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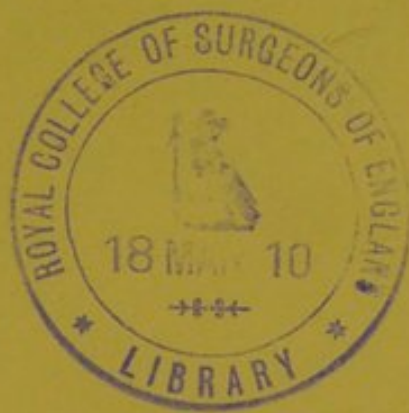
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From "THE PRACTITIONER" for August, 1906.

CHOREA GRAVIDARUM.

By HERBERT FRENCH, M.A., M.D. (OXON.), M.R.C.P.,
Medical Registrar, Guy's Hospital; and

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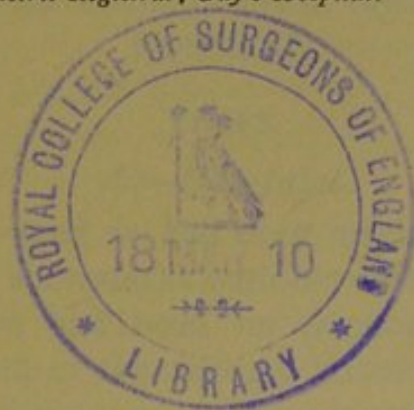


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*Cause.*¹—She could assign none.

Temperature.—There was no pyrexia.

Case 2.—E. B., aged 19, was unmarried, but pregnant seven months of her first child.

History.—The patient had had acute rheumatism two years before. The choreic movements began suddenly three days before admission. They were general but mild. There were aortic and mitral bruits.

Result.—On medical treatment the movements ceased after a fortnight, and she went out still pregnant.

Cause.—Illicit pregnancy? Rheumatic?

Temperature.—There was no pyrexia.

Case 3.—A. B., aged 20, had been married ten weeks, and was pregnant two months of her first child.

History.—Three months before marriage, the patient was frightened by a burglar, and slight chorea set in. She recovered from this. The movements recurred, after another fright, at the end of the second week of pregnancy. They were general but mild.

Result.—Recovery was rapid and the pregnancy was unharmed.

Cause.—Attributed to fright.

Temperature.—There was no pyrexia.

Case 4.—M. B., aged 20, had been married six months and was now pregnant five months with her first child.

History.—There had been no previous chorea, or rheumatism. The present attack came on gradually at the fourth month of pregnancy. The movements were mild, and confined to the left arm and leg.

Result.—Recovery was rapid, and the pregnancy continued undisturbed.

Cause.—She could assign none.

Temperature.—There was no pyrexia.

Case 5.—E. C., aged 22, had been married several years, and had had two normal confinements. She was now pregnant three months with the third child.

¹ By "cause" we have tried to indicate the factor to which the patient herself attributed the onset of chorea. Where a ? is put the "cause" is the one suggested by us.

History.—There had been no previous chorea, or rheumatism. Choreic movements began at the end of the first month, and increased to such an extent that, on admission to hospital, she had to be placed in a padded bed. There were no bruits.

Result.—Recovery, under ordinary treatment, was rapid; and the patient left the hospital with but very slight movements in three weeks. The pregnancy continued.

Cause.—She assigned none.

Temperature.—There was no pyrexia.

Case 6.—M. C., aged 22, had been married one year and ten months. She was now pregnant for the first time, at the fourth month.

History.—She had had chorea at the age of 12. The present attack began when she was pregnant two and half months. The movements were slight, and confined to the right arm and leg. There was a local apical systolic bruit.

Result.—The attack subsided rapidly in hospital, and she took her discharge in nine days; the pregnancy continued.

Cause.—She assigned none. Rheumatic?

Temperature.—There was no pyrexia.

Case 7.—L. D., aged 27, had been married ten years and had had two children, nine and seven years ago respectively; she was now pregnant seven months.

History.—There had been no previous chorea or rheumatism. The present attack began at six and a half months of pregnancy. The movements were mild, and confined to the left side. There was well-marked mitral stenosis, with complete compensation.

Result.—The movements ceased in ten days, and four days later the patient went home, still pregnant.

Cause.—She assigned none. Rheumatic?

Temperature.—There was no pyrexia.

Case 8.—E. F., aged 21, was unmarried, but was now six months pregnant.

