EPIDEMIC MENINGITIS MINOR

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During the period from February 21st to April 8th of this year thirteen children suffering from symptoms of meningitis were admitted into the Children's Hospital of the Leicester Royal Infirmary. They presented a clinical picture similar to that described by Quinke¹ in 1893 under the name "serous meningitis," although the affection from which they suffered differed from this disease in several important particulars.

Sporadic cases of meningitis of the Quinke type are not uncommon. During the four years from 1927 to 1930, 35 were admitted into the Leicester Royal Infirmary. The age of the patients varied from 8 months to 64 years, although children were mostly affected, only two being over the age of 13 years. There were 24 males and 11 females; 4 died apparently from the condition itself, 13 from other concomitant diseases, chiefly broncho-pneumonia. But although this sporadic type is well recognized, there is no record of the affection assuming an epidemic character in this country. Recently Schneider² has reported an epidemic of serous meningitis, and he refers to several similar outbreaks in Germany. But here again the present series of cases do not present features entirely similar to those of the German epidemics, or to those admitted into this hospital during the previous four years.

SYMPTOMS AND PHYSICAL SIGNS

Eight of the cases now under consideration were secondary to broncho-pneumonia, usually of a mild type, the other five being apparently primary. The onset was sudden in seven, insidious in six. Vomiting, headache, and drowsiness were the most constant symptoms. Vomiting occurred in seven cases. Headache and drowsiness were complained of six times each; as five of the patients were under the age of 1 year, and abnormal crying was a symptom of these, headache is probably a constant complaint. Convulsions were reported in five cases. Diarrhoea was present in five patients, constipation in three. Two were delirious. Increased thirst was noticed twice. There was grinding of the teeth in one case. One patient complained of abdominal pain.

Nuchal rigidity was present in all thirteen patients, while eleven of them exhibited a positive Kernig sign. In all but one case the temperature was raised to a varying degree; in three cases it reached 104° F. There was bulging of the fontanelle when this was patent. Strabismus was strikingly absent. In the older children in whom the fundi oculorum were examined there was no papilloedema. In no case was there any evidence of disease of the middle ear.

CLINICAL COURSE

All the patients but one recovered. In the fatal case the patient recovered from the meningeal symptoms, but he had broncho-pneumonia and contracted diphtheria; he was apparently doing well when there was a recurrence of the broncho-pneumonia, from which he died.

In this and one other case lumbar puncture was not performed—the one was transferred to the isolation hospital and in the other the symptoms disappeared spontaneously within twenty-four hours of admission. The primary cases cleared up very shortly after lumbar

puncture, usually within twenty-four hours. As a rule there was a history of illness lasting from two days to one week before admission. In the secondary cases, the meningeal signs cleared up on lumbar puncture, while the broncho-pneumonia ran a short course of seven to sixteen days; in one case, however, the broncho-pneumonia persisted for six weeks.

THE CEREBRO-SPINAL FLUID

Cerebro-spinal fluid was obtained from eleven patients. In all cases it was under increased pressure, clear, and sterile. It did not form a coagulum on standing.

The protein was usually slightly increased. The average amount was 0.057 per cent.; three specimens had only 0.02 per cent., while one specimen showed a greatly increased protein content—0.2 per cent.

The cells in ten cases were under 5 per c.mm. In one case—that with the very high protein—they were increased to 40 per c.mm., and these were mostly lymphocytes.

The chlorides were estimated in nine cases, and the results were always within normal limits. The average was 712 mg. per 100 c.cm., the limits being 690 and 750 mg. per 100 c.cm.

Sugar was always present. The actual amount was only estimated in one case, when it was found to be 0.062 per cent.

TREATMENT

The only treatment given was lumbar or cisternal puncture. This resulted in a complete disappearance of all meningeal symptoms, usually after one operation. In two cases two punctures were necessary before resolution occurred.

