
Soranus of Ephesus (c AD 98-138)

400 years later Soranus of Ephesus (c AD 98-138) (Fig 2) provided a more complete clinical picture of puerperal inflammation of the uterus:
'The general signs which appear are the following: fever, furthermore pain and pulsation of the affected part, swelling and (rigidity), heat

and dryness of the abdomen, tense feeling in the hips or heaviness in the loins, flanks, lower abdomen, groins and thighs, spells of shivering, a stabbing sensation, numbness of the feet and coldness of the knees, profuse perspiration, a small and very rapid pulse, sympathetic affection of the stomach, fainting, and weakness ... If the inflammation becomes worse, fever and swelling of the abdomen increase, delirium sets in as well as gnashing of the teeth (and) convulsions.'(2)

Fig 3
Dr. William Harvey (1578-1657)

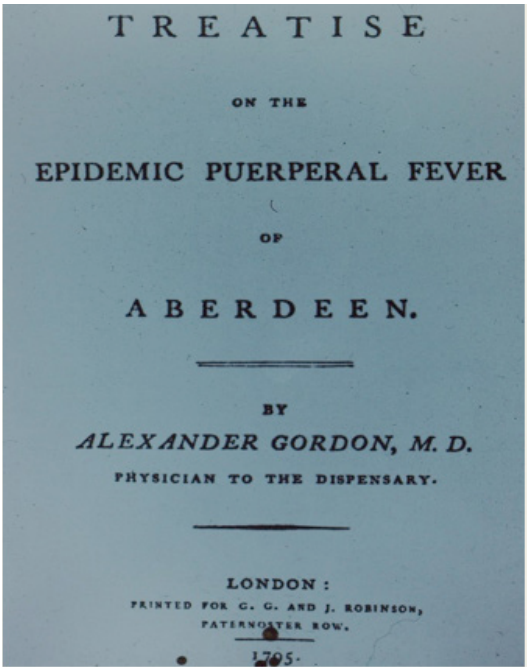
The next significant contribution came with the Renaissance 1500 years later. The famous William Harvey (1578-1657) (Fig 3) wrote in 1650:

'It often happens especially in delicate women, that foul and putrid lochia set up fevers and other violent symptoms. Because the uterus, torn and injured by the separation of the placenta, especially if any violence has been used, resembles a vast internal ulcer, and is cleansed and purified by the free discharge of the lochia. Therefore, we do conclude as to the favourable or unfavourable state of the puerperal woman from the character of these secretions.' (3)

Fig 4
Charles White of Manchester (1728-1813).

In 1773 the great obstetrician, Charles White of Manchester (1728-1813) (Fig 4), recognised that childbed fever was contagious and that there was a need to isolate affected patients and to disinfect their rooms and bedding after use. Above all, he stressed the importance of prevention of the disease by strict cleanliness, good ventilation, and the encouragement of free drainage of the lochia by nursing the post-partum mother in a sitting position, and by early ambulation. After 21 years in practice, and at a time when one in 25 parturient women were dying from puerperal sepsis, he was able to claim that he had never lost a patient from this disease [(4)].

In the 18th and 19th centuries women, especially the poor, were increasingly delivered in hospital and the occurrence of epidemics of puerperal fever increased dramatically.


TREATISE

ON THE

EPIDEMIC PUERPERAL FEVER

OF

ABERDEEN.

BY

ALEXANDER GORDON, M. D.

PHYSICIAN TO THE DISPENSARY.

LONDON:

PRINTED FOR G. G. AND J. ROBINSON,

PATERNOSTER ROW.

1795.

Figure 5
Frontpiece to Alexander Gordon's Treatise in 1795.

