Notes of three cases of Periphrseal Belamhatae

with a short account of the

Causation and Treatment

By

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A short account

Puerperal eclampsia with
notes of three cases

Definition: Puerperal eclampsia is an epileptiform condition occurring during the latter months of pregnancy or during or after parturition associated usually with some abnormal condition of the urine.

It is one of the most serious conditions that the obstetrician may be called on to attend, as it usually occurs so suddenly and is so fatal both to mother and child.

The following are the notes of three cases occurring in my own practice:

1. Antepartum occurring in the same patient
2. One postpartum occurring in another patient
3. One postpartum in another patient

Case I

Mrs. B., 1st attack

On October 9th, 1895, I was called up at 2 a.m. by the husband who said that his wife was dying. I accompanied him to the house, where I found the patient lying on her back in bed, apparently quite unconscious, breathing heavily. The eyes were closed, the face pale and moist; the pulse quick; the temperature 101° F.
After a few minutes she opened her eyes and rolled them from side to side. This was soon followed by a twitching of the muscles of the face, the hands became clenched, and then a general convulsion of an exceedingly severe character set in during which the face which had previously been pale, became red and then purple and at the same time was so horribly distorted that she was almost unrecognisable. After lasting for about 3 minutes the attack gradually subsided and she regained her former comatose condition.

The history of the case so far as I could gather was as follows: She was 22 years old and previous to marriage had been very healthy, having practically never been ill before, and her parents likewise were both healthy people being farmers. At the time of her attack she was 9 months advanced in her first pregnancy having ceased menstruating on the 9th February. She had been well all the time.
of her pregnancy, never having had reason to complain except that for a day or two before the attack she had had slight headache and vertigo. She had never noticed any alteration in the urine, the bowels had been fairly regular and she herself had been in good health right up to the time of the attack. When I saw her I noticed a slight puffiness about the eyes, but there was no oedema of the legs or feet. A sample of urine could not be obtained.

At this time Labour had not commenced.

The attacks which were all severe came on about every twenty minutes and lasted for about 2 or 3 minutes. The character of the attacks were all alike, commencing by the eyes opening and then rolling from side to side, this being followed by a twitching of the facial muscles and then the general convulsion.

Treatment: I had no Chloroform with me at the time but I gave her 10 grains of chloral at the back of the tongue and 40 grains Bromide.
of Potassium by means of an enema, I also gave her a hypodermic injection of quinine and chloroform, but the fits continued with unabated frequency and power until 12 A.M. when I decided to try the effects of Venesection. About one pint of blood was removed from the right forearm, but she had another attack within 10 minutes, followed in 20 minutes by still another, both of them being of equal if not greater severity than the previous ones.

(During the convulsions a gag composed of the handle of a teaspoon wrapped round several times with flannel was inserted between the teeth in order to prevent any biting and laceration of the tongue.)

I then left her for a few hours, calling again about 10 o'clock, I found that she had had no severe paroxysm during the time that I had been absent, although there had been several slight attacks. She had perspired freely but vomited had been passed. She was unconscious.
Labour had not commenced again. I saw her at 4 P.M. the same evening. The attacks I now found to be increasing in severity although they were only slight compared with those which had occurred in the morning. I found also that they came on co-incidentally with the uterine contractions. On examination I found that labour had commenced and was progressing very satisfactorily, the cervix being completely dilated, she was still quite unconscious. As the convulsions seemed to be aggravated by the uterine contractions and as the cervix was well dilated I determined to empty the uterus by the forceps. This was comparatively easily effected. The effect of this procedure was marvellous, the fits which had for some time previously been increasing in force suddenly ceased there not being a single fit after the child was born. The child was still-born. Although the fits had ceased she was by no means out of danger. She was
unconscious. She appeared quite exhausted.

She was very pale. Palpable pulse. The
attendants were quite hopeless as to her recovery.

During all this time she had not
passed a drop of urine, and I did not pass a catheter for fear of increasing
the convulsions.

Oct 10th. The day following

She had rested fairly well during the
night. There had not been any more
convulsions, she was able to swallow
a little milk. The temperature had
fallen to 102.5°. The pulse was rather
gfull and was able to be counted
it was 144 per minute. She had
not as yet passed any urine. I
ordered her a saline diuretic mixture
to be taken every four hours.

Oct 11th. She had passed
a little urine in the afternoon of the
preceding day having been at least
16 hours from the onset of the attack,
without passing any. It was high
coloured, smoky urine but contained
only a mere trace of albumi

The temp had fallen to 100-4. The pulse was stronger being 108 per minute. She could swallow her pills rather better but there was no other sign of consciousness. The Bowels had been moved that morning Oct 12th. She was still unconscious. The temp was normal. The urine was more abundant and was not so high coloured. The Bowels had again been freely moved.

Oct 13th. During the preceding night she had spoken for the first time, as though she was in a dream. She said "Go to sleep, Jan", but nothing more. She seems to rest more naturally.

Oct 14th. On this date 6 days after the attack, she first recognised her husband and her mother, but she did not know any one else—although others about her were well known to her.

The Urine is now abundant with a slight trace of albumin. L.C. 10-28
The bowels being regular, there is no sedentary except a slight puffiness about the eyes.

OCT 21. On this date she was allowed to sit up for a short time. She had made great physical improvement but the mind seemed to be very clouded and she was exceedingly irritable. She did not seem to have the least idea what had occurred. I asked her how far advanced she was in her pregnancy but she did not know. She did not know whether she was six months or whether she was 10 months.

When asked her age she said 15 years. She complained of her food being sour and on being told that it was not sour she got very irritable and finally threw the food into her husband's face.

