Medical Memorandum

Poliomyelitis Neonatorum with Respiratory Paralysis

It was Falk (1897) who recorded the first case of paralytic poliomyelitis neonatorum, in an infant 15 days old.

In Britain Gunewardene (1918) reported a widely distributed paralysis occurring in an infant aged 12 days who recovered completely. It was not until 30 years later that neonatal poliomyelitis was again recorded; this time the child becoming drowsy at the age of 4 days, paralysis being established at 11 days (Johns, 1948). In 1950, when a detailed age analysis of cases occurring in England and Wales was introduced, there were four deaths amongst five cases of poliomyelitis notified in the first month of life (80% mortality). During 1951 there were no such neonatal deaths, and in 1952 there were four deaths, three of which occurred in a private home of 13 beds (Sims-Roberts and Thomson, 1953).

In America the literature has been very comprehensive. Talbott Bates (1955) reviewed the literature on poliomyelitis occurring in infants under 1 month of age. He quoted 58 cases, including one he then reported in an infant 40 hours old, which appeared to be the youngest reported in an infant well at birth. Among these 58 cases there were 21 deaths, and eight of the patients who had died had had "anorexia" or "dysphagia," there being no indication of the proportion who had respiratory paralysis.

I have previously reported poliomyelitis neonatorum in an infant aged 10 days (McMath, 1955). Owing to the scarcity of literature upon respiratory paralysis in poliomyelitis neonatorum, the following case is worthy of record.

CASE REPORT

A male infant born on August 19, 1957, was admitted to Neasden Hospital on September 17 with the following history. When aged 17 days he had an infection of the upper respiratory tract and was irritable for the next 10 days. On the 26th day of life his upper limbs and legs became weak, and three days later he was admitted to a

hospital, where his breathing deteriorated and he was having attacks of cyanosis. He had received no injections.

Upon transfer to Neasden Hospital the infant was limp like a "rag doll," with gross paralysis of muscles of the upper limbs, neck, trunk, and, to a less degree, the lower limbs, with no spontaneous movements. Diaphragmatic movement was minimal, whilst there was weakness and inequality of intercostal breath-

ing. His temperature was 98° F. (36.7° C.), pulse rate 158, respiration rate 60. He had a feeble cry and was cyanosed; nor could he feed, insertion of a naso-gastric tube being necessary.

The infant was placed in a cabinet respirator (see Fig.) of the "alligator" type (rate 40 per minute, pressure -10, +0 cm. of water). This corrected the cyanosis. Two days later the respirations synchronized at a rate of 26 per minute with pressures -7, +1 cm. After three days the respirator was able to be opened for five minutes and the following day for 10 minutes hourly.

The infant was gradually weaned from the respirator, and after 14 days his breathing was adequate enough to dispense with it. From this time onwards the severe orthopaedic defects of the upper limbs and trunk were dealt with in the usual manner until his discharge from hospital to the care of an orthopaedic surgeon on November 9.

Diagnostic Procedures.—The patient's cerebrospinal fluid was typical of poliomyelitis, there being 75 white cells per c.mm., and protein 75 mg. per 100 ml. Monkey-cell culture grew poliomyelitis virus type III. HeLa cell culture of the faeces of his brother (aged 23 months) also grew poliomyelitis virus type III, whilst the stools of the parents were negative. This is attributed to the large amount of lymphoid tissue in the child's gut.

COMMENT

Schaeffer and his colleagues (1954) were the first to demonstrate poliomyelitis virus (type I) in the placenta and the aborted foetus of a mother suffering from poliomyelitis: from which they concluded that infection occurred during the viraemic phase in the mother.

Biermann and Piszczek (1944) and Swarts and Kercher (1954) report that neonatal infection can occur orally in the infant at birth from maternal faecal infection or during caesarean section from maternal viraemia, there having been no contact with the mother after delivery or caesarean section.

Most cases of poliomyelitis neonatorum develop after the sixth day of life, from which it would seem that infection, when it occurs, is usually contracted after birth.

In the above case the baby was born healthy on August 19. On August 20 a sibling at home (aged 23 months) developed an infection of the upper respiratory tract with "running nose," cough, and diarrhoea. On the following day the father had an infection of the upper respiratory tract. Both the father and the sibling visited the mother and baby in hospital during the puerperium.

On September 4 the mother developed an infection of the upper respiratory tract, and on the next day the baby (patient) developed an infection of the upper respiratory tract.

Although type III virus was isolated from both the patient's and the sibling's stools, it is impossible to be dogmatic about from whom the baby contracted his infection.

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REFERENCES

- Bates, T. (1955). *Amer. J. Dis. Child.*, **90**, 189.
Biermann, A. H., and Piszczek, E. A. (1944). *J. Amer. med. Ass.*, **124**, 296.
Falk, O. (1897). *Allg. Wien. med. Z.*, **42**, 489.
Gunewardene, T. N. (1918). *Lancet*, **2**, 847.
Johns, A. W. (1948). *Med. Offr.*, **80**, 230.
McMath, W. F. T. (1955). *Lancet*, **1**, 651.
Schaeffer, M., Fox, M. J., and Li, C. P. (1954). *J. Amer. med. Ass.*, **155**, 248.
Sims-Roberts, J. T. C., and Thomson, D. (1953). *Monthly Bull. Minist. Hlth Lab. Serv.*, **12**, 152.
Swarts, C. L., and Kercher, E. F. (1954). *Pediatrics*, **14**, 235.

The rubber collar (diaphragm) of the baby respirator is placed in the axillae, so enabling the upper limbs to be free for physiotherapy. Photograph by G. A. Booker.