History.—She had had no previous chorea, or rheumatism; the present attack began at the fourth month of pregnancy. The movements were general, but mild. There was no heart lesion.

Result.—She got quickly well, going out in seven days, still pregnant.

Cause.—Illicit pregnancy?

Temperature.—There was no pyrexia.

Case 9.—M. F., aged 23, was married, and had had two children previously without trouble. She was now five months pregnant.

History.—She had had an attack of rheumatism seven months ago. The movements began at the fourth month of pregnancy; they were general, but mild. The heart was normal.

Result.—She got quickly well, and pregnancy continued.

Cause.—None was assigned. Rheumatic?

Temperature.—This was never above 98° F.

Case 10.—C. H., aged 20, had been married five months, and was now pregnant three and a half months.

History.—She had had one attack of chorea, lasting three weeks, two years ago. The present attack began at the second month of pregnancy. The movements were general, but mild. There was a local apical bruit.

Result.—She got quickly well, and went out in thirteen days, still pregnant.

Cause.—None was assigned. Rheumatic?

Temperature.—There was no pyrexia.

Case 11.—F. K., aged 31, had been married ten months, and was now pregnant eight and a half months with her first child.

History.—She had had chorea once previously, in childhood. The present attack came on at the end of the seventh month of pregnancy. The movements were general but mild. The heart was normal.

Result.—The movements rapidly subsided before the birth of the child, and she went through labour naturally at term.

Cause.—None was assigned. Rheumatic?

Temperature.—There was no pyrexia.

Case 12.—R. H., aged 21, was married, and was now pregnant at full term with her first child.

History.—She had had chorea previously at 15. The present attack began gradually at the sixth month of pregnancy.

The movements were general but mild. She attended the out-patient department, improved, and left off coming. She relapsed at eight and a half months, and was then admitted.

Result.—Labour came on spontaneously at term, and during the pains there was exaggeration of the choreiform movements. The child lived. The chorea in the mother subsided quickly. The lochia became foul. The temperature rose to 100° F. Notwithstanding local peritonitis, the patient made a good recovery.

Cause.—None was assigned. Rheumatic?

Temperature.—There was no pyrexia.

Case 13.—M. B., aged 17, was married, and now five months pregnant with the first child.

History.—She had had chorea before, when a child; and one attack of acute rheumatism a year ago. When nearly three months pregnant she fell downstairs, and was very much frightened. The present chorea dated from this. The movements were general and of moderate severity. There was a local apical systolic bruit.

Result.—After two weeks in hospital, the movements had quite ceased. She went out, the pregnancy continuing normally.

Cause.—Fright. Rheumatic?

Temperature.—Never above 98·6° F.

Case 14.—E. M., aged 20, had been married six months and was admitted when two months pregnant with her first child.

History.—There had been no previous chorea, or rheumatism. The movements began at the end of the first month, they were general and severe. There was no heart lesion.

Result.—She remained in hospital 17 days, and went out well; the pregnancy continued.

Cause.—None was assigned.

Temperature.—There was no pyrexia.

Case 15.—E. P., aged 27, was unmarried, but pregnant four and a half months.

History.—She had had chorea and acute rheumatism

previously, at 13 and 15 respectively. She had well-marked mitral stenosis. The movements began in the middle of the third month; they were general, and of moderate severity.

Result.—She lost her chorea in 27 days from admission. The pregnancy continued.

Cause.—She assigned none. Rheumatic?

Temperature.—This was for the most part normal or subnormal, but on three occasions in four weeks was 99° F.

Case 16.—E. P., aged 20, had been married nine months, and was now pregnant seven months of her first child.

History.—She had had chorea at 14; but no acute rheumatism. The present attack began at the fifth month; the movements were general, but not so severe as in her previous attack. The patient was able to feed herself.

Result.—Labour was induced soon after admission; the movements became more violent after the induction, and the patient was so ill that she was not able to leave the hospital for 53 days; slight choreic movements were still present on her discharge.

Cause.—She assigned none. Rheumatic?

Temperature.—There was no pyrexia above 99° F.

