

CASE REPORTS

ENCEPHALO-MENINGITIS DUE TO PNEUMOCOCCUS TYPE 1

BY

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Cases of acute meningitis associated with encephalitis have been described by Banks and McCartney (1942). In their series of ten cases there was one recovery; in the remaining nine cases the distinctive clinical picture was confirmed by the post-mortem findings. The following case of primary pneumococcal meningitis resembles the cases described by Banks and McCartney so closely clinically that it seems reasonable to make the diagnosis of encephalomeningitis, although as the child recovered definite confirmation is lacking.

Case history

G.R., male, aged 4 years 11 months, was admitted on 2/1/43 at 1 p.m. in a semi-conscious condition. The illness had started on the night of December 29-30 when the child became delirious. The following day he was feverish, and the day after this complained of left-sided earache. The mother stated that there was redness and swelling of the left lower eyelid spreading to the nose and that there was photophobia. On the day before admission swelling of the eyelid had disappeared, but the child complained of pain in the neck. On the day of admission he had been noticed to be unduly quiet, and to 'tremble' when moved. He had not vomited at all, but had been constipated throughout the illness.

Condition on admission. T. 104.8° F.; P. 136; R. 40. The child was pale, semi-comatose, with slight head retraction and a meningeal stare. There were no petechiae on the body and nothing abnormal was found in the cardio-vascular system, respiratory system, abdomen, ears, or throat. There was marked stiffness of the neck with positive Kernig's sign. The pupils were dilated, the tendon reflexes normal; plantar responses were flexor and the abdominal reflexes were present. A lumbar puncture was performed. The fluid was under pressure and faintly turbid. The turbidity was due to enormous numbers of pneumococci (see table). Treatment was started immediately with sulphapyridine, 1 gm. four-hourly by mouth. He received 5.5 gm. of sulphapyridine in the first 24 hours (for details, see table).

Progress. The temperature fell gradually to normal at 10 a.m. on 4/1/43; the pulse, however, remained high and there was no corresponding clinical improvement. The child was more deeply comatose than on admission, and there was extreme restlessness which was not controlled by lumbar

puncture, nepenthe 5 minims or paraldehyde in 60-minim doses by mouth. During the day the temperature rose to 104° F., pulse 190. Nasal feeding became necessary and sulphapyridine had to be given by intramuscular injection, 1 gm. four-hourly. In the cerebrospinal fluid obtained on this day relatively few pneumococci were seen (for details, see table).

On 5/1/43, though restlessness was controlled with a big dose of paraldehyde, 120 minims by mouth, there was no improvement. Coma was profound. The temperature reached its highest peak, 105.4° F. with uncountable pulse that evening, and the child had a generalized convulsion. Lumbar puncture was carried out at 12 noon and 9 p.m. with the idea of relieving pressure. In each specimen of cerebrospinal fluid only a few intracellular pneumococci were seen and cultures were sterile.

The child's condition was so bad that it was decided to give no injections of sulphapyridine during the night, and after one further dose at 10 a.m. on 6/1/43 it was discontinued altogether. He had been given 19.5 gm. in 92 hours (for details, see table). On 6/1/43 the child appeared moribund, T. 104° F., R. 90 and stertorous, pulse uncountable. The abdomen was distended, the face sunken, grey and cyanosed. There was conjunctivitis and iritis of the left eye and the left pupil was smaller than the right. It was felt that his condition was now hopeless. However, during the afternoon he began to improve. By the evening the abdominal distension had disappeared, his temperature was only 100.4° F., pulse 160, respirations 40, quiet and regular. From then onwards his progress was steady, though very slow. Lumbar puncture done that evening showed a normal pressure of 100-120 mm. water. The fluid was again sterile and for the first time no organisms were seen in direct smear. On 7/1/43, though comatose, he responded slightly to stimulation. By the evening of 8/1/43 he was conscious and able to drink from a spoon. He had been in coma for six days.