At this time also she complained of not being able to see, saying that it seemed as though there was a mist before her eyes.
After this with suitable diet and gentle exercise in the open air both mind and body gradually improved.

When I saw her again some two months afterwards it was scarcely noticeable externally that there had been anything wrong. The haziness over the eyes was gradually clearing away. The mental symptoms had almost vanished. The urine was quite free from albumin. It was in fair quantity.

The only medicine she took after the attacks was a saline diuretic.
Case II

On the 4th Sept 1857 nearly 2 years after Case I was asked to see the same patient again. When I arrived she was lying in bed in a semi-conscious condition. The face pale and rather swollen. There was a bloody froth about the mouth. The result of a severe laceration of the tongue. There was a slight oedema of the legs and face. The temperature was subnormal being 94.6°F. The pulse was small and quick being about 94 per minute. Labour had not commenced.

She had apparently enjoyed good health since her last attack of eclampsia and had been able to do her own household duties. She was about 4½ months pregnant. She had had 3 fits when I saw her at 6 p.m. The attacks were very much the same as they were on the previous occasion. They commenced by the respiration becoming fuller and deeper. She then opened both eyes.
Afterwards she turned the head to the right side. This was followed by turning of both eyes to the right so that scarcely anything of the eye was visible except the white sclerotic. This was immediately followed by mydriasis in both eyes (this continued during the whole of the paroxysm) and this was followed by the general convulsion. The attacks lasted between 2 or 3 minutes and recurred about every 30 minutes. Immediately after the attack the pulse was 156 per minute and was full and bounding but it gradually fell to 80 per minute and became small and compressible.

Treatment I gave her a hypodermic injection of Pilocarpin 1/86 and put a hot bottle to her feet in order to encourage free respiration and as she was able to swallow I gave her 30 grains of Chloral hydrate but as she vomited some time afterwards part of this may have come back again.
During the convulsions I gave her chloroform to inhale with the view of diminishing their force if not their frequency, but the effect was not very marked. Remembering the very beneficial effect produced in the previous case by the emptying of the uterus and as the treatment so far had been of no effect I determined to induce labour. The cervix was dilated by digital pressure of the second pregnancy terminated but in this case the good effect seen in the former case was not repeated, the fits still continued to come on as regularly and quite as severely as before. At this time the temperature had risen to 103.5 F., the pulse was 144 per minute and she was in a very poor persuasion. The paroxysms went on regularly until 4 A.M. when she had one more severe than any of the previous ones after which there was an interval of an hour or half during which there were no general convulsions although there were periodic streakings of the eyes. Hypostasms after 5 A.M. as they commenced to come on as so
before—(every 20 minutes) At 4 a.m. gave
her a hypodermic injection of 15 grain alcohol
before she did not have another attack
until 2:40 a.m. and this one proved to be
the last for although she had several
slight attacks afterwards she had no more
general convulsions.

At 2:30 a.m. the pulse was 120 per minute and
was easily compressible. The temp was 107.6°F.

She remained unconscious until the
following Monday—(about 48 hrs) when she
began to notice the people round about her
She passed no urine from the commencement
of the attack until the Monday on which day
I was able to obtain a sample of it. It was
slightly albuminous. The specific gravity 1.020
From this date the urine gradually
increased in quantity & the oedema disappeared
She made a gradual and satisfactory
recovery. The oedema symptoms although present on
occasion were not so bad and they cleared
up sooner than they did on the previous occasion.

The child was born alive and appeared
to thrive the first 2 or 3 days but it died at the end
of the week in convulsions.
Case III
Mrs. T. Prumpara aged 44 yrs.
This patient had had an attack of Scarletina about 10 yrs. previously and this had evidently been followed by an attack of nephritis although the history was not by any means precise on this point. She had been healthy ever since. She was confined at full time on the 17th May 1878, Labour was normal but she had a slight attack of Post Partum Haemorrhage about 12 hours after the birth, and while the nurse was changing her this was controlled by means of the hot douche. She progressed favourably for the first 5 or 6 days but at the end of the week the T <i>temp.</i> went up to 101 F. and the Lochial which was fairly copious became offensive. I ordered the nurse to give her a vaginal douche and gave her a saline mixture.

On the following morning, the 25th May, I was roused with a very urgent message to go and see her. When I arrived she appeared very pale & exhausted, only partly conscious. I saw her again at 10 a.m. (about 10 hours after the first attack) she had not had
any more attacks, I was just producing to give her a douche myself when she had another attack. The whole body being convulsed, the attack lasted about one minute after which she soon became conscious again. The temperature was 105° F. The urine was very scanty, only about a teaspoonful being got. It contained a great amount of albumin (about one half) and blood.

I ordered poultices over the loins and I gave her a draught of magnesium potassium bromide and soda-bicarbonate, she also had a saline diuretic mixture.

She had another attack at 8 P.M. that is at the end of 10 hours and another at 9 P.M. the following morning neither them being so severe at the previous ones.

She had no more attacks afterwards.

The urine gradually increased in quantity while the amount of albumen decreased. The temperature had fallen to normal by the end of 48 hours. She made a very good recovery.
Comparative Frequency of Puerperal Convulsions

The frequency seems to vary according to different observers. Thus Zonar (Arch. f. Gynäk., 1853) enumerates 50 cases out of 5,000 labours or 1 in 100, while Schierbner (Arch. f. Gyn., 51, p. 325) out of 42,607 labours had 137 or 1 in 311 while Spiegelberg in his textbook thinks that 1 in 500 is too high an estimate.

