

## ANTERIOR POLIOMYELITIS COMPLICATING PREGNANCY, WITH REPORT OF TWO CASES\*

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The scarcity of any spinal lesion complicating pregnancy has made the study of such conditions rather limited. Few positive deductions and naturally few conclusions are possible.

The writer was stimulated in his study of spinal lesions complicating pregnancy, and more especially anterior poliomyelitis, by the occurrence of two such cases, one under direct observation in the University Maternity Clinic, and the other in the practice of a very prominent member of this Society.

### CASE REPORT

The first case—Mrs. B., age 26, para three, was admitted to the University Maternity Clinic on October 8, 1921. The patient's past history was negative. During her ten years of married life she had had three full term pregnancies, each terminating in a normal delivery. The present illness dated back to September 3, 1921, when she first noticed a chill, followed by a sharp pain in the rectum. This pain lasted about five minutes. Following this, an extremely severe headache with marked leg and backache was complained of. Two days later the patient noticed, on awakening in the morning, that her legs were very weak. This weakness became more marked until a complete paralysis of both lower limbs, of

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the abdominal muscles, and bladder sphincter, existed. The paralysis of the bladder sphincter, with incontinence, lasted only twenty-four hours. Except for a slight recovery in the toes of the right foot, the paralysis had remained unchanged up to the time of admission.

Examination on admission one month after the onset of the disease revealed a four months pregnancy. The patient's general health was fair. Pelvimetry showed a normal pelvis. Neurological examination showed a bilateral foot-drop with a flaccid paralysis of both legs, except, as mentioned above, for a slight amount of flexion of the toes of the right foot. Sensibility to touch and pain were preserved. All deep reflexes were absent. The spinal fluid was under normal pressure, clear, and showed five cells per cubic millimeter. There was no reduction of Fehlings solution in fifteen minutes.

Blood examination showed a negative Wassermann. The hemoglobin was 80 per cent, the red count 4,360,000, the white count 8,950. The urine was normal.

The remainder of the patient's pregnancy was entirely uncomplicated. Casts were applied to the limbs, and daily massage, with intensive and varied exercises for all muscles inaugurated.

On March 15, 1922 the patient's membranes ruptured. A few contractions followed, but for two days the patient had only vague and occasional pains. On March 18, definite rhythmic contractions began. Rapid progress was made, and at 3:00 p. m. of the 18th the patient was delivered of a six and three-quarter pound male child. The third stage was entirely normal.

Careful examination of the child revealed a slight bilateral club foot. In view of the frequency of club foot, the responsibility for its occurrence in this case can scarcely be ascribed to the mother's illness.

At the time of discharge from the hospital, the mother's general health was good. Her paralysis, however, was but slightly improved. In addition to the flexion of the toes of the right foot, a slight control over the abdominal muscles had been regained. The child was in good health and the condition of the feet greatly improved. On September 11, 1923, a year and a half later, the condition of the mother was unchanged. The patient is unable to walk, even with assistance of crutches. The child was well and apparently normal.

Case No. 2. Through the kindness of Dr. George Kamperman of Detroit, I am permitted to report here

a second case. This patient, a nullipara, had shown, immediately following the onset of poliomyelitis, a complete paralysis of the left leg with urinary and fecal incontinence. The fecal incontinence had cleared up early. The paralysis of the bladder had remained, resulting in an extremely severe cystitis. When seen by Dr. Kamperman, the patient was six months pregnant. Her condition was extremely poor and septic, and the paralysis of the left leg and bladder was still complete. The abdomen was distended and the temperature considerably elevated. Apparently the chief cause of the patient's poor condition at this time was the fulminating cystitis. Hoping to improve this condition, a vaginal cesarean was performed. Almost immediate improvement in her general condition was noted. Her temperature rapidly returned to normal. The bladder paralysis, curiously enough, continued for three months longer, normal function returning at the end of that period. Improvement of the left leg continued, and at the present writing the patient is able to be about on crutches. The child, though still-born, was in no way deformed.

At a glance one might expect a study of the literature to reveal many cases such as those just reported, and although there is much literature on anterior poliomyelitis, there is an extreme dearth regarding this condition as a complication of pregnancy. This is striking when we consider that there have been over two hundred epidemics of this dreaded disease since it was first reported by Michael Underwood, in 1784. (6). A careful study of both domestic and foreign literature has revealed no clear-cut case of this complication. This may be accounted for in several ways. Many cases which appeared to classify under this heading, on closer inspection were either not poliomyelitis at all, or of such vague and indefinite description that they could not be utilized as bona fide cases. In all, at least eighteen different names have been applied to the condition. Other cases, no doubt, have occurred, but have remained unrecorded, or possibly undiagnosed.

In the study of this condition as a complication of pregnancy, it is of primary importance to remember that poliomyelitis is an acute infectious disease and its effect upon the general health of the fetus as well as the mother, must be considered.

