

## NEURITIS IN PREGNANCY.

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PERIPHERAL neuritis occurring during pregnancy may develop before or after labor, and may be local, involving a single nerve, or multiple, involving a number of nerves. It varies in severity from a simple disturbance of sensibility to complete anesthesia, paralysis and muscular atrophy. The less marked degree of involvement characterizes the cases occurring during the early months of pregnancy, whereas the more extensive processes may occur at any stage of gestation or of the puerperium.

*Etiology.*—Neuritis in general may be of either central or peripheral origin and it is the latter type which is commonly associated with the pregnant state. The causes of such a peripheral neuritis are many and they vary with the time of onset of the condition. Cases which develop after delivery are most often due either to trauma from pressure of the fetal head, involving the branches of the sacral plexus, to pressure in the popliteal space from prolonged acute flexion of the knees or from the use of leg holders, or they are found in patients suffering from puerperal sepsis or marked puerperal cachexia.

During the course of gestation and before delivery the frequent association of neuritis with hyperemesis gravidarum or some of the various other manifestations of toxemia of pregnancy points to the probable causal effect of toxins circulating in the body. Similarly alcohol may produce a type of neuritis such as is found in the non-pregnant state, instances having been reported where such conditions have cleared up immediately after delivery or after the termination of pregnancy.

Syphilis, profound anemia, general debility, exposure to cold, and local pressure or irritation may also be factors.

Frequently none of these conditions are present and such cases con-

stitute the group of so-called idiopathic origin. These are supposed to be due to a disturbance of metabolism resulting in the absorption and circulation of toxic substances throughout the body. Intestinal stasis may well be considered in many cases, although direct evidence of the presence of such a condition is lacking in cases which have been reported. The occurrence of such a process is suggested by the frequent finding of indican in the urine. In a case observed by the writer the presence of visceral ptosis with a moderate degree of stasis had been previously determined at laparotomy and the degree of stasis had been markedly increased prior to the onset of neuritis.

These cases of idiopathic origin resemble greatly the neuritis and paralysis caused by reflex irritation, to which attention was called by Brown Sequard who quoted instances, of genitourinary disease especially, which were accompanied by paralysis in various regions of the body. Similarly, uterine disease, such as cervical erosions or uterine displacements have been complicated by paralysis which disappeared after correction of the pelvic disease. That such cases are found in most instances to be associated with genitourinary disease in either sex would seem to imply that the explanation may be found in the rich supply to those parts of nerve fibers from the sympathetic system. In addition to true neuritis there occur various sorts of neuralgia and paresthesia associated particularly with the onset of pregnancy. Most of these disturbances are without real foundation and are attributed to the mental state of the individual. Sometimes, however, true neuritis does occur at that time.

*Pathology.*—Owing to the infrequency of death in this condition, reports of pathological findings are few and such observations as are available are necessarily instances of neuritis of the most severe type. The nerves probably undergo the same changes as are found in similar types of neuritis in the nonpregnant individual.

Korsakow and Serbski reported a fatal case of the multiple variety in which there was found parenchymatous neuritis of the nerves to the extremities, with changes in the lumbar and sacral plexuses and in some of the cranial nerves. There was also an increase of neuroglia in the columns of Goll and in the lateral columns of the cord.

Stewart reported a case which began in the seventh month of pregnancy and continued until the fourth month after delivery when death ensued from paralysis of the diaphragm. Autopsy showed parenchymatous neuritis of the vagus and phrenic nerves and the nerves of the extremities, with changes also in the anterior horns and posterior columns of the cord.

Lindemann demonstrated in his case that the nerve lesions were associated with degenerative changes in the liver and kidneys.

Parenchymatous changes occur probably in a comparatively small proportion of cases, corresponding very likely to those cases in which electrical examination shows reaction of degeneration.

*Symptoms.*—Local or multiple neuritis may occur either before or after labor, and according to the time of onset it may be classed as conceptional, gestational or puerperal.