It occurs much more frequently in primiparae than in multiparae, probably about 4 times as often. In Schierbner's 137 cases, 109 were primiparae, while only 28 were multiparae.

It occurs along with parturition much oftener than either before or after, probably because the onset of puerperia tends to bring on labour.

Diagnosis

In the older text-books, puerperal convulsions were divided into the hysterical, the epileptic and the epileptic. But we may have any
one of these diseases occurring in the
pregnant woman quite independently
of eclampsia. These diseases are those
from which we require to diagnose eclampsia.
In Hysteria the patient is not totally
unconscious and there will have probably been
some previous manifestation of hysteria.
In Apoplexy there are the local
symptoms, e.g., one side being paralyzed
and one pupil contracted while the other is dilated.
In Epilepsy we shall probably have
the previous history of the woman, also
the temperature is not raised in the epileptic
state while it is in the eclampsia.
While in true Eclampsia we have
the scanty urine which is probably
highly albuminous. There are also
certain premonitory symptoms to be
afterwards described.
Presumptory symptoms are not always present, or if present are not very prominent. Thus, in Case I the patient had complained of nothing except slight headache on the previous day, while in Case II she did not notice anything although she was on the lookout for anything abnormal.

Headache is the most common of the presumptory symptoms often being accompanied with a feeling of indigestion or nausea. Sometimes there is a transient loss of sight or there may be spots before the eyes. There may also be oedema of hands, feet or face. There is also sometimes a severe pain in the epigastric region. These symptoms occurring in a pregnant woman should make us suspicious and should lead to an examination of the urine. If we find on examination that she is suffering from albuminuria, particular if we know that it has developed during pregnancy, immediate treatment is indicated.
The Onset is usually sudden and in its character it is the same as an ordinary epileptic fit. There is first a tonic spasm during which the face is pale; this period lasts only a very short time and is followed by a stage of clonic convulsions during which the face becomes first of a dusky red colour changing gradually to a livid purple. The eyes may be turned upwards so that the white sclerotic only is visible. The tongue may be protruded and may be bitten by the convulsive movements of the jaws. The muscles of the face become contracted so that the countenance becomes horrible and may be unrecognisable. Frothy saliva collects about the mouth and this may be bloodstained if the tongue has been bitten. The convulsions extend to all the muscles of the body. The thumbs may be turned in towards the palm of the hand which may also be spasmodically clenched. The involuntary muscles are apt to be implicated as well as
the voluntary as shown by the occasional involuntary expulsion of serum or faces, or by the temporary arrest of respiration.

During the attack the patient is totally unconscious; she is quite insensible and afterwards has no recollection of what has taken place. The attack may last from 2 to 3 minutes (Spiegelberg says never more than one minute) mostly not so long after which consciousness generally returns although she is rather dazed and has no clear conception of what has occurred.

After a longer or shorter interval there is generally a return of the convulsions characterized by the same symptoms, and they may come on with more or less force and frequency according to the severity of the attack.

The paroxysms are sometimes induced by something disturbing or irritating the woman as for example a uterin contraction.

Between the attacks she is in a semi-conscious condition, rather dazed, but the more frequent and the more numerous
The attacks, the less thoroughly does the
regain consciousness between them, this is
the probably to the cerebral congestion
caused by the spasmatic contraction of
the muscles of the neck. Compressing the
blood vessels of that region. Yet
sometimes happens that this state of
coma may deepen and the patient die
but this intense is comparatively rare.
She usually, is able to groan when the
uterine contractions occur or she may
respond when shouted at.

The number of Fits in a case varies
greatly, Friegeisen states that the severer
the first attack the more rapidly does
a fresh one follow. There may be only
one or two or there may be a large number
as many as 60 or 70 fits. Anything
irritating the woman e.g. any obstetric
interference or even uterine contraction
will to induce the paroxysm.
Liviére states that in his experience
the average number of fits treated on
The expectant plan was 5, but if treated by operation then the average rose to 11 jets per case.
In 53% of Schreibner's cases there were less than 5 jets, while the average in all his cases was 8 jets per case.
Sene's states that the greatest number of jets in a case which recovered so far as his experience went was 14 jets, while he had known as many as 80 jets in a fatal case.
In my own experience I am inclined to think that in Case I there were at least 24 jets, for although I did not count the attacks & several times timed the interval between them.
The interval between the attacks may be only a few minutes or there may be some hours. Thus in Case I the interval was regularly 20 minutes while in Case II it was from 8 to 12 hours.
Cause

It is a well known fact that during pregnancy the whole nervous system of a woman is in a state of unstable equilibrium. Approaching in this respect the nervous system of a child, she is thus more liable to suffer from any nervous excitement, she often suffers from neuralgia, mania, or melancholia, insomnia or chorea as also vomiting which is often a purely nervous symptom.

But besides this excitable nervous condition, something else is also requisite to cause these convulsions. In 1843 Lever pointed out that the attacks of eclampsia were usually accompanied by albuminuria but it was since then been conclusively proved that the two conditions are not necessarily co-existent. Thus Patay gives a list of 19 cases of albuminuria in only 4 of which eclampsia occurred. Also one case of eclampsia in which there was no albuminuria. Patay says that albuminuria occurs in 5% of all pregnancies and is more frequent in primiparas than in multiparas but that it disappears in the first few days after delivery. In cases of eclampsia where albuminuria is present the severity of the
Sclampsia is not at all proportional to the amount of albumin. Thus in Case I, which was a very severe case, Sclampsia the amount of albumin was only very slight, while in Case III, which was only a moderate case of Sclampsia there was a considerably greater amount of albumin.