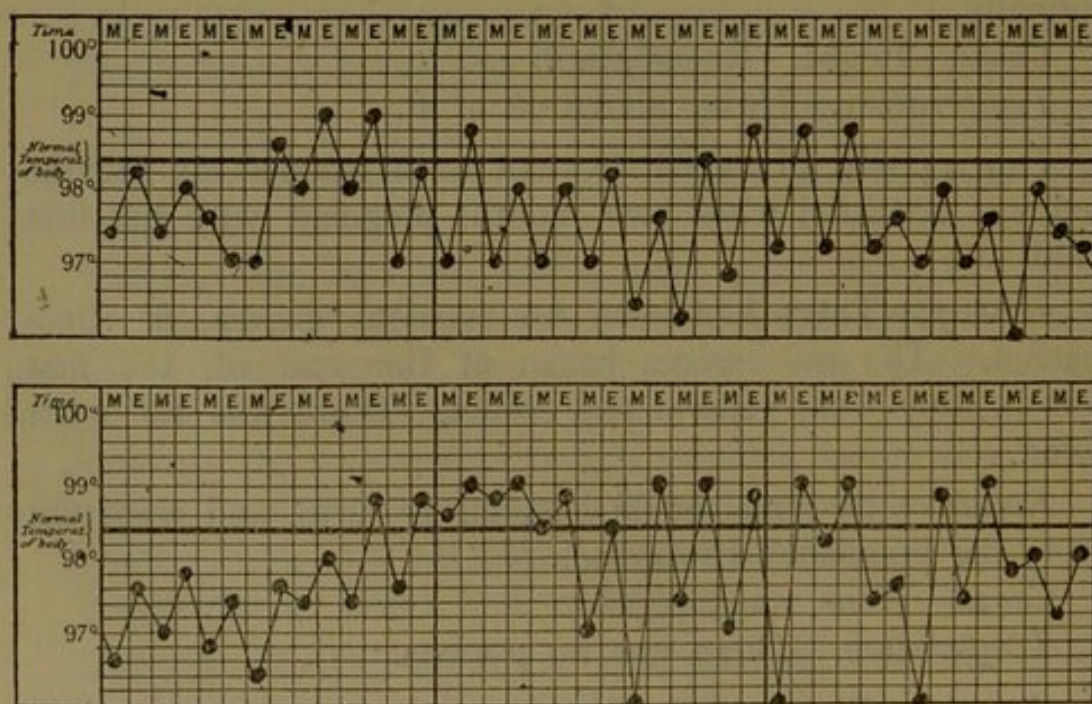


Fig. 1. Temperature chart of Case 16, showing absence of pyrexia above 99° F., though the case was long and severe.

Case 17.—H. S., aged 25, was married and had had four children; she was eight months pregnant of her fifth child on admission.

History.—She had had chorea severely at 18, before marriage; and was in hospital for it four months. She had a second attack with her first pregnancy, beginning at the fifth month, and lasting until a month after delivery of a living child at full term. There had been no recurrence with the second, third and fourth children. There had been no acute rheumatism, and there was no heart lesion. The present attack began gradually about the middle of pregnancy; the movements were general and moderately severe.

Result.—She went to full term, and was delivered in hospital of a living child. The movements improved greatly after delivery, and she went out nearly free from them a fortnight after labour.

Cause.—She assigned none. Rheumatic?

Temperature.—There was no pyrexia.

Case 18.—E. W., aged 21, was unmarried, but pregnant four and a half months of her first child.

History.—There had been no previous rheumatism or chorea. The heart was normal. The present attack began at the second month of pregnancy. The movements were general but mild.

Result.—She improved quickly, and was in hospital 17 days. The pregnancy continued.

Cause.—She assigned none.

Temperature.—There was no pyrexia.

Case 19.—E. Y., aged 23, had been married four years, and had had one child. She was now three months pregnant of the second.

History.—There had been no previous rheumatism; but at the second month of her first pregnancy she had chorea, which lasted three weeks. She got quite well of it, and bore a living child at term. The present attack also began at the second month. The movements were general but mild. The heart was normal.

Result.—She got rapidly better, and the movements had almost ceased when she went out in four days. The pregnancy continued.

Cause.—She assigned none.

Temperature.—There was no pyrexia.