In 1795 the contagiousness of puerperal sepsis was emphasised by Alexander Gordon of Aberdeen (1752-1799). That city had experienced two serious epidemics in 1789 and 1792 (Fig 5). He wrote:

'... the cause of the epidemic puerperal fever is not owing to a noxious constitution of the atmosphere ... but this disease seizes such women only as were visited, or delivered, by a practitioner or taken care of by a nurse who had previously attended patients affected with the disease. In short, I had evident proof of its infectious nature, and that the infection was as readily communicated as that of the smallpox or measles, and operated more speedily than any other infection with which I am acquainted.' (5)

Gordon also emphasised the relationship between erysipelas and puerperal sepsis, writing:

'The analogy of the puerperal fever with erysipelas will explain why it always seized women after and not before delivery. For at the time when erysipelas was epidemic, almost every person admitted into our hospital with a wound, was, soon after his admission, seized with erysipelas in the vicinity of the wound.' [5]

He added that:

'The patient's apparel and bedclothes ought to be burnt or thoroughly purified; and the nurses and physicians who have attended patients affected with the puerperal fever, ought carefully to wash themselves and to get their apparel properly fumigated before it be put on again.'[5]

Fig 6
Robert Collins, Master of the Rotunda Hospital in Dublin (1826-1833).

The discovery of chlorine in 1774 had led gradually to its use as a disinfectant both of the hands as well as of the hospital wards and post-mortem rooms. In the 1830s, Robert Collins, master of the Rotunda Hospital, Dublin, (Fig 6) described how he terminated

a series of epidemics of puerperal sepsis in his Hospital. After temporary closure of the hospital, its contents were thoroughly cleansed and then fumigated with chlorine. Thereafter similar treatment was repeated ward by ward in rotation every 10 to 12 days. He reported in 1835 that in the last four years of his mastership:

'We did not lose one patient by this disease among 10,785 deliveries.' [6]

Following Collins' retirement as Master, the use of chlorine was discontinued and within a short time there was another serious epidemic of puerperal fever.

Meanwhile in the crowded public hospitals of Paris, London, Vienna and other large cities the ravages of puerperal fever were extremely severe.

Fig 7
Oliver Wendell Holmes of Boston (1809-1894)

In 1843 Dr. Oliver Wendell Holmes of Boston (1809-1894) (Fig 7), although not himself an obstetrician, convincingly marshalled the evidence demonstrating again that puerperal fever was

contagious and was often spread between patients by their medical attendants. He concluded his thesis with a series of pertinent recommendations on how to prevent the disease, ending with the following exhortation:

'Whatever indulgence may be granted to those who have heretofore been the ignorant causes of so much misery, the time has come when the existence of a private pestilence in the sphere of a single physician should be looked upon not as a misfortune but as a crime.' [7]

Yet in spite of his plea, there were still many in Europe and America who for another twenty-five years or more, refused to accept the evidence. Thus, Professor Charles Meigs of Philadelphia wrote in 1848:

'Having practiced midwifery a great many years and having been concerned in the visitation of the sick labouring under puerperal fever ... visiting the same cases with those who have been so cruelly abused, as performing the part of a walking pestilence, scattering death and desolation where they desired only to do good – and seeing that I could never convict myself of being the means of spreading the contagion, I remain incredulous as to the contagiousness of the malady'.[8]

At much the same time as Holmes published his thesis, a young Hungarian obstetrician, Ignac Semmelweis (1818-1865) (Fig 8), was undertaking his own observations in the Vienna Krankhenhaus, where at that time one in seven delivered women were dying of puerperal fever. He, like Armstrong and Holmes before him, drew attention to the death from erysipelas and blood poisoning of doctors who had cut themselves while undertaking post-mortems on women dying of puerperal sepsis. His observations led him to similar conclusions to those of Armstrong and Holmes both as to cause and prevention. Although he spoke of his findings in 1850, because of illness (he contracted syphilis and departed hastily to Budapest) he did not actually publish his work until 1861[9,10].

Fig 8
Professor Ignaz Semmelweis
(1818-1865).

Fig 9
Florence Nightingale
(1820-1910).