Until quite recently two theories of the causation of the convulsions held the field, the first of these, the chemical theory, explained the convulsions as being due to the area which ought to be excreted by the kidney being retained in the blood and acted as a poison to the nervous system. This theory was afterwards modified by Purkiss who held that this area was decomposed into carbonates of ammonia and water and that this ammonia was the active poison. But it is only very rarely that ammonia can be detected in the blood and then only in very small quantities. It was afterwards suggested that there was some other substance such as creatinin or kreatinin which had failed to be excreted and that this acted as a poison.

This theory gradually fell into disrepute and the opposing theory held by Traube and
Rosenstein's view was gradually accepted. This theory is shortly as follows. In a normal concomitant of pregnancy, there is an hydramia condition of the blood. If albuminuria is present, this condition is intensified. II. There is a rise of blood pressure during pregnancy due to a normal hypertrophy of the heart. IV. The result of these combined states is a hyperaemia of the brain which is followed by a serious effusion into the cerebral tissues, this presses on the minute vessels of the brain causing cerebral anaemia and so convulsions.

In reference to this theory, Spiegelberg states that it fails to explain why eclampsia is so rare while the pathological conditions supposed are present in a great number of cases. Moreover he states that this hydramia is not present in most eclamptics. Oedema is not by any means constant in the cases of eclamptic women. Also the clinical signs of cerebral pressure due to oedema are absent.
Bouchard later still brought forward a theory which he calls the Auto-intoxication Theory. It is shortly as follows:

The metamorphosis constantly taking place in the body results in the formation of certain things that are excreted by the kidneys and that these substances are poisonous even in normal healthy urine. That during pregnancy these poisons are increased. That the pregnant woman is more susceptible to these poisons. That under certain unknown conditions the excretory organs fail to excrete these poisons and that they then increase in the blood and eclampsia results.

Dr. Clifford Allbutt in an article in The Lancet of Feb. 24th, 1898, compares certain symptoms occurring in pregnancy to similar ones occurring in infectious disease. He points to the vomiting of pregnancy and likens it to the same occurring at the commencement of scarletina. The same with the enlargement of the heart, the increased arterial pressure, also the albuminuria in both cases.
He then asks the question: What is the first vomiting, then nervous disturbance, then albuminuria, then enlargement of the heart, what would be the conclusion of the case? Surely that there is some toxin circulating in the body. Why then, in pregnancy should we fail to consider the conclusion which is drawn so readily and so correctly in cases where the presence of a poison is better known? It is because we are possessed by the prejudice that pregnancy is a normal process, but then our bodies are constantly dying and the products of such death are poisonous, we are only saved from poisoning by the unceasing activity of our excretory organs. Now is there any evidence tending to prove that during pregnancy there is any such poison circulating in the blood which may set up vomiting, albuminuria? eclampsia? There is some evidence that tends to support this view. Bouchard states that 45 grammes of healthy human urine with 1 kilogramme of rabbit when
injected into them, he also states that this toxicity of the urine was increased in cases of eclampsia but at the same time the toxicity of the blood serum was increased.

Rumors of Lienna showed that whereas it required 10 c.c. of blood serum from a healthy person to cause death when injected into a rabbit, it only required 2.3 or 4 c.c. of blood serum derived from an eclamptic woman. Chamberlain, working independently, arrived at similar conclusions, and he suggests that the toxicity of the blood serum can be ascertained may enable one to arrive at a prognosis. He states the case of an eclamptic woman who seemed likely to recover but the toxicity of whose blood was found to be very great and the patient of the case was confirmed by her death.

Certain experiments of Van De Velde tend to support this theory. He compares the case with which the injection of human urine induces convulsions in rabbits finding that 4 c.c. per kilogram
of bodyweight is sufficient in pregnant rabbits, whereas it requires 20 c.c. in non-pregnant rabbits. In only one out of 34 animals was there any difficulty in inducing convulsions. The causes of this increased increased susceptibility he thinks to be in the presence of a greater proportion of the toxins producing convulsions in the blood of the pregnant rabbit as a greater vulnerability of their nerve centres to these toxins.

He also finds that 18 c.c. of blood (per kilogram serum from a gravid animal induces convulsions when injected into a rabbit, while it requires 25 c.c. from a non-pregnant animal to induce the convulsion. If urine be substituted for blood serum, the figures are 18 c.c. vs 25 c.c. per kilogram. From these experiments Van de Velde concludes that pregnancy leads to the formation in the female organism of substances whose principle action is the causation of convulsions that these substances are normally eliminated by the urine and that they circulate in the blood to a greater extent.
in pregnant than in normal animals thus indicating an excess of production or excretion in the pregnant animals. She also thinks that there is an increased susceptibility of the nerve centers during pregnancy because for some days after delivery the animal is more easily convulsed by the injection of blood or urine than the normal although its own urine is no longer abnormally toxic, he finally accepts Bouchard's views as to the cause of eclampsia being auto-intoxication by the accumulation in the blood of the toxins of pregnancy.

The question now arises what is this poison and where is it formed? Dr. Allbutt admits that it has not been isolated and that as yet it is indicated by negatives: it is not urea, it is not uric acid, it is not creatinin, it is not potassium chloride and he goes on to state that it is a toxin which is absorbed from the bowel. He states that "fatigue products form part of it" as on a day after great exertion the urine is more "toxic". The toxin may be
absorbed direct from the bowel but the
means of our impunity is the liver which
neutralizes the toxins which find their
way into the circulation... If then for
any reason this protective function of the
liver be checked or a larger quantity of
toxin be turned into the blood than
the liver can deal with, the excess will
fall directly on the kidney and probably
will so injure its finer structure that
albumin can leak through... When
there is a retention of these toxic bodies
in the system.