He continued to run an irregular temperature until 13/1/43 when it settled to a base line of about 100° F., becoming normal in another week. On 10/1/43 he was noticed to have left facial weakness and his left pupil was larger than the right. On 17/1/43 weakness of the left sixth nerve (internal strabismus) was noted. His tendon reflexes and cutaneous reflexes were normal except that both knee-jerks were absent and remained so. He did not begin to talk until 20/1/43—up till that time he said only 'Mummie' and signified 'Yes' and 'No' by nodding and shaking his head. About 22/1/43

Date	Grammes of sulphapyridine	Cerebrospinal fluid			Blood count		Level of sulphapyridine mgm. per cent.		Urine	Condition of patient
		Cells, per c.mm.	Organisms	Cultures	W.B.C., per c.mm.	Hb per cent.	Blood	C.S.F.		
2.1.43	3	200 P=80 per cent.	Pneumococci in enormous numbers	Profuse growth of pneumococci						Semi-comatose
3.1.43	5.5									Comatose
4.1.43	6	1100	Relatively small nos.		27,000	78	10	6		Comatose; nasal feeds started. Fluid intake, 8 a.m.-8 p.m., 4 oz.
5.1.43	4	500	Small nos. intracellular	Sterile				12 a.m.: 12 9 p.m.: 20		Comatose
6.1.43	1	850 P=30 per cent. L=60 per cent.	None	Sterile	36,000		35	24	Alb. ++ Sulphonamide crystals	Apparently moribund
7.1.43					28,000	74	Noon: 22 9 p.m.: 6			Better: taking by mouth in evening
8.1.43									Hyaline and granular casts; many crystals	Conscious
11.1.43					24,500 P=90 per cent.					Left 7th nerve palsy; left pupil larger than right
12.1.43									Alb. trace. No casts or crystals	Temperature settled
15.1.43					11,000 P=81 per cent.					Left 6th nerve palsy.
9.2.43		8	N.I	Sterile						Absent knee-jerks. Left pupil larger than right. Left 6th and 7th normal. Deaf in both ears. Sitting up

he complained of difficulty in hearing, particularly in his left ear, and by 1/2/43 was completely deaf. He made no attempt to sit up until 6/2/43, and even then seemed to have great difficulty in holding up his head. By the time he was discharged on 13/3/43 he was up and walking a few steps, his squint and facial weakness had completely disappeared and his pupils were equal. The knee-jerks were still absent. He had complete bilateral eighth nerve deafness which seems to be permanent. His intelligence appeared rather above average for his age, although in the last few weeks he had spoken progressively less.

Otologist's report. Does not respond to loud sounds. No definite palatal sound in voice which might be expected in early stage of cochlear deafness. No after-nystagmus noticed on syringing ears with water at 80° F. suggesting absence of vestibular function. Probability that neuro-labyrinthitis has left him with no function in either labyrinth.

When seen in out-patients on 8/4/43 he was well but completely deaf. He still had absent knee-jerks, but no other neurological signs.

Discussion

The most striking clinical feature in this case was the profound coma associated with high temperature and rapid stertorous breathing coming on after initial improvement, and when the meningitis as judged by the cerebrospinal fluid was already beginning to respond to sulphonamide. The coma lasted for six days and was complete.

Recovery was very slow, but no Parkinsonian symptoms, such as occurred in the case described by Banks and McCartney, were noted. Various neurological signs, however, developed. Irregular pupils were already noticed during the stage of coma, left seventh nerve weakness, left sixth nerve

palsy, and left, then right eighth nerve deafness came on in that order after return to consciousness. The knee-jerks were also lost, which suggests the possibility of focal myelitis as well as encephalitis.

All the neurological signs subsequently disappeared except the bilateral eighth nerve deafness and loss of knee-jerks, which appear to be permanent.

A further point of interest is the erratic response to sulphapyridine :—

The total amount of sulphapyridine given was 19.5 gm. in four days, which is rather less than the doses recommended by Banks (1939) for meningococcal meningitis. Banks found the sulphapyridine levels in the blood after 24 hours to be between 4.3 and 12.1 mgm. per 100 c.c. with an average figure of 7.9 mgm. per 100 c.c. In this case the blood level was 10 mgm. per 100 c.c. on the third day of treatment and rose to a maximum of 35 mgm. per 100 c.c. in the blood and 24 mgm. per 100 c.c. in the cerebrospinal fluid on the fifth day. Apart from cyanosis and the transient appearance of albumen, red blood cells and casts in the urine no toxic effects were noted which could be ascribed to the high concentration of sulphapyridine in blood and cerebrospinal fluid.

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