In it he described the guilt he felt at having himself spread this fatal disease. He wrote:

'Early (each) morning I conducted my gynaecological studies in the morgue. I then went to the labour room and began to examine all the patients, as I was obliged to do, so that I could report on each patient during the professor's morning rounds. My hands, contaminated by cadaverous particles, were thereby brought into contact with the genitals of many women in labour ... In consequence of my conviction I must affirm that only God knows the number of patients who went prematurely to their graves because of me.'[9,10]

Shortly after Semmelweis's report, which incidentally aroused a storm of protest and disbelief from many obstetricians throughout Europe, Florence Nightingale (1820-1910), famed for her work during the Crimean War, (Fig 9) was invited in 1867 to investigate an outbreak of puerperal sepsis at Kings College Hospital. In 1871 she reported her findings which included a list of the risk factors for puerperal fever and also the means of prevention [11].

'In future lying-in establishments should be well situated and isolated

from any general hospital or medical school; the wards should be small and constantly rotated in use; they should be frequently cleaned with lime washing; deliveries should be conducted by midwives specially attached to the labour wards; whenever possible the same birth attendant should look after mother and baby throughout; there should be early home discharge of the mothers; cases of puerperal fever should be immediately isolated; and there should be a reduction of intercommunication between lying-in and hospital divisions in terms of medical officers and nurses.[11]

Fig 10
Louis Pasteur of Paris (1822-1897).

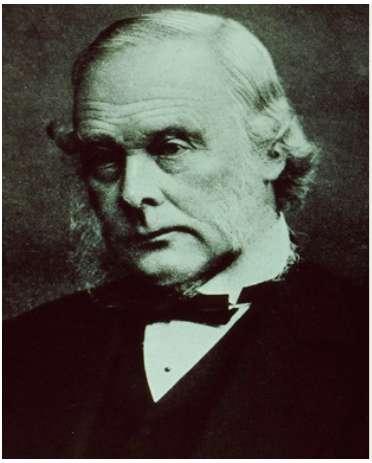


Fig 11
Lord Joseph Lister (1827-1912).

Between the 1850s and 1870s the discoveries of Louis Pasteur of France (1822-1897) (Fig 10), and Joseph Lister (1827-1912) in the UK (Fig 11) threw light on the bacterial nature of many diseases, including wound sepsis and puerperal infection and also on the means of prevention, using first antisepsis with the carbolic acid spray and later an aseptic approach. Yet Lister's attempts to achieve antisepsis in surgical operating rooms met fierce opposition

for many years both from administrators, physicians and surgeons who still disbelieved the germ theory of infection. However, the work of bacteriologists such as Robert Koch of Germany (1843-1919) slowly won the day and it was Pasteur himself who in 1879 finally identified the beta-haemolytic streptococcus as the organism mainly responsible for puerperal fever [(12)].

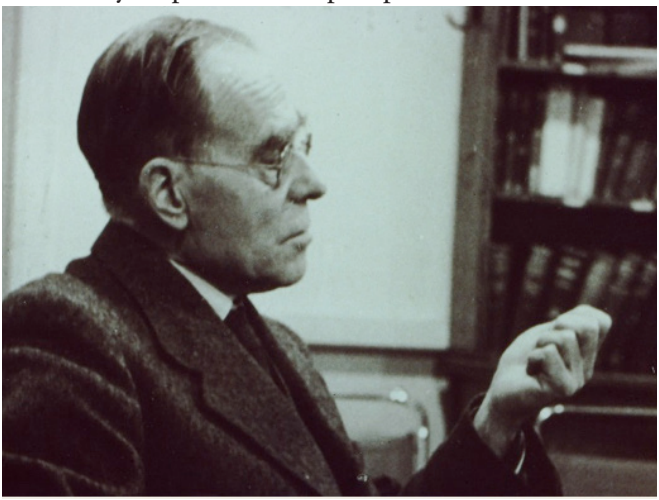


Fig 12
Dr. Leonard Colebrook 1883-1967).