I agree to a great extent with this
theory but I do not see sufficient evidence
to point to any particular poison and
as would rather leave it as being due to
retention in the blood of some unknown
constituent or constituents of the urine.
This may be quite consistent with the
fact that passing a large quantity of urine
but in such cases it is found to be
of low specific gravity and it is not so
toxic to rabbits as it normally would be.
but in many cases as in Case 5 we find that
there is almost if not quite suppressive vermin.
Cohnheim in his Pathology attributes
the convulsions to the retention in the
blood of the urinary constituents, this,
in its turn being due to a spasmod of the
renal arteries, while Spiegelberg goes
still farther back and attributes this
symptom to a reflex irritation from the
arteries.

Why does eclampsia occur so much
more frequently in Primiparae than in
Multiparae? We have the patient in a
more susceptible condition. She is more prone to
think about her condition; it is something
strange to her. Clifford Allbutt advances
the theory of immunity, due to previous
preparations to account for this. He thinks
that if a woman has successfully gone
through one pregnancy she will have
become so habituated to the toxins
formed during pregnancy (or the increase in
the blood of the urinary constituents) that she
is practically immune from their effects.
He states that the blood serum Viscera are as
hypertonic in multiparae as in Primiparae.
Termination of the attacks, Fiegelberg says that it very rarely ends in recovery except after delivery. The oedema and albuminuria disappear very rapidly. She is very prone to suffer from severe haemorrhage after delivery. This is probably due to the accompanying albuminuria. She is also more liable to other purpuric diseases such as purpura fever due no doubt to the operative measures or often undertaken. She may have as sequelae various nervous disorders a puerperal condition or mania. In Case I it appeared for some weeks possible to have been probable that she would degenerate into melancholia.

Occasionally the patient may die at the time of the attack; this may be due to asphyxia from the long continuance of the spasm or it may be from the combined effects of the exhaustion induced together with the asphyxia. It may be due to cerebral asphyxia or to the so-called oedema of the lungs. This oedema may be due to the disease or to the phenacrin given in the course of treatment or as D. Tweedy suggests it may be partly
due to fluids that have reached the lungs from the mouth, it is for this reason that he condemns the dorsal position and he says also that the gag is painful in harm for this act of swallowing cannot be accomplished with the teeth wide apart.

_Proposia_ as to the matter

It depends greatly on the number & severity of the attacks as besides the danger of dying in each attack the exhaustion becomes greater with every succeeding fit. The more complete the anuria the more serious the case.

Chambertin suggests that the toxicity of the blood when ascertained may enable one to arrive at a prognosis. He relates the case of an Englishwoman who seemed likely to recover but the toxicity of whose blood was found to be very great and the real gravity of the case was confirmed by her death. But of course it is not always an easy matter or convenient to test the toxicity of a patient's blood particularly in so sudden and serious an emergency.
The amount of albumin in the urine is not by any means a good sign of the gravity of a case, thus in Case 30, the albumin was very plentiful but she was not by any means so serious as Case 1 where there was only a very slight trace of it. Chambliss relates the case of a woman who recovered although there were 10 grammes of albumin in the litre of her urine but the toxicity of her blood was not much increased and a favourable opinion had been given.

The earlier in pregnancy the case occurs, the more serious it is. Thus those occurring before labour are more serious than those occurring during labour. Those more serious than those occurring during the puerperium. Among Schirren's 23 cases occurring antepartum, 4 died or 30.4% of 95 during labour 16 or 17.9% died; 9 of 29 during puerperium 4 or 13.8% died.

When it does occur in multiparae, it is said to be more serious than in primiparae.

Diseases of the respiratory or circulatory organs naturally affect the prognosis. Prognosis depends also on treatment. The mortality is less now than indiscriminate
Bleeding has been abandoned, while Chloroform
Toilet Sedating have been more used.

The Prognosis as regards the kidneys
is good. It is only very rarely that any
permanent renal disease is left as a result
unless it existed previous to the attacks.

The Prognosis as regards the
child is serious about one half of them dying.
In the case of 55 children recorded by Lyon,
168 were stillborn while 13 died in
the course of a few days. While out of 165 children
in Schreibers cases 34 were stillborn 75 died
soon afterwards. Spiegelberg says
that "the cause of the high mortality (infantile)
lies less in the toxicemic condition which
produces the disease than in the accumulation
of Carbonic acid in the maternal blood, caused
by the attacks, as a result of which the aeration
of the portal blood is prevented. The fetuses then
die from asphyxia and its effects, as is shown
by the post-mortem appearance. The prognosis
for the child therefore bears a direct relation to
the number and severity of the attacks. But I must
hardly add that the mode of delivery has a big
and means unimportant influence."
Treatment may be divided into **Prophylactic** and **The Treatment of the Attack**.

**Prophylactic Treatment.** At the International Congregational Gynecology held at Geneva in 1884, Carpenter said that the urine of every pregnant woman ought to be examined, and that if the least trace of albumin was found she should be put on to a strictly milk diet and that this must be continued till after labour and until the urine is free from albumin; Or, in the other hand, if there is edema without albuminuria a milk diet is indicated.

But as Dr. John Williams points out, the onset of albuminuria may be very sudden and we cannot always be examining the urine of pregnant women; still if there is reason to suspect the presence of albuminuria, or the onset of edema as by the presence of amniosedema, edema, headache or any other premonitory symptom it is our duty to examine the urine for albumin and if found to treat her gently, but we
Must remember that we may have eclampsia without albuminuria as well as albuminuria without eclampsia.