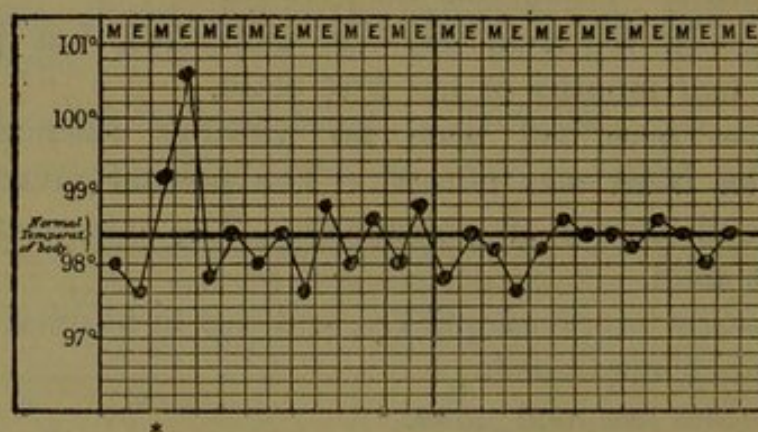
Case 20.—A. W., aged 30, had been married twelve months, but had had one child before marriage without chorea. She was now pregnant eight and a half months of her second child.

History.—She had had five previous attacks of chorea, in childhood, but no acute rheumatism; the heart was normal. The present attack began when she was seven months pregnant. The movements were general and of moderate severity.

Result.—The child was spontaneously born dead soon after admission. The movements rapidly ceased, and the patient went home in fourteen days.

Cause.—She assigned none. Rheumatic?

Temperature.—Normal before delivery, it rose to 100.4° F. the evening of delivery, and after that never exceeded normal.



* Day of delivery.

Fig. 2. *Temperature chart of Case 20.*

Case 21.—M. J., aged 25, had been married ten years, and had had two children before admission. The first was born dead at the eighth month, eighteen months after marriage; the second was born dead at the fifth month, a year ago. She was now pregnant at the fifth month. There was no cardiac bruit.

History.—Within a year of marriage, she had her first attack of acute rheumatism, followed by chorea; the latter had not quite ceased when she became pregnant. The choreic movements then increased in severity, particularly from the

second month, and lasted until a month after this first child was born. Chorea recurred at the second month of the next pregnancy, and ceased a month after the miscarriage. Movements again came on at the second month of the third pregnancy; they were moderately violent, and persisted, unaltered, until six and a half months, at which time the foetus died in utero.

Result.—The dead foetus was retained till the seventh month, when it was expelled in a macerated condition. The chorea, though less violent from the time of foetal death, was still present in mild degree upon discharge a fortnight after delivery.

Cause.—She assigned none. Rheumatic?

Temperature.—This remained normal throughout.

(*Note.*—It was thought that the foetus might have been poisoned by the arsenic used in the treatment of the other. The placenta and foetus were both examined for arsenic, but none could be detected.)

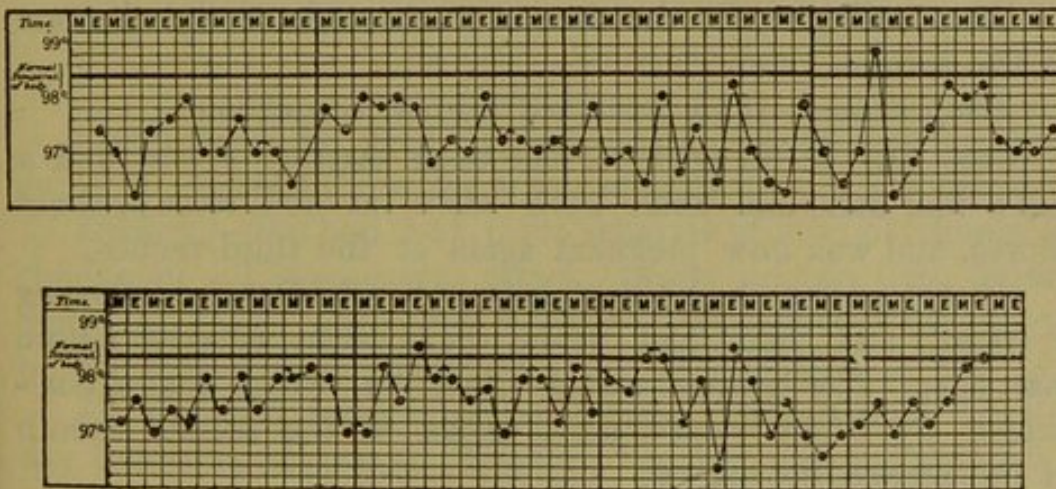


Fig. 3. *Temperature chart of Case 21, showing absence of pyrexia in non-fatal case, notwithstanding presence of dead foetus in utero.*

Case 22.—S. F., aged 22, had been married five years, and had had two children without chorea. She was pregnant seven months of her third.