#### CONCEPTIONAL NEURITIS.

Patients frequently complain of vague disturbances of sensation such as numbness, tingling, or even acute pain at about the time of conception, and it is a popular notion that such conditions are to be expected at that time. How many of these changes are due to real disease and how many to the mental attitude of the patient it is impossible to determine, but the latter is unquestionably the essential factor in most cases. A state of expectancy or anticipation places the mind in a receptive mood and the individual becomes susceptible to misinterpretations of ordinary sensations. Paresthesia or neuralgia is certainly much more frequent at this time than is true neuritis or paralysis, but the latter is occasionally observed, as in the following case where paralysis was apparently coincident with the beginning of pregnancy.

*CASE.*—Mrs. P., aged twenty-seven. Married two years, no previous pregnancy. No family or past history of nervous disease. One year ago an appendectomy was done. Operation revealed a chronically inflamed adherent appendix with marked ptosis of transverse colon and cecum. Periods always regular, last began ten days ago. Present illness began as a dull aching pain in the region of the glenoid fossa and became steadily more severe. There was no pain on motion of the jaws but there was slight tenderness about the articulation of the jaw. The mouth or teeth showed no evidence of disease and the examination of the ears was negative. Reflexes were normal and general physical examination was negative. Urinalysis showed no abnormality save the presence of indican.

Five or six days later the patient noticed some difficulty in controlling the muscles of the right side of the face, particularly when eating. The whole right side of the face became extremely sensitive to touch and to cold, and two days later this was followed by total anesthesia and typical facial paralysis. The face was kept warm and the eye irrigated frequently with boric acid solution.

Paralysis continued for two weeks, after which time the muscles began to contract again, and the face acquired its natural ex-

pression and function two weeks later. Five weeks after the onset of pain the paralysis had entirely disappeared. At this time the patient noticed that the breasts were slightly enlarged and painful, and inquiry elicited the fact that the catamenia were over due for the first time that she could remember. Vaginal examination showed enlargement of the fundus with a soft cervix, and a tentative diagnosis of pregnancy was made and confirmed later. Pregnancy proceeded without further event and with no evidence of toxemia.

#### GESTATIONAL NEURITIS.

Multiple neuritis is more common than a local process during pregnancy, and it may occur either in the early or later months, due usually to pressure of the descending head on the fibers of the sacral plexus. When not due to pressure there is frequently evidence of toxemia or renal disease. It has been stated that the cranial nerves are rarely affected before delivery and that such cases as are occasionally seen may be of central rather than peripheral origin.

Mild cases show paresthesia or hyperesthesia with no paralysis, and recovery occurs before delivery. More severe types occur, with paralysis and anesthesia first in the legs, later perhaps in the arms also, and recovery may be delayed for some time after labor.

Mental changes together with muscular paralysis, as described by Korsakoff, form a considerable proportion of these cases.

#### PUERPERAL NEURITIS.

Local paralysis is much more frequent after labor, even in those cases which cannot in any way be attributed to direct pressure on nerve trunks. Pressure paralyzes affect most often the sciatic and peroneal nerves and occur especially in elderly primipara or after a complicated labor. Pelvic inflammation with massive exudate may also exert pressure on the nerves in the pelvis and result in neuritis. Aside from such mechanical causes a definite local neuritis occurs, involving most frequently the median and ulnar nerves. The anterior crural, obturator and occasionally one of the cranial nerves may be affected. Koester reported a case in which the axillary and musculocutaneous nerves were involved, and Nothnagel reported a paralysis of the deltoid, serratus and pectoralis muscles. Many of the cases reported have occurred in patients who have shown evidence of puerperal sepsis.

#### LOCAL NEURITIS.

The onset is sudden, with or without fever and with few constitutional symptoms. The process varies from simple paresthesia

to complete paralysis and anesthesia. Severe pain of a stabbing or boring character is an early symptom. The area of distribution of the affected nerve becomes sensitive to touch and perhaps to changes in temperature. This is followed by decreased sensibility and impaired muscular action. The skin may become reddened and hot and the nerve itself may be sensitive to pressure and even somewhat thickened. After a variable time, usually brief, sensation is entirely lost and paralysis becomes complete. This paralysis may be transient or may result in real atrophy and permanent impairment of sensibility.

Electrical reactions vary, as in ordinary neuritis, with the extent of involvement of the nerve and the nature of the lesion. The prospect of repair and recovery is indicated by a careful electrical examination. In mild cases there is no change in muscle or nerve reaction, whereas in severe cases a typical reaction of degeneration appears.