ETIOLOGY

As has already been stated, five cases were primary and eight secondary to broncho-pneumonia. But while these last are termed "secondary," the meningeal symptoms all occurred at the onset of the disease, so that the two affections appeared concomitantly. The patients were usually sent in by outside doctors about the fourth or fifth day from the onset, with the diagnosis "broncho-pneumonia and meningitis."

Sex.—There was a marked preponderance of males in this small series—ten males to three females. With such a small number of cases this may or may not be of significance. It will be remembered that in the sporadic cases that have occurred in Leicester in the four previous years there were twenty-four males to eleven females.

Age.—The two youngest of our patients were 9 weeks old, the eldest 6 years. The ages of the other patients were 10 weeks, 6 months, 10 months, 14 months, 15 months (2), 3 years, 4 years (2), and 5 years.

Concomitant Epidemics.—The cases all occurred during or near March, 1931. During this time two mild epidemics were prevalent locally—cerebro-spinal meningitis and influenza. In no case was there a history of one of our patients having been exposed to these infections knowingly. No case had been admitted in 1931 before February 21st, and up to the time of writing (June) no case has been admitted since April 8th.

DISCUSSION

Undoubtedly this series of cases bears a strong resemblance to Quinke's serous meningitis. In his original description that author groups the cases as follows:

- I. Those with acute onset.
 - (a) With acute course.
 - (b) With chronic course.
- II. Chronic cases.
 - (a) With chronic progressive course.
 - (b) Chronic cases with acute exacerbations.

The cases described by us resemble most clearly those included in I (a)—cases with acute onset and acute course. This agrees well with Quinke's observation that

the younger the age at onset the more likely is the condition to be acute, as all our cases occurred in early childhood. Indeed, this constitutes one of the most striking points about this epidemic. Quincke stated that serous meningitis is mainly a disease of young adults, but that cases do occur in childhood. Of his six acute cases reported, three patients were 20 or more, one was 14, one $3\frac{1}{2}$, and one $1\frac{1}{2}$ years old. Another striking point of difference between the cases now under discussion and those described by Quincke is the shortness of the course. In our cases all meningeal symptoms cleared up in a few days after lumbar puncture. Quincke's acute cases lasted from four weeks to five months. Fever was marked in all but one of our patients, whereas it was absent or slight in Quincke's. Only one of the latter's—the youngest—suffered from broncho-pneumonia, whereas it was present in the majority of our patients.

Since Quincke's time the condition has been fairly well recognized, but little new has been added to our knowledge. A good modern description of the disease (now translated into English) is given by Ibrahim.³ The most important differences between the affection as described by him and the present series of cases are: (1) the frequency of otitis media as a point of origin; (2) the common occurrence of fatal cases (Ibrahim states that the more acute the onset the greater the mortality); (3) the formation of a fibrin clot in the fluid obtained by lumbar puncture; (4) the occasional growth of micro-organisms from the cerebro-spinal fluid (*B. influenzae*, *B. coli*, pneumococci, streptococci, or staphylococci); (5) the occurrence of tetany as a complication—of evil prognostic import.

The most recent account is that given by Schneider referred to above. The affection appears to be more or less endemic in Central Europe, with mild epidemic outbreaks. Although in previous German epidemics children were mostly affected, the youngest of Schneider's patients was 14 years old, the majority were middle-aged adults, and there was no marked preponderance of either sex. The cerebro-spinal fluid was sometimes opalescent, the cell count and protein both being increased. The author believes the disease to be an abortive form of cerebro-spinal meningitis.