In reference to the milk treatment Terre (L'Obstetrique 1864-1876) says that the milk treatment is most efficient from a prophylactic point of view, though it does not necessarily cause the other alarming symptoms. Camille, he has never seen pits in a patient subjected to a week to milk diet, nor any other trouble of a toxic origin although it may not lessen the sediment albuminuria. In these cases when an exclusively milk diet is badly borne we must try some other method of feeding, we may allow a few vegetables, arrowroot, tapioca, rice, fish or a little white meat.

In addition to the milk diet we must have the patient confined to bed and try to reduce the vascular tension by diuretics such as the Citrate or Acetably Potash Digitalis etc. We must also keep the bowels active and clean as by calomel and jalap and intestinal antiseptics as Salicylate of Bismuth, Salol or Bergamott with occasional mercurials.
May also be encouraged as by the Turkish
of Vapour bath. Nitocarpin has also been
given for this purpose but it has been
found to be a dangerous remedy.
Dry cupping over the loins has also been
used with advantage in order to lessen
the renal hyperaemia.
If after this treatment the patient does not
improve, but the quantity of albumin continues
to increase and the general condition
of the patient gets worse, the question
arises: Are we to induce labour? This
is a question of great difficulty. Some
practitioners are in favour of the procedure
while others are against it. Zimmerman
says that it does not increase the risk
of eclampsia and may avert it altogether.
I think that the general opinion is
that if the child has reached a viable age
and the risk to the mother's life is great
or the chance of permanent injury to the
kidneys of the mother are great, then the
operation is justifiable.
If the child is dead in utero, then
of course the sooner it is away the better.
The Treatment of the Convulsions

When we come to the treatment of the attack itself, we find that there are 2 schools of Teachers, 1 The German school represented by Halbertsma Zwiefel Dikrsen etc. who teach that the first and practically the only duty of the attendant is to empty the uterus as soon as possible.

To The School represented by Charpentier in France and the majority of Obstetricians in this country who teach and practice a more conservative line of treatment.

We will now glance at the treatment advocated by one or two members of these schools and so get an outline of the treatment of this condition

Zwiefel of Leipzig in the Centralbl.f.Gyna. 1846, 1848. Advises the immediate delivery by operation in every case of eclampsia first of all by dilatation by elastic bags. Then the cervix is partly dilated making slight incisions into the Os or he may make much more extensive incisions into the cervix. He makes the incisions between 2 Billettes
Clamps so that the cervix is firmly fixed and he is able to cut deeper to control the haemorrhage better. He admits having had at least 10 cases of severe haemorrhage although he never incised the vagina nor perineum (this is advocated by Dükken) in three of these vessels had to be afterwards secured. It is on this account that Zweigl does not advise Venesection which he admits to be a useful procedure. He admits that the operation is dangerous and does not recommend it for private practice.

In his statistics he states that despite the anaesthesia the interference increased the number of fits where being an average of 5 fits in those cases treated on the expectant plan while in those treated by operation there was an average of 10 or 11 fits.

Halbertson in the Wien med. Wochenbl. Oct 1886 considers that cases of eclampsia occurring in the last 3 or 4 months of pregnancy or at the beginning of labour indicate
More radical treatment than is commonly employed, he thinks, that active interference is requisite in every case if the pregnancy has lasted 8 months and in all other cases in which 2 doses of morphine have proved inefficacious. In such cases, he says, the prognosis is much worse if the patient is left alone than if caesarian section is performed.

The same author in an article in "Nederlandsch Tijdschrift van Verlokh en Gynaz" analyzes 49 cases in order to show the advantage of operation, of these 18 occurred during labour and 31 during pregnancy.

Of those 31 cases occurring during pregnancy 4 occurred before the 5th month all the mothers were saved, but only one child was saved, this one being operated on by Dubrassen method (plicating CT). 5 cases he describes as light

1 - - - as Moderately severe

1 - - - peculiar pneumonia and cyanosis during having set in.

14 cases he describes as severe, of these 2 rejected owing to uncertainty about treatment

If neither caesarian section nor incision
of the 12 undertaken and all died
In 12 cases either one or other of these operations
was performed and only 2 died by
them being saved.
Of 18 cases occurring along with labour
by them are described as light
12 — as severe of these
9 died none of them undergoing Caesarian
section for incision of Os
2 incising cervix performed; both lived.
1 Chloroform and morphine was given
and when the os was dilated completely
the forces were applied; she recovered.
Halbertson concludes by advising
operative measures in these cases & states
that the continuous of the juts will
be more deadly to mother and child than
Caesarian section would be.

On the other hand Dr. Hastings Tweedy
in a paper reported in the Dublin Medical
Journal for March 1896 states that no
greater danger could happen to an
 eclampsic than the onset of labour, particularly if it were induced artificially. He inclines to the opinion that the fits are caused by the presence of some poisonous material in the nervous centres. He believes that it is quite possible to quickly remove this substance from the centres of danger by deflecting the blood from water and so cause a current to flow away from the nervous centres. This may be done by purging, sweating or bloodletting, but he relies mainly on the kidneys to get rid of this harmful substance. The administration of fluids in any form would in his opinion completely counteract any good effects which might follow this line of treatment. She was on no account to be allowed to lie on her back for the so-called oedema of the lungs often seen in cases which ended fatally had its origin in most instances to the drowning of the organs by fluids from the mouth.
Of all drugs Morphia given hypodermically in large doses (up to 25 grm in 24 hours) presents the greatest number advantages with the fewest disadvantages in the treatment of eclampsia. Chloroform, Chloral & Secobarbital all tend to kill in a similar manner to the eclamptic poison and therefore ought not to be employed. Neither should any fluid be placed in the mouth of the patient in unconsciousness.

