ENCEPHALITIS LETHARGICA

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I HAVE no intention of giving a dissertation on this subject, but thought it might be interesting if I reported the cases which have been thus diagnosed in the Montreal General Hospital up to the present time. There has been no epidemic, but these cases have been occurring sporadically, the first being in October, 1919.

As has been often noted there are no pathognomonic signs or sypmtoms, and probably the only cases about which there can be absolutely no dispute are those in which the lesions are demonstrated on the autopsy table.

Fortunately this is not always possible as many recover, so that each case has to be judged by itself, and the diagnosis is made rather by exclusion of other causes for the nervous symptoms present than positively by the presence of any definite symptoms or signs.

Of course, in cases where there is a febrile onset with headache, delirium of an occupational character, transitory diplopia, paralysis or paresis of some limb or limbs, with possibly a cerebro-spinal fluid under pressure and containing an increased number of cells, the diagnosis is not difficult, but it is the atypical and often less severe cases which give room for discussion and doubt, so that in some cases diagnosis may rest on reasons not much if any more conclusive than, "If it is not that, what is it?"

There have been under treatment in the hospital fourteen cases of which four have died. In all these cases, except one which will be mentioned, syphilis was excluded, the Wassermann reaction being absent in both blood and spinal fluid. In some cases the cerebro-spinal fluid was under pressure, in some not. In most there was a varying degree of increase of cells, but even with an increase in the number of cells, the globulin reactions were at times absent. In some the blood showed moderate leucocytosis, in some none.

Of the four fatal cases two were the first cases of this disease known to have been admitted to the hospital. Both of these cases were foreigners though living in Canada for some time, one being an Austrian, the other an Italian.

The former was admitted almost moribund and died the same day. He showed marked external strabismus and paralysis of the seventh nerve and left arm. His pupils were unequal and inactive. His cerebro-spinal fluid was turbid and gave the highest cell count recorded, 510 per cubic millimetre. His temperature rose before death to 105-2/5. This was the most acute case noted as the illness apparently only lasted eight days.

In the second case recorded the disease ran a more chronic course, that is of about three weeks from the time he left off work, but he gave a history of increasing headache for about two months before this time and of increasing drowsiness. These symptoms with delirium, retention of urine and diminished sensation over the whole body, except the face, were the most marked during the course of the disease, and a notable feature was that it was only a day before death that any weakness of the cranial nerves was noted: at that time there was a divergent squint and the left side of the face seemed paretic. At first the only pathological reflex was a slight Oppenheim on the right, but later the knee jerks disappeared and there was a slight Babinski on the right side. There was a very high antemortem temperature, 108-2/5. The cells in the cerebro-spinal fluid were increased at the three counts made (70 to 162), but at first the globulin tests were negative.

In both these cases the brain showed oedema and sections showed collars of lymphocytes around the blood vessels and lymphatic infiltration of the pia-arachnoid.

A third fatal case was in a woman aged 47. In her case the most marked signs, loss of sensation over the whole body with general weakness of all limbs, though no paralysis existed. The

pupils were unequal and reacted sluggishly to light. She died rather suddenly and no autopsy could be obtained.

The fourth fatal case was the only case in this series in which syphilis was shown to be present: his blood gave a strongly positive reaction. This was also the only case in this series in which there were marked choreiform movements present. These movements formed a prominent feature in his symptoms. He was restless and irrational rather than lethargic. In this case there was a history of double vision before admission, but no inequality of eye movements were noted during his stay in the hospital.

As this case is being considered by Dr. A. H. Gordon in his paper at this meeting, I will not mention it further.

Of the non-fatal cases two were cases of the more typical symptomatology, but of less severe grade and both made almost perfect recoveries before leaving hospital. In one the diagnosis was obscured at first by a history of previous syphilis, but Wassermann tests on blood and cerebro-spinal fluid were negative and he recovered without any antisyphilitic treatment.

Another case was in a member of the medical profession and showed onset with general symptoms of gastro-intestinal disturbance of diarrhaea and intestinal pain followed by constipation. He entered the hospital about ten days after the onset of the disturbance with fever of 101, rising the next day to 102. This fever gradually subsided but there was more or less fever for about two weeks. He showed much drowsiness and delirium of an occupational character, answering telephone, giving anaesthetic, etc.

In this case the localizing symptoms were principally referred to the legs, especially the left leg. There was great complaint of pain at the onset in the left thigh, especially the lower third, coming on in very severe spasms, comparable to lightning pains. There was a point of extreme tenderness just above the inner condyle. X-ray of this leg was quite negative. The motor signs never amounted to paralysis, nor was there any wasting of the muscles, but the left knee jerk was diminished and the left cremasteris could not be elicited. There was no ataxia in heel to knee test.