It is interesting to note in this connexion that there was a mild epidemic of cerebro-spinal fever at the same time as the occurrence of our cases. However, in our opinion, the very frequent coincident broncho-pneumonia points rather to an influenzal infection being the cause—especially when it is remembered that there was also an influenza epidemic at the time. Lafora⁴ in 1922 expressed the opinion that influenza was a frequent cause of serous meningitis, and he reported a chronic case following influenza in a woman of 35, who was cured by repeated lumbar puncture. Indeed, it does not appear unreasonable to suppose that this form of meningitis may result from mild infections of various natures, influenza perhaps being the commonest; and we suggest that the name "meningitis minor" be applied to them to differentiate them from the infinitely graver suppurative or tuberculous forms. The name "serous meningitis," while it distinguishes them from the former, does not denote the profound way in which these mild cases differ from tuberculous meningitis. Dr. C. P. Symonds, in conversation with one of us (J. V. C. B.), pointed out the inaccuracy of the term "serous meningitis."

SUMMARY

1. Thirteen patients with symptoms of meningitis were admitted into hospital in six and a half weeks during the early spring of this year.

2. Eight of the thirteen had coincident broncho-pneumonia.

3. All the patients were young children; ten were boys.

4. The cerebro-spinal fluid was under pressure, clear, and sterile. The protein tended to be increased slightly, but usually there was no other abnormality.

5. Lumbar or cisternal puncture caused rapid and complete disappearance of the symptoms.

6. The condition may be an abortive form either of influenzal or cerebro-spinal meningitis. In the present cases it was probably the former.

7. The disease, while resembling that described by Quincke as serous meningitis, shows several important differences, particularly in its benign course. It is suggested that the name "meningitis minor" is preferable.

REFERENCES

- ¹ Quincke, H.: *Über Meningitis Serosa, Sammlung Klin. Vorträge*, Leipzig, May, 1893, lxvii, 655.
- ² Schneider, H.: *Wien. klin. Woch.*, March 13th, 1931, 350.
- ³ Ibrahim, J.: *Feer's Pediatrics*, translated by Sedgewick and Scherer, p. 474. Lippincott, 1922.
- ⁴ Lafora, G. R.: *Siglo Med.*, May, 1922, 540, 572.

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

POISONING FROM MOTOR CAR EXHAUST FUMES

In the last year two cases of poisoning from exhaust fumes have been observed. The cases were so very similar that a description of one only is thought necessary.

A removal agent came to see me one day in despair. He had seen two doctors in a month, and neither could help him. I was equally stumped by his symptoms, but hit upon the diagnosis by chance.

Since 1919, when he left the Army, in which he was a transport officer, this man had been employed by a firm of removal contractors, and worked twelve to fifteen hours a day. He had never had a holiday. His job is to go from Leeds to any town in England to arrange a removal. This he does by car.

Till the early part of last year he had no complaint, and enjoyed his work. In February he found himself much more easily tired than usual. His eyesight worried him at night. He gave the following example, which shows at the same time what a strenuous day's work he was in the habit of doing. One day he went to the office at 9 a.m., read his letters, and dictated replies. At 11 o'clock he motored to Manchester, arranged for a removal, and motored back, arriving at 5 p.m. After two hours in the office he had a meal, and set out by road for Newcastle-on-Tyne. He felt sleepy, and his eyes were heavy as he drove—"a most unusual state of affairs"—but he arrived there at 11 p.m., completed his business, and set off for home. In the early hours he noticed that the lights of approaching traffic seemed to flicker and flash. A little later he caught himself on the verge of falling asleep—a feeling he had never experienced before. He wisely pulled up, and slept for half an hour. He started again, but had great difficulty in driving, because he could not place lights correctly on the road. He would see the light of a house, but it would be so unsteady that he could not determine on which side of the road the house lay. Several times he stopped, overpowered with sleep, but eventually he reached home. A few hours in bed restored him to a feeling of comparative freshness, but when he got into his car the feeling of helplessness overcame him. The climax arrived one day when he stopped at a robot. For ten minutes he tried to decide when the light was green and when red. He could see the change in colour, but he could not remember which colour stood for safety and which for danger. He thereupon hired a chauffeur, but he got no better. He was under medical treatment, and was having more rest than usual.