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THE PROTEAN INFLUENCE OF PREGNANCY ON
IDIOPATHIC EPILEPSY.*

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The search for accurate clinical records of epilepsy in its relation to and modification by pregnancy and the puerperal state, with the remote effects of childbearing upon the mother's psychosis, is a difficult matter. For various reasons, especially the desire for maternity, the epileptic mother withholds imparting her true condition, and the severity, nature and frequency of her attacks. So likewise do the parents and relatives of the patient, and when a child is born, it too will they stealthily shield from any existing stigmata, as a mental enfeeblement born of its allied progenitor. I have had occasion to note this in another place.†

Similar obstacles are again encountered when an endeavor is made to trace the cause of the epilepsy and from this inexact knowledge many cases are still classed as idiopathic epilepsy, which, therefore, remains legitimate yet, perhaps, inexpedient scientific nomenclature, but we are not justified in changing the name idiopathic until a cause is found.

Pregnancy may, it seems, ultimately produce epilepsy; *first*, by causing puerperal convulsions, and *second*, by irritation or exhaustion. In many cases, when a frank history is obtained, the

etiologic factor is still not at all clear and we have to fall back upon the neurotic heredity and temperament, and these must only imply irritable neurons. In trauma, the specific infections and reflex irritations the cause is often detected. Conscientious fright appeared in one of my cases as a cause of epilepsy. Withal, many doubtful cases exist (the majority) which from lack of knowledge must be called essential. I propose to deal with these cases alone.

As to the explanation of the attack, whatever the cause, in contradiction of Golgi's theory of anastomosis of neurons as Leyden jars, we propose the theory of the motility of the neurons, or the discharge-theory suggested by Bechterew‡, Forel, His, and Cajal, abroad, and by Dercum§ in this country, which can be applied with nice precision to the motor explosions occurring in this most singular disease; for such irregular contractions of the protoplasmic mass may separate the dendrites to such an extent as to cause great incoordination of molecular force ordinarily held in abeyance by their normal coaptation. It seems just to infer that the cell-degenerations that sooner or later occur in cases of idiopathic epilepsy, follow the bad habit of the cell referred to, and, of course, its nutrition being interfered with, structural change must follow. As yet no

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† Transactions American Academy of Medicine, 1895.

‡ Neurolog. Centralbl., 1896, Nos. 2 and 3, "Doctrine of the Neurons and the Discharge-Theory."

§ Functions of the Neuron. *Journal of Nervous and Mental Disease*, August, 1896.

accurate dividing line can be determined between the functional perversion and the organic cases, although in this disease, as in all affections, the pathologic histologist is placing morbid states one by one in the latter category.

The literature of the effect of pregnancy on epilepsy is meager. In Hare's "Essay on Epilepsy," the subject is traced down to 1889. This author says: "The influence of pregnancy on epilepsy is another point of interest and dispute, some claiming that the fits are increased, while others say they are diminished in frequency." During *labor* a fit is extremely rare in the epileptic. Tyler Smith,|| has seen only two attacks occur in fifty-three deliveries of fifteen epileptic women. The converse of this is also exceptional, but I know of one case in which the babe was born in convulsion.

Several unusual cases coming under my personal observation relative to the subject under consideration, presenting different phases of pregnancy and epilepsy, form the nucleus of this study, inasmuch as the anamnesis is complete and the progress of the cases has been traced up to date.