He made a good recovery.

There have been two cases ascribed to this disease in the hospital in each of which there was hemiplegia associated with bloody cerebro-spinal fluid. Both of these cases were in healthy young girls, one of 16, the other 14 years old. In both search for other conditions which could cause such haemorrhage were negative. One of these cases had a right sided hemiplegia with transient aphasia, the other a left sided hemiplegia with sensory loss over the affected side. In both the hemiplegia was complete with hypertonus and pathological reflexes. This condition gradually improved so that when they left the hospital there was practically no paresis present in either case.

One of these cases showed slight optic neuritis more marked on the side of the central lesion.

The other case showed on one occasion bilateral clonic spasm of the facial muscles lasting two or three minutes. This was not accompanied by loss of consciousness but was apparently not recognized by the patient.

There has been one case of the disease apparently affecting principally the pontine region. This man after almost a month of digestive disturbance with vomiting and nausea, noticed burning sensation in the fingers and toes more marked on the right than the left side. He had headache but at no time showed abnormal drowsiness nor did he have any sensation of fever.

On admission three or four days after onset of weakness he showed paralysis of the left side of the face and paresis of the right side of the body. His tongue was protruded to the right. His blood pressure was 134 to 80. His glands were generally palpable and his spleen was palpable three finger breadths below the costal margin. He still had subjective sensation of tingling in the fingers and toes, but objectively there was no change. Both arms and legs showed marked general weakness and he was only able to walk with help and was ataxic. Ataxia was also present in the arms. At first Rhomberg could not be tested as he was unable to stand but later it was positive and he fell forward. His epigastric and abdominal reflexes were absent and also his knee jerks, but there were no positive abnormal reflexes. Later he developed diplopia and a weakness of the left external rectus was noted. Kernig's sign became positive, more marked on the right side. He developed slight nystagmus on looking to the left. He gradually recovered and left the hospital with only very slight signs of ataxia. His knee jerks were still diminished. His cerebro-spinal fluid never showed any increase

of cells and of the globulin tests the only one positive was Pandy.

Diagnosis was made on the history of gradual development of paresis and ataxia with practically complete recovery in the absence of any other cause discoverable for such an affection in the patient.

One man, aged 50, presented himself with complete paralysis of both facial nerves which had lead to marked conjunctivitis in both eyes. His face was completely mask like. The ears were examined and disclosed no cause for the facial paralysis. This paralysis had commenced about two weeks before admission. One month before admission he had had shooting pains in both legs and cramps in the soles of the feet and at about the same time he stated that he had had transitory diplopia. During his stay in the hospital at first the temperature was irregular, reaching 100 as the highest but usually reaching 99 every day until shortly before discharge. He showed some drowsiness but few general symptoms.

His abdominal epigastric, and cremasteric reflexes were absent at admission and there was a doubtful Oppenheim, but no other abnormal reflexes.

He made a practically complete recovery being in hospital about five weeks.

His cerebro-spinal fluid was not under pressure: it contained 41 cells per c.m.m. but globulin tests were negative. Wassermann was, of course, negative. There was no leucocytosis.

One patient, a woman of 28, was admitted in March, 1921, giving a long history and is apparently a chronic case.

The symptoms began rather acutely about fifteen months before admission. From that time she had been more or less ill, at times showing drowsiness, at others sleeplessness. Her movements had become slow as if her mind was on something else. She did not care to talk unless answering questions.

On admission she showed this mental sluggishness. Her pupils were inactive to light. Her abdominal reflexes were absent on the right side and there was a Babinski reflex on the left. She showed no improvement while in the hospital.

Two cases have shown the presence of glycosuria without the history of such condition being present before. However in one case there was a history that for two years he had suffered at times from blurred vision, headache, and a feeling of general weakness. These attacks would last for a varying period from a day to two weeks. In the intervals he felt well, but he had frequency of micturition and constipation with some itching of the skin during the two years.

About two weeks before admission he began to suffer from pains in the back of the head and in the shoulders, shooting in character and more or less constant. During the following week he noticed that he felt weak, was easily tired and had blurred vision. The headache was more or less constant and increasing and he was in bed for about a week before coming to the hospital. There was an *indefinite* history of diplopia as he stated that he only noticed it when he wore glasses. On admission he was very drowsy at first, but examination of the blood chemistry showed no evidence that this drowsiness was due to diabetic coma. In fact he was put on diabetic orders and the urine remained sugar free after the first day in the hospital, but examination of the blood showed delayed assimilation of, and diminished tolerance for, glucose.