History.—She had had no previous acute rheumatism, or chorea. The present movements began at the fourth month. She attributed them to nervousness following the long illness

and death of her second child. The chorea was violent and constant. There was no definite heart lesion.

Result.—After eighteen days in hospital the movements were so much relieved that she chose to go home, still pregnant.

Cause.—Worry.

Temperature.—There was no pyrexia.

Case 23.—L. G., aged 20, was married, and now pregnant seven months of her second child.

History.—She had had no chorea, nor acute rheumatism before marriage. During her first pregnancy, following a severe fright given her by her husband, she had slight chorea, which persisted until delivery of a living child at term, when the movements gradually ceased. During this second pregnancy the chorea recurred, beginning at the first month, and never becoming very severe.

Result.—The movements were less on discharge from hospital, but persisted till full term, when a living child was born.

Cause.—Fright, in the first instance; she assigned none in the second.

Temperature.—This remained normal throughout.

Case 24.—E. B., aged 30, had been married a year and a half; had had one child born alive at full term without chorea, and was now pregnant again at the third month.

History.—She had had chorea in childhood, following a fright, and had had acute rheumatism shortly before marriage. The present attack of chorea, which was accompanied by slight rheumatism, began in the second month of the second pregnancy.

Result.—The movements were general, and moderately severe; the patient went home nearly free from them, and still pregnant.

Cause.—She attributed the chorea to worry at the death of her first child. Rheumatic?

Temperature.—This never exceeded 99° F.

Case 25.—E. S., aged 20, was married, and was now pregnant six months of her first child.

History.—The father died of acute rheumatism and heart disease. A year before marriage the patient had her first

attack of chorea; the choreic movements had never completely ceased. They were exaggerated from the first month of the present pregnancy, but were never severe.

Result.—She went out still pregnant, slight chorea being still present.

Cause.—She assigned none. Rheumatic?

Temperature.—There was no pyrexia.

Case 26.—B. S., aged 26, was married, and was now pregnant seven months for the first time.

History.—She had had chorea as a girl. The present attack came on at the sixth month; the movements were general, and moderately severe. There was mitral regurgitation.

Result.—The movements gradually diminished, but were still slightly present when she went home still pregnant, after being in hospital 30 days. The child was born alive at full term.

Cause.—She assigned none. Rheumatic?

Temperature.—During the 30 days that she was in the ward the temperature once rose to 99.4° F., once to 99.2° F.; for the rest it was normal.

B.—Fatal.

Case 27.—A. H., aged 21, had been married four months, and was pregnant three and a half months for the first time.

History.—She had had three separate attacks of chorea in childhood. The present attack began acutely just before admission. The movements became so violent that she had to be watched day and night in order to keep her in bed.

Result.—She became semi-comatose, and aborted on the day following admission. She died the day after the abortion.

Cause.—She assigned none. Rheumatic?

Temperature.—This was 100° F. on admission, and rose to 105° F. before death.

Autopsy.—There were acute recent endocarditis and parotitis; cultivations made from heart-blood, spleen, and cerebro-spinal fluid all remained sterile.

Case 28.—R. D., aged 21, had been married four months, and was pregnant at the second month for the first time.

History.—She had had no previous chorea nor acute rheumatism. The present chorea began at the second week of

Case 29.—G. H., aged 23, had been married six years, and had had three children without chorea. She was now pregnant six and a half months.