CASE I.—Mrs. J. J. G., twenty-three years old, was seen with Dr. W. E. Hall, of Burlington, N. J., in September, 1896. There is no trace whatever of epilepsy or other neurotic disease in the ancestry. Without known cause and while in otherwise perfect health attacks of *petit mal* began at thirteen years of age. They came at irregular times, were very slight and momentary. Anything she was holding at the time would drop from her hand. She never fell, but simply stopped at whatever she was doing, and went on directly afterward. There was no aura. Menstruation was established at fourteen years, normally, and had no influence whatever on the spells. The patient was married about a year ago (at the age of twenty-two), concealing her trouble from her husband. The attacks went on "the same, or now even more frequently." She promptly became pregnant and the attacks continued irregularly once or twice a month the same as

before marriage. An apparently healthy, even robust, girl, weighing five pounds, was born at the end of nine months. Labor was normal. The mother is a small woman and now presents the typical epileptic facies. No other disease can be found. She says her milk came very freely for the babe and that she at once became greatly "run down." At the third month of her puerperium she had her first and violent attack of *grand mal*. This was three months ago, September 27, 1896. Similar attacks have recurred once in from ten days to two weeks in spite of weaning the child, and of a tonic line of treatment during four months up to the last time I heard of her, November 19, 1896. The child is apparently normal.

This case of idiopathic epilepsy then developed *petit mal* at thirteen years of age. The patient was married nine years later. The attacks increased in frequency during pregnancy; a healthy (?) child was born, which was nursed thirteen months. The mother then being run down developed *grand mal*, which has become more manifest slowly up to the present time.

The following two cases occurred in the service of Dr. Alfred Stengel, at the Howard Hospital, where I had the opportunity of studying them:

CASE II.—Mrs. M. C., white, forty-two years old, was admitted to the ward September 4, 1896, suffering from chronic mucous entero-colitis and grave secondary anemia. Here, too, there is a negative neurotic history. The father had died of rheumatism; and this disease at fifteen years of age, and scarlet fever later were the only serious ailments the woman had suffered from. Nine months after the birth of her second child, at twenty-three years of age, and being much run down, she was seized while asleep with an "epileptic fit," and had several attacks that week. She, therefore, weaned the child. The attacks were preceded momentarily by an aura consisting of a peculiar feeling in both her thumbs. She bit her tongue in most of the attacks, which were characterized by general clonic convulsions, followed by tonic spasm. She knew nothing for some minutes after the aura;

|| *Lancet*. XXIV., p. 644, 1849.

and was somnolent an hour or two after a fit. From no apparent cause three years ago, in her thirty-ninth year, the attacks which had occurred from every four to six weeks, gradually lessened in frequency, and during that year finally ceased *absolutely*. The patient had had a third child two and a half years after the birth of the second. There was no lessening effect on the mother's attacks during this pregnancy. She has had no other children. The third child she affirms to have been normal. It died of diphtheria at six years of age.

The anemia lessened *pari passu* with the cure of the enteritis, the blood-count going up from 1,600,000 red blood-corpuscles and 16 per cent. of hemoglobin to 2,400,000 corpuscles and 30 per cent. of hemoglobin during the five weeks she remained in the hospital.

In this case it seems probable that the debilitated condition of the patient consequent upon child-bearing was the predisposing factor for the development of epilepsy. The attacks were severe, lasted sixteen years, then finally stopped, and during that time a third pregnancy did not influence materially the fits. The free interval of three years, however, is not positive evidence that the attacks will not return later, although her recent severe anemia, it would seem, might have brought them on if the epileptic state was still latent.

CASE III.—H. B., a colored woman aged twenty-four years, gave a negative family history. She had always been "nervous" and had a bad temper. Two years before I saw her (in August, 1895, when she was pregnant four months with her second child), the patient says she had her first convulsion. This followed six weeks after the death (from marasmus) of her first child at the age of nine months. The mother's vitality had been reduced in caring for, and nursing, the infant. She gave a history of having had irregular attacks of *petit mal* several years before, not related to the menstrual epoch, but somewhat increased in frequency after her marriage. Still later, during her first pregnancy, the spells became less frequent, and she had no attacks of *petit mal* during gestation until the sixth month. They con-

tinued after this every five or six weeks until the development of the major attack as noted, in which she was unconscious, bit her tongue on both sides and remained stupid for some hours afterward. The major attacks had recurred then pretty regularly every four or five weeks up to and including this second impregnation. Urinary examination was negative. Other organs were healthy.