In spite of these advances, including the use of heat sterilisation of instruments and the introduction of rubber gloves, puerperal fever continued to be a problem in maternity hospitals for several decades to come. Only with the advent of chemotherapy and then antibiotics was this scourge of childbirth finally defeated. In 1935 Professor Dogmagk of Germany introduced the bacteriostatic drug prontosil and within a year Dr. Leonard Colebrook (1883-1967) (Fig 12) had demonstrated in the UK the remarkable effectiveness of both this drug and its derivative, sulphonamide, in the treatment of puerperal fever [(13)].

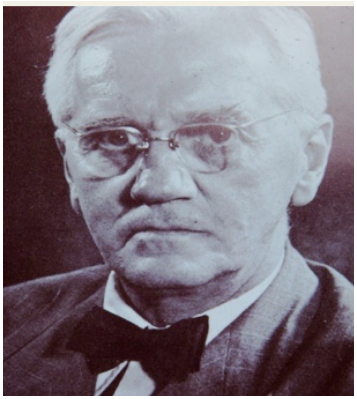


Fig 13
Sir Alexander Fleming (1881-1955).

Fig 14
A culture of Fleming's penicillium notation demonstrating the inhibition of bacterial growth.

Meanwhile the bacteriologist, Alexander Fleming (1881-1955) (Fig 13), had observed in 1928 a stray mould, penicillium rubens, growing on a plate of bacteria. Around the mould was a clear area where the bacteria had been killed (Fig 14). He recognised the significance of this observation and attempted without success to purify this bactericidal substance which he named penicillin[14.] It remained for Howard Florey (1898-1968) (Fig 15) and Ernest Chain working in Oxford to succeed in the production of penicillin in 1941 where Fleming had failed.

Fig 15
Baron Howard Florey (1898-1968).

This antibiotic was introduced into the treatment of puerperal sepsis in 1945. The success of the sulphonamides and subsequently of penicillin in combating puerperal sepsis was reflected in the falling maternal mortality figures for England and Wales that you see in this graph (Fig 16).

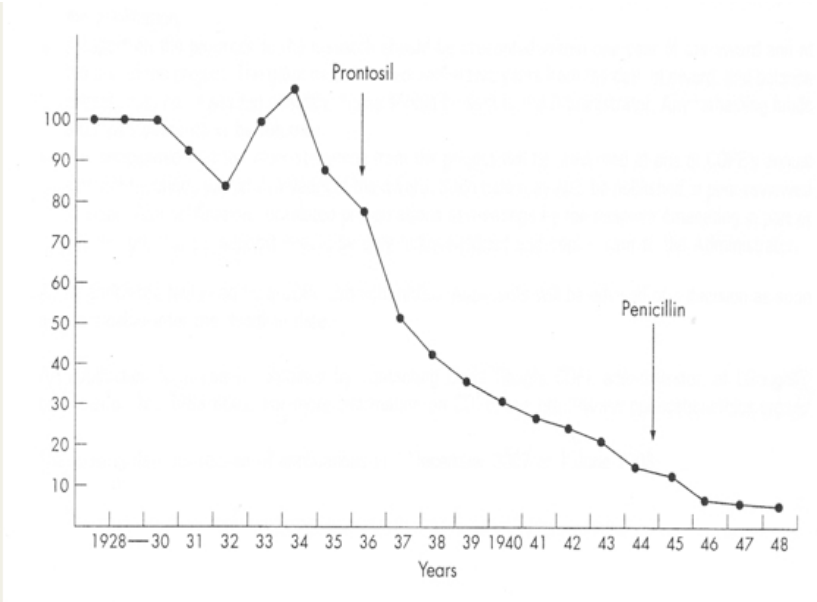


Fig 16
Puerperal sepsis mortality in England and Wales, 1928-30 is taken as 100 and the total for each subsequent year expressed in terms of that.

This account of the rise and the eventual fall of childbed fever over the years reveals how often the brilliant observations of certain doctors were either ignored, neglected or even opposed by their colleagues. The story emphasises the importance of and the need for doctors to have a knowledge of medical history.

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