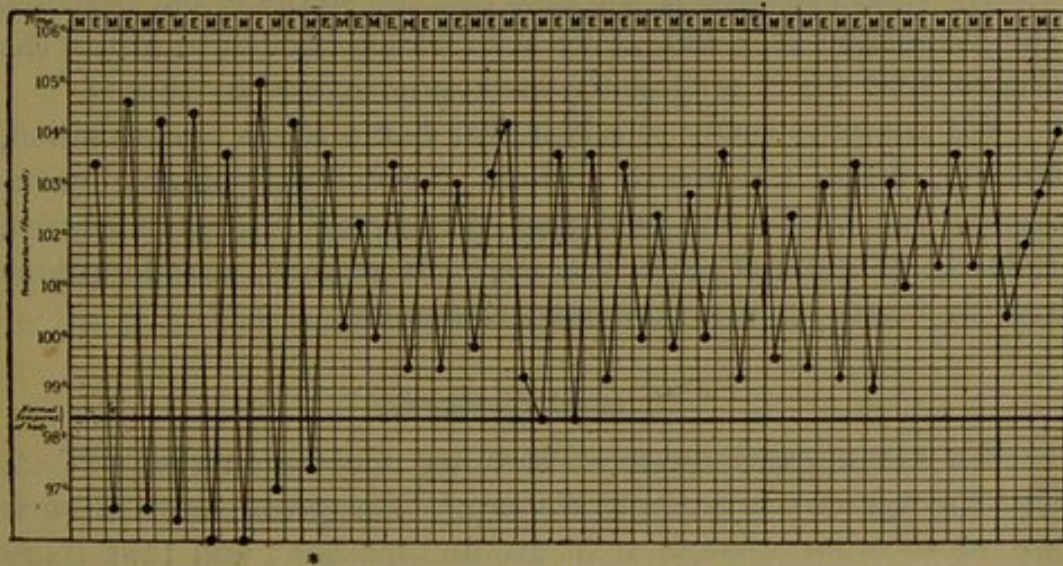
History.—She "had never been ill in her life before," but there was a local apical systolic bruit. The chorea began about the middle of this pregnancy. Two weeks before admission, illness began suddenly with a "fit" accompanied by coma and transient right-sided hemiplegia. On recovery, slight choreic movements set in, affecting both sides, but mainly the right side.

Result.—She became extremely ill, with rigors. The chorea was never more than slight. She miscarried eight days after admission, and died three weeks later. Her clinical condition was one of infective endocarditis.

Cause.—She assigned none.

Temperature.—(*Vide* chart.)

Autopsy.—There was old mitral stenosis, with more recent fungating endocarditis. There were general infarcts, embolism of left middle cerebral artery, and thrombosis of the left iliac and femoral veins.



* Spontaneous miscarriage.

Fig. 5. Temperature chart of Case 29, showing pyrexia in a fatal case.

Pathology.

It has been suggested that chorea gravidarum has a different pathology to ordinary chorea of childhood. It is naturally very difficult to gainsay such a suggestion, seeing how little is

known of the pathology of either. That chorea of children is a manifestation of acute rheumatic infection is now generally believed. The same organism has been isolated both in acute rheumatism and in chorea. It is still controversial whether this diplococcus is specific. If chorea has a bacterial origin, to prove that chorea gravidarum and that of children were one and the same, it would be necessary to find the same organism in both. This has not yet been done. Cultivations were made post-mortem in two of our cases (27 and 28), but no growth resulted. This aspect of the evidence, therefore, is negative. But out of our total 29 cases, no fewer than 19 had had rheumatism or chorea, previously, and of these, 15 had had chorea before marriage. This is so large a proportion of the whole that we feel convinced that chorea gravidarum and infantile chorea have a similar pathology. Were we to give the family histories, the rheumatic nature of chorea gravidarum would come out more strongly still.

Many writers lay stress upon illicit pregnancy as a cause. Of this we are by no means convinced. Of our 29 cases, 4 only were unmarried. We do not know the proportion of illicit pregnancies in young women in the borough; but we do believe that, considering the ages and the status of our patients, the proportion of 4 out of 29 is not high enough to justify the dogma that illicit pregnancy even predisposes to chorea.

We are quite ready to admit that nervousness of disposition, anxiety, fright, and worry all tend to accentuate choreic movements, but we do not hold that they actually produce chorea. Indeed, we are not sure but that the neurotic manifestations are the result of the rheumatic toxæmia.

General Remarks.

We are in agreement with other writers on this subject, that the age of the patients is young; that primiparous women are more often affected than are multiparous; and that there is a tendency to recurrence in successive pregnancies.

In regard to age, only three of our cases were as old as 30. The majority were about 20. Eighteen out of the 29 were primiparous; five were in their second pregnancy; four in their third; and one each in the fourth and fifth.

The tendency to recurrence is distinct, as is seen in

Cases 17, 19, 21 and 23. We would point out, however, that it is possible for chorea to occur with one pregnancy, then to be absent with one pregnancy or more, and to recur at a later one. In Case 17, for example, chorea occurred with the first pregnancy, was absent in the second, third and fourth, but recurred in the fifth.