This woman was delivered on January 29, 1896, at term, of an apparently healthy child, which, aside from a persistent facial eczema, is in good condition and nursing from its mother. Since delivery the patient has had attacks of *grand mal* on March 25th and 26th, a slighter attack on April 6th; again very severe attacks on July 9th and 20th, August 20th and 28th. She then skipped September and October to November 23d, when she had a violent explosion, the premonitory symptom of which was frontal headache from 6 to 11 A. M. Ringing in the ears while making a bed was the only aura. She screamed and remembered lying down in bed, under which she was found in an unconscious condition a few seconds later. She still persists in nursing her baby at the tenth month. The latter has not cut any teeth.

This case of *idiopathic petit mal*, beginning at about seventeen years of age, was made worse (or was it a coincidence) after marriage at twenty. The spells stopped entirely during the first six months of her first pregnancy, again increased, and finally at the tenth month after labor she developed *grand mal*; which continued on and through a second gestation without notable amelioration.

These three cases illustrate varied modifications of the epileptic state by pregnancy. In order to more definitely investigate the subject I have made further inquiry with the following result:

Dr. Barton Cooke Hirst has sent me notes of the following three cases in his practice:

CASES IV. AND V.—"The two patients of mine who had epilepsy before confinement did not give a very distinctive

history afterward. In one, who had usually but a single attack a year, there has been no return whatever of the trouble, since her confinement some eighteen months ago. The other case in which there had been no attack for a good many months prior to pregnancy, broke out again quite badly in two successive convulsions, the first when her baby was about three or four months old; but under careful treatment since, including bromid, there has been a period of about three or four months free from convulsions."

CASE VI.—"In looking over my notes I find that I have still another case of epilepsy in pregnancy. This woman had her first attack between twelve and thirteen before puberty was established. Following the first period the fits recurred always just before or just after the menstrual flow, but not every month, from six to nine during the year. If the convulsions, however, did not occur, choreic movements of a violent character regularly appeared during this period. This was her history until she married and became pregnant. During pregnancy there was a convulsion in the first and third months. There was not another convulsion during the next fifteen months, that is, until the baby was weaned and menstruation had returned. Then they came back just as before and she has had them ever since. Three months ago, November, 1895, they came somewhat more frequently, and for the first time in her life between the periods.

"From the close association of the convulsions with her periods I was induced to remove the ovaries, but so far the operation has not had a very gratifying result; she is just about as bad a year after the operation as she was before."

In case V. it would seem that the physiologic phenomena of pregnancy took up the nervous force in this woman and prevented the attacks during gestation and subinvolution. How much longer cessation of fits (now one and one-half years into the post-gravid state) will continue is the anxious question.

This instability of nerve-center coördination is illustrated in Case VI., in

which three months after pregnancy the attacks recurred severely after a lapse of many months before the gestation.

Case VII. is very instructive, as the patient was carefully treated medicinally from childhood without avail. The fact that the epilepsy began before puberty, without other disease, would make it an idiopathic case. The intimate relation of the attacks later to the time before or after her menstrual periods, at times replaced by choreic movements; the great lessening of the fits during the pregnancy, only to again be lit up fifteen months after labor when the periods had returned; and the final just ablation of the ovaries, all prove that the genital organs were only irritants, not causes, of the fits, which have continued.

This case illustrates in part the statement which Dr. S. Weir Mitchell was good enough to make for me:

"I have had considerable experience, covering many years in this matter, and I can say that I have never seen epilepsy made worse by pregnancy; I have frequently seen it made better—the attacks occurring less often. This seems to me to be accounted for by the absence of menstruation, which is a condition in epileptic women inducing attacks; at least the spells at that time are more frequent. I have seen cases (I cannot remember how many) in which the attacks have entirely ceased during pregnancy; in one of such cases the spells did not return until after seven months of lactation. I do not know that the presence of the ordinary type of epilepsy without known organic lesion has any effect upon the dangers of confinement."