Charpentier at the International Congress of Gynaecology held at Geneva said that when the patient was wedged with eclampsia and labour appeared spontaneously all were agreed that the right treatment was to terminate labour as soon as possible, but when eclampsia set in before labour a distinction must be made between cases at or nearly at full term, and those 
earlier in pregnancy, she is convinced that induction of labour is useless and forced delivery dangerous. She concludes that the urine of every pregnant woman should be examined.

II. If the least trace of albumen be found, she must be put on a strict milk diet, and this must be continued till after labour and till no albumen is present. When edema is present with milk diet is indicated although there is no albuminuria.

IV. When eclampsia occurs with cæsarian, in a strong woman bleeding up to half a litre should be performed.

VI. Chloral should be given.

VIII. When convulsions have set in, milk should be given by the mouth, this alone sometimes causes cessation of the fits. Besides this, the fits must be treated with chloroform, and clonic is induced by subcutaneous injection of saline solution. One must then wait till normal labour sets in. If there is inertia uteri, labour must be terminated.
by forceps or version. And he concludes by stating that induced labour is only exceptionally necessary and forced delivery never.

Obstetric Treatment. From the foregoing extracts we see that there is very great diversity in the obstetric treatment of this condition, ranging from men like Lister who advocate delivery in every case to men like Lees who say that no greater danger could happen than the normal labour. On theoretical grounds the use of induction of labour would appear to be advisable. It is nature's own remedy to which she resists in a great number of cases, and also after the birth of the child, Chamberlen states the toxaemia of the urine falls almost at once even in cases of normal labour. I have no doubt that in many cases it is a very useful procedure and it is well to have it in mind when the mother's life is in danger and where we are unable to control the fits in any other way. But still this is not a method of treatment to enter upon rashly, for we know that the longer
A child remains in utero the better chance it has to survive, besides which the birth of the child is not always followed by the cessation of the fits. Thus in my first case the fits were as bad after as before the birth of the child, and we must also remember that any interference, any irritation to a woman suffering from delirium tremens causes or tends to cause an increase in the number of fits. Then again if we would wish to induce labour we cannot in private practice follow out the method practiced by Lewin Findley and others of incision of the os uteri and other allied measures, Lewin himself admits that the operation is not without danger and does not recommend it for private practice.

But if labour has commenced & the cervix is fully dilated, it may be advisable to terminate the labour as soon as possible either by turning or by forceps. The good effect of this was well illustrated in my first case. The fits were gradually increasing in frequency and in force, when I terminated the
Pregnancy after which she did not have another fit. In cases where labour has commenced but is only proceeding slowly the effect of cocaine applied to the Os might be tried as it would not irritate the woman while it would have a beneficial effect in relaxing the tissues. Dr Playfair in his textbook says that forcible dilatation of the Os is strongly contra-indicated. He also states that we should adopt that course which seems least likely to prove a source of irritation to the mother, thus if the fits seem evidently induced and kept up by the pressure of the foetus and the head be within reach the forceps may be resorted to. On the other hand there be reason to think that the operation necessary to complete delivery is likely to arise from a greater source of irritation than leaving the case to nature. Then we should not interfere.

Venection. In the early and middle part of this century venection was used in nearly all cases of belampia as in
Nearly all other diseases, and with the
reduction of feeling which set in against
Venection it has been neglected in many
cases where it might have been useful,
and in properly selected cases of eclampsia
it seems by almost universal consent to
be useful. In the old days when
it was used so indiscriminately it was
no doubt responsible for the loss of many
lives, at any rate. The mortality from the
disease has been much less since it was
to a great extent discontinued.

Almost the only argument against its
use is that we do not know how much
blood the woman will subsequently lose
in the parturient process and so we may
weaken the woman too much by performing
Venection previously; this argument is
of course not available in post partum cases.

Spiegelberg places Venection first
in the treatment of this condition. He says

There is no other way of so rapidly and certainly
lowering arterial pressure, nor has such
power of restoring to the kidney their
functional activity; few have such a
relative influence on the irritated vascular motor nerves. Carpenter recommends it to be performed in the case of cyanotic strong women to the extent of 1/4 of the but personally I think that the quantity ought to be regulated by its effect on the patient.

The temporary good effect of perfusion is well illustrated by a case recorded in the Practitioner by Dr. John Williams. A patient had twice previously had eclampsia associated with albuminuria. During the 3rd pregnancy very great attention was paid to the state of the urine. It was examined night and morning from the 3rd month. No albumin appeared till the end of the 4th month, a trace then appeared and almost immediately it increased to 1/2 associated with the symptoms preceding eclampsia. She was then bled with the effect of obtaining complete relief. The albumin disappeared completely from the urine within 24 hours and remained almost entirely absent for 8 days. Then the old symptoms returned together with albumin in the urine. She was bled again with
equal relief to the suffering and almost as good an effect on the urine as the improvement lasted for a week again then the old symptoms returned. She was bled again with relief but the relief was not so complete nor so lasting as on former occasions for the albumin was not reduced to less than 40 and the distress of the face, the pain and breathlessness returned in the course of 4 days. She was bled once again with relief which lasted only 24 hours then labour was induced.

In my first case I think that Venection was decided although not immediate benefit as although she had 2 fits afterwards that were quite equal in severity to the fits that she had had before there was then practically a cessation of fits for some hours and they never afterwards became as severe as they had previously been.