Lumbar puncture showed the fluid under pressure with 19 cells to the cub. m.m. and Pandy test positive.

In the other case there were more definite signs of encephalitis. The onset was more acute. He became rather suddenly ill about twelve days before admission with pains all over the body and a chilly feeling. These symptoms caused him to go to bed the next day and stay there for two days. After that he had a day when he felt well and was able to work. The next day on awakening he had double vision. This persisted for two days but without headache, though he vomited once. Following the disappearance of the diplopia he noticed dimness of vision.

On admission he seemed heavy and drowsy with slow mental coordination, but no distress. His pupils were equal, small and active to light and accommodation. There was no weakness of any extra-ocular muscle. His tongue was thinly furred and his breath heavy. His blood pressure was 138 to 94.

On examination of the nervous system nothing abnormal was found in the cranial nerves except possibly the second in that he complained of blurring of vision, but the fundi were normal. There was no paralysis or paresis of any muscle found. The knee jerks were accentuated, and abdominal reflexes diminished. The right cre-

masteric was greater than the left. No pathological reflexes were found and there was no retraction of the head.

The next day he was more drowsy and some ptosis was noticed in both eyes. This increased on the next day and it was noticed that the right eye could be rolled up towards the forehead, but the left eye continued to look straight forward. No other paralysis or paresis was found.

He ran a rather acute course. He was irrational a good part of the time for about a month after admission but could be roused. Delirium was distinctly occupational in character. He had almost daily incontinence of urine and at times faeces.

Almost a month after admission he had three attacks in which he had spasm of all the muscles of the body but no opisthotonus. These attacks started with a cry and frothing at the mouth. His tongue was not bitten but in one he passed urine. He remained very drowsy and stuperose after these attacks but no pathological reflexes were present.

After this he gradually improved and he left the hospital about seven weeks after admission without symptoms.

His temperature was elevated for almost a month after admission usually reaching 101 to 102, but on one occasion reaching 103.4. It ended by slow lysis.

In this case sugar first appeared in the urine 16 days after admission when he was acutely ill and it persisted off and on for about eleven days.

From the absence of previous history pointing to diabetes and the occurrence of the sugar only late in the disease while other acute symptoms were present this was regarded as a case of glycosuria due to extension of the process into the fourth ventricle, while in the first case as there was a history of symptoms suggesting previous glycosuria it was considered that that case was one of encephalitis occurring in a man predisposed to diabetes.

These cases have been followed in the metabolic clinic of the hospital since discharge and their subsequent history confirms this view as the first case shows a persistence of diminished tolerance to glucose and delayed assimilation while in the second case these have practically become normal.

These cases are offered, not as presenting anything new, but simply as cases illustrating the complexity of the problem due to the divergence of the symptoms met with in this disease on account of its apparently greatly varying severity in different cases and also to the fact that different parts of the central nervous system are called on to bear the brunt of the infection in different cases.

No specific treatment was used in any of these cases so that the results can only be ascribed to symptomatic and expectant treatment.

I have to offer my thanks to the medical staff of the hospital, especially to Drs. F. G. Finley, H. A. Lafleur and A. H. Gordon, for permission freely given to use the records in cases under their care.

The American Public Health Association announces four phases of its semi-centennial celebrations to be held in New York City, November 8-18, 1921:

(a) *The Scientific Sessions* will be held November 14-18. There will be programs of the following sections: Laboratory, Vital Statistics, Public Health Administration, Sanitary Engineering, Industrial Hygiene, Food and Drugs. There will also be special programs on Child Hygiene and Health Education and Publicity.

(b) *Health Institute,* November 8-12. The purpose will be to show health functions in actual operation, especially those which may be duplicated in other cities. In one sense the Health Institute may be considered as a school of instruction in practical health administration.

(c) *Dr. Stephen Smith,* the founder and first president of the Association, who is now in his 99th year, will be the guest of honor at a banquet to celebrate his approaching centennial and the semi-centennial of the Association.

(d) *A Historical Jubilee Volume,* "Fifty Years of Public Health," will be published about October 1. While concentrating upon the public health of the last fifty years, the book will describe the earlier beginnings of public health in an introductory way, and may, therefore, be considered a general history of public health from the earliest days to the present.

Detailed announcements, programs, and information concerning special railroad rates will appear in the *American Journal of Public Health* and the *News Letter* of the Association from time to time or may be had upon addressing the Association at 370 Seventh Avenue, New York City.