CASES VII., VIII. AND IX.—Dr. Richard C. Norris sends the following notes of his experience at the Preston Retreat: "There have been three epileptics in the last 750 cases. In two of the cases the patients had their fits more frequently throughout pregnancy; in one case the patient said she felt better and the intervals between attacks were longer. I have had no opportunity to learn the subsequent histories of these cases. The first two cases mentioned were multiparæ, the third was a primigravida."

CASE X.—In August, 1896, a colored

woman, thirty-three years old, was brought in the "patrol-wagon" to St. Agnes' Hospital, having fallen on the street in a general epileptic convulsion. She gave a history of idiopathic epilepsy from the age of fourteen, had borne three children and had never had an attack during pregnancy. The patient told the interne, Dr. Milligan, that she "wished she could be with a child all the time."

Drs. R. P. Hamill and W. C. Goodell permitted me to look up the records at the Maternity Hospital, but I could find no epileptic cases among the 300 women delivered in that institution.

I have gone over all the cases at the Lying-in-Charity Hospital with the kind permission of Dr. W. Reynolds Wilson and Dr. George M. Boyd. Of 1,200 consecutive cases the records are very complete in 482. While there were the usual number of cases of uremic convulsions during and after pregnancy, I could find no distinct case of epilepsy during gestation, and Dr. Wilson writes that he has no knowledge of any such cases that may have been omitted in note-taking. As women are only in maternity hospitals several months, attacks may well have not occurred during that time; hence such meager data might be misleading.

At the "Midnight Mission," where girls illegitimately pregnant are kept from the first up to the eighth month of gestation, the matron tells me that out of 152 cases in the last two years only one was subject to fits. The relation to the pregnancy was not ascertainable.

To prove that attacks of epilepsy during pregnancy are difficult to trace I have made inquiry among general practitioners, with the result that few men of wide experience have any records of such; and who would have better opportunity to follow out cases than the family physician?

Dr. H. H. Herbst, of Allentown, who has the record of but one case of idiopathic epilepsy and pregnancy writes as follows: "I have a case (XI) under observation at present in a woman twenty-seven years old, whose first child is now six months old, and so far she

has had only one fit since the birth of her child. Before her pregnancy she had attacks once a month lasting from ten to twenty minutes at a time, this even under the influence of large doses of bromids. During the whole period of gestation she only had one fit, and this was of short duration, and the bromids had been reduced one-half during pregnancy. She had no bromids during the puerperium, until ten days ago, after her first fit."

Dr. Morris J. Lewis makes this general statement in regard to two cases of pregnancy in idiopathic epilepsy. "In both cases, aged twenty-five and twenty-nine respectively, there was no attack during pregnancy, only to be recurrent afterward."

Dr. John B. Chapin informs me that in the 6,800 women admitted to the Pennsylvania Hospital for the Insane he has no knowledge of pregnancy having influenced the epilepsy. Of course epilepsy with maniacal outbursts only would be admitted to a hospital for the insane, and therefore these figures have but little bearing upon the subject under consideration.

In recently going over the books at the Infirmary for Nervous Diseases for another purpose, I found since 1889 some 300 cases of epilepsy recorded, of which seventy-seven were in females at maturity, married or single, of whom seven bore children, or at least became pregnant, and the histories are traceable.

CASE XII.—E. D., thirty years old, has had epileptic seizures since the age of twenty-eight years. The supposed cause was a miscarriage in February, 1890, after which she was very nervous. Three months later at night she had the first attack, bit her tongue, etc. The second attack occurred three months after the first, the third nine months later, when she had also several seizures of *petit mal*. At further intervals of seven weeks and two months she had her fourth and fifth attacks respectively. Dr. de Schweinitz found the optic discs too red and also slight astigmatism.

