CASE REPORTS

THREE CASES OF NON-BACTERIAL MENINGITIS

BY

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Although many cases of acute aseptic or non-bacterial meningitis have now been described the etiology of the condition remains obscure. The following three cases have been observed during the last eighteen months. In all three the cerebro-spinal fluid remained sterile on culture and no organisms were seen in the direct films. In none of the cases was there any suggestion of middle-ear disease or sinus infection which might have caused a serous meningitis. All three made a complete recovery. It is suggested that the second and third cases may bear a different etiological interpretation from the first case.

Case records

Case 1. A female child aged four years was admitted to hospital on 24.8.35 with a history of having been off colour for four days. Vomiting had occurred on the first day and since then she had been lackadaisical and drowsy. On examination it was found that the child was drowsy, had a peevish cry and showed a disinclination to raise herself from the supine posture. All the tendon reflexes were diminished, the abdominal reflexes were not elicited and the plantar responses were flexor.

The following day there was some neck rigidity and slight spasm of the hamstring muscles. Lumbar puncture yielded clear fluid under pressure which showed an increase in cells and protein and a diminution in chlorides. The following day neck rigidity was marked and Kernig's and Brudzinski's signs positive. These meningitic signs persisted until 11.9.35, becoming less definite as time went on. Throughout the child was afebrile apart from an occasional rise of temperature to 99° F. which could be attributed to severe constipation.

The changes in the cerebro-spinal fluid are shown in table 1 A.

Case 2. A female child aged two years was admitted to hospital on 13.12.36 with a history of having been 'miserable, listless and crying for two days.' She had been holding her head a good deal and seemed to like resting it on a chair or bed. On the day of admission she had been vomiting

everything. For half an hour prior to admission the left side of her face had been twitching. Examined on admission the child was seen to be very ill and was having Jacksonian convulsions affecting the left side of the face, left leg and left arm.

Lumbar puncture, performed immediately, yielded a clear fluid under slight pressure. About 15 c.c. were run off after which the convulsions gradually became weaker, more discrete and finally ceased. The temperature on admission was 99.4° F., the pulse 150. On 14.12.36 the child was quiet, listless and pale. Two minor fits had occurred during the night. The temperature was 100.8° F., pulse 140 and respiration rate 24. Apart from slight neck rigidity there were no signs in the central nervous system. The report on the cerebro-spinal fluid showed a high proportion of lymphocytes, an increase in protein and a low chloride content. On these grounds a tentative diagnosis of tuberculous meningitis was made with a grave prognosis.

During the succeeding four days the signs of meningitis become more definite. The temperature remained above 99° F., the child resented being touched, neck rigidity became marked and Kernig's and Brudzinski's signs were positive. A second lumbar puncture on 18.12.36 showed a decrease in cells and a return to normal on the part of the chlorides. Thereafter the clinical condition began to improve slowly, temperature fell to normal, the child became a little brighter and her appetite improved. The changes in the cerebro-spinal fluid are shown in table 1 B. Meningitic signs persisted until 10.1.37, or four weeks after admission during which time she continued to have slight elevations of temperature. Throughout this period her mentality was remarkably dull for a child of her age. She did not attempt to speak at all and appeared to require re-education in simple actions such as feeding herself, playing with toys, etc. For several days she had to be told who her parents were as she failed to recognize them.

Case 3. A girl aged thirteen years was admitted to hospital on 8.1.37 with a history of headache and an attack of shivering on the previous afternoon. She had vomited the preceding night and twice on the day of admission. For three hours before admission she had been feverish and delirious. Examined on admission she was found to be very ill, pale and drowsy. The temperature was 99° F., pulse 100 and respiration rate 18. The only positive signs on examination were slight, generalized abdominal tenderness, marked neck rigidity and positive Kernig's and Brudzinski's signs. Lumbar puncture was performed forthwith and the cerebro-spinal fluid was found to be turbid and under pressure. On 9.1.37 the child seemed brighter and the meningitic signs, although still present, were less marked. As the first specimen of fluid had shown masses of polymorphonuclear cells, increased protein content and absence of sugar, a tentative diagnosis of meningococcal meningitis was made, although no organisms had been seen. Accordingly a further 20 c.c. of turbid cerebro-spinal fluid under pressure were run off and 15 c.c. of anti-meningococcus serum administered intrathecally while 10 c.c. were injected intramuscularly. This procedure was repeated on 11.1.37 and had the effect of producing a severe serum rash two days later, but could not be considered otherwise to have affected the course of the disease. Subsequent changes in the cerebro-spinal fluid are shown in table 1 C. The temperature fell by lysis, reaching normal on 17.1.37. The meningitic signs cleared gradually, having all disappeared by 22.1.37, exactly two weeks from the onset of the illness.

TABLE 1.

	DATE	PRESSURE	COLOUR	CELLS PER C.MM.	POLY- MORPHS PER CENT.	LYMPHO- CYTES PER CENT.	PROTEIN MGM. PER CENT.	GLOBULIN	SUGAR MGM. PER CENT.	CHLORIDES MGM. PER. CENT.
A	27.8.35	+	Clear	15	0	100	80	+	58	680
	29.8.35	+	Opaque	230	5	95	100	+	61	660
	5.9.35	±	Clear	20	5	95	100	±	60	706
	9.9.35	Not +	Clear	4	0	100	50	+	70	706
B	13.12.36	+	Clear	87	14	86	40	0	95	680
	18.12.36	+	Clear	70	2	98	60	+	91	720
	5.1.37	Not +	Tinged with blood. (Trau- matic)	16	10	90	50	+	50	766
C	8.1.37	+	Turbid	masses	of poly	morphs	250	++	0	648
	12.1.37	+	Opaque	400	95	5	45	+	55	720
	15.1.37	240 mm. of water	Clear	68	85	15	30	±	54	700
	23.1.37	170 mm. of water	Clear	6	0	100	20	0	74	780

Discussion

Case 1 occurring in the late summer, is fairly typical of acute aseptic meningitis as described by several observers. In case 2, while the cell picture is fairly typical of acute aseptic meningitis, the onset with Jacksonian convulsions is uncommon, although some cases with convulsions have been described in very young children. The mental apathy after the acute stage of the illness had subsided, and the apparent amnesia for simple actions recently learned are also unusual, and somewhat suggestive of an encephalitis, although eventually they cleared up completely. The interesting feature of case 3 is the high original protein content of the cerebro-spinal fluid and the persistent preponderance of polymorphonuclear cells. Several cases have been described in which the cells were at first chiefly polymorphs and later replaced by lymphocytes, but this change usually occurs at an early stage of the disease. In this case the illness had practically run its course before any change took place. In both the second and third cases the onset was more sudden and severe than in the first case and the children were more seriously ill during the first few days. The meningitic signs and cytological changes also persisted for rather longer than is usual in acute

aseptic meningitis. The first case occurred in the summer the second and third in mid-winter at the height of an influenzal epidemic. At this time scores of other children from the same district were seen with influenzal broncho-pneumonia and the appearance of these two cases at such a time suggests that they were possibly neurotropic or meningotropic manifestations of the influenza virus. It would be interesting to know if other cases of a similar nature were observed at this time.

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