Venection may be used in Post Partum cases if it is necessary without the same fear as to any future loss but still in these cases we should only use it when she is a strong full blooded woman with full pulse.
Sedatives

Chloroform, Chloral & Potassium Bromide. These are almost universally employed although some few observers do not consider them safe. Thus Twyford is opposed to their use as they are cardiotonic depressants and kill in the same manner as the strychnic poison.

It is well known that all convulsive attacks tend to recur if left to themselves and that the tendency increases with each recurrence of the attack. How the effect of the Chloroform is to reduce the excitability of the brain and cord and so counteract this tendency besides lowering the blood pressure but the effect of the Chloroform is not lasting it ceases soon after the administration if you cannot get them under rapidly enough on the approach of the convulsion so that it is advisable to give something which shall have a more permanent effect and for this purpose Chloral or Bromide both are very often given, by this means less chloroform is required to get her under when the attack recurs. If she is conscious the Chloral or Bromide may be
given by the mouth but unconscious it may be given either percutaneously or hypodermically. Chloral seems to be much more active when given hypodermically than when taken by the mouth. In my 2nd case it appeared to be very efficacious as previously to giving it hypodermically I had given it by the mouth, had used chloroform and induced labour all apparently without effect and yet after 2 doses hypodermically the fits entirely ceased nor did they ever return.

Morphia is highly recommended by Dr. Eady who advises the hypodermic injection of % followed if necessary in 12 hours by 1/4 gr. and so on until the symptoms are alleviated or until 2 grains have been given in 24 hours. In his opinion the drug seems to have little effect on the heart or kidneys. However they have so great an inhibitory effect on the sweat glands that it is a nervous sedative and diminishes salivary and bronchial secretions and by these actions counteracts those conditions which tend to kill in cholera.
Personally, knowing the great power of morphin in suppressing the secretion of urine in certain conditions, I should be rather wary about using it in eclampsia, holding as I do, the view that the eclampsia itself is due to the retention in the blood of the urinary constituents.

Diaphoresis may be useful, but it is not at all times easy to induce nor very certain in its good effects. It may be obtained in various ways as by the use of hot baths, wet packs, or by the administration of pilocarpin. I used this drug in both Case I and Case II, but although there was press perspiration, particularly in Case II, I could not detect any good effect it had. At the present time opinion seems to be against this drug. Thus Torchett says that no more potent drug could be found. It depresses the heart, promotes pre-natal retention and bronchial secretion, and oedema of the limbs. During discussion at the London Obstetrical Society, Dr. John Philips spoke of 39 cases in which pilocarpin had been used in 99, in which dangerous symptoms followed shortly after the
exhibition of the drug and I died. Post mortem appearance showed that rapid oedema the lungs took place.

Rectal Irrigation has occasionally been used. It is said with a good effect. It is said to have a diuretic action. It may possibly be done by clearing out the lower bowel, and so according to Allbutt stop the absoptive toxins but Lam inelastic to the opinion that it ought not to distract one's attention from more important means of cure.

Subcutaneous Injections of Saline solutions. This also acts as a diuretic and is recommended by Charpentier.

An interesting case is recorded by Sole (La Presse Medicaux Belge Jan 24, 1877) of a woman who when pregnant was attacked with delirium she was delivered artificially but 2 days afterwards the coma persisted and the general condition was deteriorating. Normal saline solution was injected into the subcutaneous tissue of the axilla on both sides this was
immediately followed by increased secretion of urine, the injections were repeated every 4 hours in different parts of the body. In 24 hours she was much improved and she eventually recovered.

Other diuretics may be given afterwards or between the convulsions if the patient is able to swallow such as Digitalis & Alkalis, but they are more suitable afterwards than during the convulsions.

Perspicues — The bowels must be kept open as by Colomel & Salap or by Croton oil. This helps to lower the arterial tension and helps the kidney to act better.

Various other drugs have been used for the purpose of lowering the arterial tension with more or less success. Veratrum Viride has been much praised by some practitioners particularly in America but it is said to be too depressing for the heart & therefore dangerous.
is pushed to the point of controlling the fits.

Nitrite of Amyl has also been used for the purpose of overcoming the reflex excitability of the spinal cord.

The gag must be used during the convulsion to prevent her from biting her tongue. (The handling of a gauze croqged round with flannel is a very efficient gag.) But it must not be used except during the fit as she is unable to swallow any saliva unless the teeth, lips are in contact with each other.

In conclusion, Although I have been successful in all my cases so far as the mother was concerned I do not think that I should adopt exactly the same line of treatment in any future case. For example, in both Case 1 & Case 2 I used Pilocarpin hypodermically but I do not think that much good resulted and my subsequent reading teaches me that it is often dangerous.

Many future cases (although each case
must be treated according to its own merits.
I should probably go on the following line.
I should first give a large dose of chloral hydrate either by the mouth or hypodermically.
And I should give chloroform to inhale just as soon as I could discern any signs of the fit coming on. If after this the fit showed no signs of abating I should consider the advisability of Veneesection.
While if labour was at the same time progressing I might apply a solution of cocaine to the cervix so that it might dilate more rapidly, and when fully dilated I should consider whether to terminate labour by turning, by forceps or to leave it alone.
I should also administer calomel and jalap or castor oil as a purge.
The normal saline solution might also be injected subcutaneously as an auxiliary in the treatment.
If she was not in labour
I should not do anything to induce it
(particularly if the child had not reached
a viable age) unless I considered...
that the mother's life was in serious danger or that the child was dead in utero but should keep her in bed on milk diet give chloral for sedatives and do Venesection.

The following is a list of the authorities quoted in the foregoing essay:

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Hereby declare that the foregoing
thesis has been composed and
written entirely by myself.

Sign. Dr. Matthews

Holmjiatt
April 28th 1894