This case of epilepsy seems to have been excited by a miscarriage. The patient has had no children since.

CASE XIII.—M. B., a white woman, aged forty-four years, presented no psychotic or neurotic heredity. She menstruated first at fifteen years, and normally until the age of thirty-four years, when the periods became irregular. She was the subject of amenorrhea for four months. At this time she became very nervous and one night she had a regular epileptic attack, frothed at the mouth, and had a clonic convulsion. The tongue was not bitten. She had borne two healthy children up to the time of her illness, but none since. When she reported to the clinic on March 6, 1896, she was anemic and troubled again with amenorrhea for the preceding six months.

This woman was clearly perturbed by the monthly irregularity. There has been no special relation of the attacks to the menstrual periods, however. The menstrual disorder was no doubt the exciting cause of the epilepsy.

CASE XIV.—M. B., a white woman, twenty-nine years old, is not an example of idiopathic epilepsy, but her case is here mentioned only to show how pregnancy may be the cause of epilepsy through an apoplectic attack. It leads to the thought, too: Why should not puerperal convulsions be more frequently followed by epilepsy?

This woman, three weeks after labor, at the age of twenty-six, had an apoplectic stroke, with consequent left hemiplegia and left lateral hemianopsia. Speech was thick for a month or so. There was no loss of sensation. Two weeks after the stroke she had a clonic convulsion confined to the left side. Since then she has had a fit every two weeks, beginning on the left side, but in the last year also becoming general.

CASE XV.—A. V., a white woman, forty-one years old, has three children, living and well. One child was said to have died of hydrophobia. The patient had menstruated first at eighteen years, at which time she was married, by the advice of her physician. After the first intercourse she had a convulsion, with general movements, bit her tongue, and was unconscious for four hours. She then had attacks every night until she became pregnant. The attacks now

ceased until two months after delivery, when they recurred, though less frequently. *The woman has borne five children and never had an attack while carrying them.* At the age of thirty-seven years she had both ovaries removed, but without effect on the attacks, which have continued about once in three weeks.

Evidently here is a woman of neuropathic diathesis, whose delayed menstruation was brought on after marriage at eighteen, and with a convulsive seizure at the same time. As the ovaries removed were normal we must call the case an idiopathic one. At the same time a reflex irritation, originating in the genital tract, appears to have excited the epilepsy. Perhaps the nerve-energy mainly diverted to the womb during gestation then stopped the attacks by reducing the afferent impulse-overflow to a minimum.

CASE XVI.—E. B., a woman aged forty-two years, had no hereditary taint. Menstruation was established normally, and she was married at the age of twenty-one years. The attacks began at the age of twenty-five years. The patient has borne six children, all in good health excepting one that was treated at the clinic for chorea. The patient has never miscarried. The first attack occurred at night. The supposed cause was a sore throat. This woman reported in March, 1892, having on an average an attack every week. Dr. Hirst could find no abnormality of the genitalia. We can find little evidence of modification of the epilepsy during her rather frequent pregnancies, so that the case illustrates the fact that in rarer cases the seizures may go on practically uninfluenced in a prolific mother, and the children not seem to manifest any neurosis.

CASE XVII.—A. B., twenty-two years old, menstruated first at the age of seventeen years. She had a vague history of four or five attacks of *petit mal* when seven years old, but none from then until the age of seventeen years. The first fit occurred on the third day of her first menstrual period. After this she had an attack every month. At the end of six months she was married, and a

healthy child was borne in nine months. The attacks were somewhat lessened during gestation. With the puerperium the attacks began to occur weekly, and for six months previous to the date of reporting she had, besides, a reversion to slight attacks (*petit mal*), of which, at times, five occurred in a day.

This woman was evidently drained by the pregnancy, and especially during lactation, so much so as to further reduce her, and thus, very probably, to increase the attacks.