The nerves of special sense are rarely involved in a peripheral neuritis not due to local irritation or pressure, but cases have been reported where ocular paralysis, hemiopia, amblyopia, and deafness have occurred. Edgar states that neuritis localized in the facial nerve is extremely rare and is usually due to profound anemia. Saenger has reported one case of bilateral facial paralysis. These cases are to be carefully distinguished from neuritis of central origin, due to hemiplegia, anemia, thrombosis, cerebral hemorrhage or paraplegia.

#### MULTIPLE NEURITIS.

Attacks of multiple neuritis appear spontaneously during pregnancy, usually in the middle or latter months, and may be accompanied by marked general reaction. The onset, with headache, anorexia and fever, may suggest acute infection. Tingling of the hands and legs with tenderness along the course of the nerve follows, and this may shortly afterward be succeeded by sensations of numbness or anesthesia with loss of muscular power. Pain may be severe or slight even with extensive paralysis. Mild cases may develop only stiffness of the limbs and increased sensitiveness of skin surfaces, whereas severe cases may go on to muscular degeneration with complete paralysis or even to death.

Recovery is slow in proportion to the extent and severity of the process, and the condition often persists until after delivery.

*Diagnosis.*—In a well-marked case diagnosis is easily made from the history of tingling or sharp pain, followed by numbness or anes-

thesia and paralysis of the muscles supplied by one or several nerves. Similar nerve changes due to mechanical factors, to intercurrent infection or toxemia, or to central nerve lesions should be distinguished, and in any case a focus of local irritation should be sought.

Mechanical conditions producing neuritis include pressure of exudate in pelvic inflammatory disease, which probably includes many of the so-called idiopathic cases associated with fever or other evidence of infection; pressure of the fetal head late in pregnancy or during labor; and direct pressure of apparatus used to maintain flexion of the legs during delivery. Two other conditions simulate neuritis: rupture of the symphysis pubis and separation of the sacroiliac synchondrosis. Both of these conditions produce muscular disability due to acute pain. There is no real nerve injury in either instance.

Syphilis, alcoholism, local infection all produce neuritis and recovery may be delayed until pregnancy is terminated, as in a case of alcoholic neuritis reported by Le Page and Lawton.

Neuritis of central origin is often associated with toxemia of pregnancy. The lesions may be cerebral as in septic thrombosis, edema of the brain, cerebral hemorrhage or cerebral anemia. In ocular paralysis, especially, it is well to bear in mind the probability of central origin. Spinal paraplegia is only coincident, except in conjunction with toxic conditions. Bilateral sacral neuritis resulting from pelvic inflammation may simulate myelitis, from which it is distinguished by the absence of sphincter paralysis.

*Prognosis.*—Death occurs rarely, especially so when there is no central involvement. In general the prognosis is better in local than in general neuritis, the latter more often resulting in permanent paralysis and muscular atrophy. The process is especially severe in cases suffering from obstinate vomiting, and septic cases show a tendency to early atrophy. Mental changes in connection with neuritis give a poor outlook. Lesions appearing during pregnancy and which do not disappear in three or four weeks may persist until shortly before or after delivery.

Recurrences are unusual, although Gowers reported a case of a woman who had puerperal ulnar neuritis after two confinements. Relapses occur more often, but in such cases an undiscovered focus of irritation should be sought.

When caused by mechanical factors the prognosis is good if the condition is due to pressure applied for a short time, but recovery is slow in cases of extensive pelvic inflammation when pressure of the

exudate is continued for some time. In the latter case the process may extend until it involves the whole sacral plexus.

Treatment varies with the nature and extent of the process. An attempt should be made to eliminate all sources of irritation or toxemia. Mild cases clear up in two to three weeks without treatment. In more obstinate cases massage and electrical stimulation may be advisable, but many cases will recover only after delivery. In these cases treatment is directed toward prevention of muscle degeneration until such time as delivery occurs.

#### SUMMARY.

1. Local or multiple neuritis may occur during early or late gestation or during the puerperium.
2. Multiple neuritis is more serious and is met usually before delivery, local neuritis after delivery.
3. Such neuritis may show none of the causes usually associated with neuritis in the nonpregnant individual.
4. It resembles the neuritis and paralysis often found in association with pelvic or genitourinary disease.
5. The prognosis is favorable, although the condition may persist until after delivery.

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