#### EFFECT OF THE DISEASE UPON PREGNANCY

In so far as the two cases studied permit conclusions, the direct effect upon pregnancy seems slight. With the onset of secondary complications such as the cystitis in the last case reported, an extremely critical situation might arise. While the temperature may be sufficiently high to endanger pregnancy, it is usually of such short duration that any danger from this source would be slight. The extent of the paralysis is extremely important. Generally this is not sufficient to interfere with the normal functioning of the vital organs of the body. Where, however, the paralysis involves the diaphragm or other respiratory muscles, considerable danger exists, not only for the life of the fetus, but the mother as well. Fetal death from such a severe respiratory disturbance might well occur. In the first case reported, there was a temporary paralysis of the bladder. This paralysis is not usual in the typical cases, and where it does occur, is usually of short duration. In the second case reported, a marked deviation from the rule is to be noted. Should this condition continue for any length of time, it is reasonable to expect such complications as might arise from a severe cystitis. The seriousness and degree to which this might extend have been well shown in case number two.

#### EFFECT OF THE DISEASE UPON THE FETUS

The possible effects upon the fetus are

manifold. Although the child in the first reported case showed a mild bilateral club foot, it cannot be concluded that this was due to the mother's illness. Of paramount importance here is the question of transmission of the virus from mother to fetus, with the accompanying paralysis. How extensive this paralytic involvement might be should transmission occur, can, of course, be only surmised. It seems reasonable to assume, in view of the numerous available facts, that transmission of the disease from mother to fetus in utero might easily occur. Thus Rosenow (5), in 1918, demonstrated selective localization by injecting streptococci, isolated from lesions of a certain part of the body, into animals, and showing similarly localized lesions in a large percentage of cases. The transmission of measles, scarlet fever, and other contagious diseases, has been reported. Kramer and Wright (4) reported the case of a woman eight months pregnant, who died of cerebro-spinal meningitis before delivery. Autopsy revealed extensive congestion with pus formation over the meninges in both mother and child. Bacteriological tests revealed similar organisms. With these facts before us, and recalling that anterior poliomyelitis is an acute infectious disease, the possibility of fetal involvement becomes very apparent. The fact that the disease usually affects children might have a tendency to favor fetal involvement. On the other hand, the question of a passive immunity must be considered. If this exists, the danger of fetal involvement need not be seriously considered. If the immunity is not great, and the transmission of the virus takes place, the condition will probably be manifest in the fetus as an abortive, rather than the paralytic type. The question of fetal asphyxia

has already been mentioned. When the maternal paralysis involves the diaphragm or other important respiratory muscles, the circulatory and oxygenating processes may be so deranged as to render fetal asphyxia probable.

#### EFFECTS OF PREGNANCY UPON THE DISEASE

In so far as the two cases reported are concerned, no definite answer to this question can be made. In the first reported case, the pregnancy went to term. In the second case, pregnancy was interrupted at the sixth month. The latter individual has made considerable gain and improvement. Whether this improvement was the result of an early emptying of the uterus and its effect upon the disease, or simply the diminishing of the burden in an extremely sick woman, cannot definitely be stated. More cases must be available for study and observation before this question can be answered. Indeed, it is quite possible that emptying of the uterus at such a crucial time might be extremely detrimental rather than beneficial.

#### EFFECT OF THE DISEASE UPON LABOR

This is probably the most important question of all. The question is frequently raised as to whether normal uterine action may be expected or not. The probability of a normal delivery necessarily depends on several factors: The extent of the paralysis; the condition of the patient; the size of the child, pelvis, etc. I shall not go into detail regarding the nerve supply to the uterus, because it is still a much debated question and apparently of little importance so far as delivery is concerned. It has been quite conclusively shown that the action

of the uterus is principally myogenic rather than neurogenic. Barber and Copenhaver (1) have shown the existence of a definite cerebral influence over the volume of the uterine cavity, but the importance of this during labor is probably not great. Animal experiments have conclusively demonstrated that all parts of an excised uterus, whether pregnant, multiparous or virgin show automatic, rhythmic contractions, and further, that normal delivery may take place with all nerves to the uterus severed. Cushny (2) concluded from his observation on animals, that the contractions of the uterus on mechanical or electrical stimulation were purely muscular and not nervous in origin. In the human, very similar results have been observed. Thus, Jackson (3) reported a normal painless delivery in a woman with a spinal cord tumor of three years standing, with complete paralysis below the waist. Reports of somewhat similar occurrences are not uncommon.

The first stage of labor may be normal, as reported in case number one in this article.

During the second stage of labor, however, slow progress is to be looked for, especially if the voluntary forces which are principally active during the second stage, are paralyzed. With this prolonging of the second stage, indications for interference would necessarily increase. That the entire process of labor may be nearly normal, was well demonstrated by the case reported from the University Clinic. Where prolonged bladder paralysis exists, as noted in the second case, the possibility of hemorrhage following delivery must be thought of. In this respect a full or distended bladder might interfere with the normal contraction of the uterus during the third

stage, and increase the tendency to post-partum bleeding.

Since only two cases were available for study, no conclusions can be drawn. A few general statements, however, may be permissible.

1. The effect of pregnancy on anterior poliomyelitis remains a debated question. Observations on the two cases reported reveal the two extremes. In case number one, the pregnancy did not seem to aggravate the disease. In case number two an extremely serious secondary complication arose.

2. The direct effect of anterior poliomyelitis on pregnancy would seem slight. That pregnancy may be endangered through concomitant complications is shown in case number two.

3. The advisability of interrupting pregnancy for this condition is yet to be determined.

4. The fetus is not necessarily affected by the disease.

5. Normal delivery in pregnancy, complicated by anterior poliomyelitis, is possible.

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