CASE XVIII.—F. R., forty years old, reported January 16, 1895. Her menstruation appeared only after marriage, between seventeen and eighteen. Here again marriage and coition set up epileptic seizures apparently, for the woman had never had a fit before. She has borne three children. One is said to have died of hydrophobia; one died while teething, and one is living and well. The patient never had a miscarriage.

She has had no attacks during pregnancy and for some months afterwards, when they again recurred. Menstruation has had no effect on the attacks in the interim. Oöphorectomy six years ago seems to have lessened the frequency, but not the severity, of the fits. The urine and organs were normal. At present she has an attack once or twice a week.

The case rather illustrates again the intimate relation between the sexual organs and the higher nerve-centers, brought out prominently in certain individuals, and yet in the absence of evident disease. It is only a different phase of a neuropathy, as exemplified in the delusions, hallucinations and morbidity of the sexual neurasthenic. The difference is only an expression of the excited neuron.

CASE XIX.—Dr. Helen Kirschbaum has seen but one case of pregnancy and epilepsy at the Jewish Maternity, and that is an interesting one. A German woman, aged twenty-five years, a primipara, reported in December, 1893, giving a history of generalized attacks of *grand mal* for several years, occurring once in three months, and mostly at night during sleep. She would be stu-

porous for several hours after the fit. After pregnancy this woman began at once to have her attacks at intervals of from one to ten weeks. She was brought into the hospital with the os dilated and a transverse presentation. It was thought that labor was about to come on. Version was effected and, to Dr. Kirschbaum's surprise, when the fetus was placed in its normal position labor was delayed, and the woman went to term and was delivered of a healthy child a month later, and remained under observation for two months into the puerperium. It is of interest to note that the attacks did not occur after version was performed, although they had taken place weekly immediately preceding. This fact seems rather a co-relation than a coincidence when it is remembered that the attacks were distinctly increased after pregnancy, and it leads to the thought that the gravid womb and the malposition of the fetus excited attacks. From the foregoing study the following

CONCLUSIONS

may be drawn :

I have thus detailed nineteen cases of pregnancy in idiopathically epileptic women. Where not otherwise mentioned the kidneys in all cases were normal. The evidence is pretty conclusive that there is a wide range of effect on the number and frequency of epileptic seizures in pregnant women the subject of this disease so little understood. The results of this research also show clearly that in the majority of cases the attacks are lessened in frequency during pregnancy. This would preclude the possibility of intestinal auto-intoxication being the primal cause of any epilepsy, for during gestation constipation is the rule, and toxins therefore are more readily generated in the gastro-intestinal tract. Yet it cannot be doubted that such poisoning is an excitant of the already unstable brain-cell in exceptional cases.

As stated in the body of the paper, the referring of nerve-energy in the physiologic process of pregnancy to the uterine organs prevents any excitation of the motile brain-mass, and in those cases in

which the attacks are increased some irritation must exist that we are not able to fathom. It is well known, too, that attacks are often lessened in inter-current disease in epileptics.*

Then there are two classes of epileptics, one in which degeneration of the neuron soon supervenes upon idiopathic epilepsy, and a second in which degeneration is much delayed after these ter-

rible explosions. The great Napoleon was an example of the second group. Which incipient cases in pregnancy belong to the first or to the second group is unknowable. Therefore the protean effects of the normal drain of pregnancies upon the epileptic woman cannot be foretold. We can but hope to cut off the marriage of epileptics as a means of positive favorable solution in favor of the present and future generations.

In conclusion I desire to thank the physicians who have kindly contributed to this collective study.

*Other references: (a) Brown-Sequard and Bourneville, *Researches on Epilepsy, and Phys. and Path. Cent. N. System, 1857-1860*; (b) Hubert, *Des Convulsions, These de Paris, 1857*; (c) Savary, *Dict. Enc., 60 vol., Art. Convulsions, 1813, V. VI.*