It must also be noted that it is by no means safe to say that chorea will not occur in a second or third pregnancy when it has not occurred with the first. In Case 29, for example, there was no chorea after marriage until the fourth pregnancy. In Cases 5, 9 and 22, there was no chorea till the third pregnancy. In nine of our 29 cases, the first pregnancy was free, yet chorea occurred during a later pregnancy.

Chorea may occur at any time during the carrying, but an attack is distinctly less likely to begin during the later months. We find that—

Choreic movements began—

During the 1st month, in 5 cases (one died).

„	„	2nd	„	5	„
„	„	3rd	„	4	„ (one died).
„	„	4th	„	5	„
„	„	5th	„	3	„ (one died).
„	„	6th	„	2	„
„	„	7th	„	4	„
„	„	8th	„	0	„
„	„	9th	„	0	„

In one they began before conception.

When chorea recurs in successive pregnancies, it is prone to begin at the same month each time.

Prognosis.

The mortality amongst the mothers is certainly greater than is that amongst choreic children, but we feel certain that it has been over-estimated by many writers. We believe that too much stress is usually laid upon the gravity of chorea in pregnancy. In Barnes' classical paper, the mortality was given as 43 per cent. Buist, who has collected a very large number of cases, gives the mortality as 20 per cent. We think the reason of these high figures is that they are based mainly upon cases that have been collected from many

different sources in the literature. It is natural that the milder cases escape from such statistics, because they would not seem to be of sufficient interest to be published individually. We think that cases from the same hospital, taken consecutively, afford a better basis for determining the mortality, even though the numbers dealt with are much smaller than those in some previous papers.

Even with hospital patients, it must be remembered that all the more serious cases will be admitted, whereas some of the milder ones may be seen only in the out-patient department. This would tend to render the mortality amongst our cases, who were admitted to the wards, higher than it ought to be.

Even so, we have only 3 deaths out of 29, or 10 per cent. In our last case it will be seen that there was evidence of the chorea being possibly a post-hemiplegic condition from already existing fungating endocarditis and cerebral embolism. The clinical condition was one of fungating endocarditis. If this exceptional case be excluded, the mortality is 2 in 28, or only 7 per cent.

The Importance of Pyrexia.

There is one point which we think very important, and one to which we cannot find attention drawn in the literature; and that is the significance of pyrexia in the prognosis of chorea gravidarum. As will be seen, on referring to the abstracts of cases, not a single one of the 26 patients who recovered had temperatures above 99° F. In the majority, indeed, the temperature was slightly subnormal. In all the fatal cases, on the other hand, there was marked pyrexia (*vide* charts); in one case persisting for over four weeks; in another for one week; and in both cases preceding the birth of the foetus. That the intra-uterine death of the child need not be the cause of pyrexia is shown by cases 20 and 21, where there was no pyrexia, although the foetus had been dead *in utero*, and in one case was macerated.

Our cases are too few to generalise upon, but so striking is the presence of pyrexia in our fatal cases, and its absence in those which recovered, that we consider that a rise of temperature above 100° F. in a patient suffering from chorea gravidarum

would justify a grave prognosis, if no obvious acute tonsillitis or other such cause for the pyrexia could be found. On the other hand, we should feel happy as to the immediate prognosis of the patient, so long as the temperature remained normal ; and this regardless of the severity of the choreic movements. The chorea was very severe in seven of our cases ; of these five had no pyrexia and recovered, two had pyrexia and died.

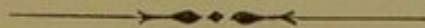
To use a comparison, one might say that "simple" chorea gravidarum is to fatal chorea gravidarum as "simple" endocarditis is to fungating endocarditis.

Treatment : The Question of Induction of Labour.

The majority of cases do well when treated in exactly the same way as non-pregnant cases of chorea. If labour is to be induced at all, our remarks above indicate that it must be done before the onset of pyrexia. It is impossible to judge by the movements alone, whether the case will end badly or well. Even of the severe cases, as we have mentioned, the greater number (5 out of 7) got well without termination of the pregnancy. Moreover, induction of labour in the bad cases is not a specific cure for the condition. We think, therefore, that it is unwise to induce labour simply because the movements are severe, and we think it too late to induce labour when pyrexia has set in. So difficult is it to decide when induction may do good, that we hold that it is seldom the line of treatment to be adopted.

In other words, the patients should be treated as though suffering from chorea without pregnancy.

We offer our best thanks to the Treasurer and to the Physicians of Guy's Hospital for their kind permission to make use of the notes of the cases embodied in this paper.



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