rare in mumps in young children, though in older boys its incidence runs between 5 and 15%, averages 18% after puberty (Wesselhoeft, 1940), and is bilateral in one-third of the cases (Brennemann, 1949). Most cases of epididymo-orchitis appear between the first and the eighth day of mumps, and the acute swelling subsides in four or five days. Atrophy often follows.

Morrison and Baird (1952) describe the incidence of orchitis in Bornholm disease in this country, and quote Jamieson and Prinsley (1947) as reporting it to be the commonest complication of an outbreak of the disease in Aden, and also Huss (1934) as stating that orchitis affected 50 out of 884 cases of Bornholm disease in the Swedish epidemic of 1931.

Though Sabrazés (1927) states that orchitis is a frequent complication of smallpox and vaccination, it has been rare in the limited outbreaks in this country during the past 30 years. Both this author and Wesselhoeft and Pearson refer to the work of Rivers (1926, 1927), who, using tissues from human varicella lesions, was able to produce inclusion bodies by injection into the testicles of monkeys.

I have to thank Dr. M. F. Hope, of Andover, for giving me access to his excellent notes on this case.

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Friedländer's Bacillus Meningitis, with Recovery

Meningitis due to Friedländer's bacillus (*Klebsiella pneumoniae*) is comparatively rare. Until the advent of the sulphonamides recovery was seldom reported (Hyde and Hyde, 1948). With combined sulphonamides and antibiotics more recoveries have occurred, but the mortality is still very high (Sadusk *et al.*, 1949). It was felt, therefore, that it would be of interest to report a case with a successful outcome.

CASE REPORT

The patient a 5 year-old girl, whose birth and development had been normal, had had no serious illnesses. She was admitted to hospital on December 28, 1949, with the history that two weeks previously she had developed a "cold in the head," with nasal catarrh. Eight days later she complained of pain in the left ear, and the next day she lost her appetite and became lethargic. She then became feverish and fretful; she vomited and was delirious at times, but on the day before admission she improved a little.

On admission she was quiet and rather drowsy, but co-operative. Her temperature was 100° F. (37.8° C.), pulse 96, and respirations 24. Her respiratory and cardiovascular systems were normal. The fauces were diffusely injected, and examination of the left ear showed that the tympanic membrane was red and bulging. The right ear was normal. There were palpable non-tender glands in the left posterior triangle of the neck. The liver edge was palpable below the costal margin and the bladder was distended to 2 in. (5 cm.) above the symphysis pubis. Neck rigidity was marked and Kernig's sign moderately positive. There were no other abnormal signs in the central nervous system, all reflexes being normal and equal and the plantar responses flexor. Examination of the urine showed no abnormality.

A clinical diagnosis of left otitis media with a complicating pyogenic meningitis was made. Lumbar puncture revealed a hazy cerebrospinal fluid under increased pressure; 5,000 units of penicillin was at once injected intrathecally. A left myringotomy was performed immediately after the lumbar

puncture and only a small bead of yellow pus was found: unfortunately, no swab of the pus was obtained for culture.

Examination of the cerebrospinal fluid showed that there were 528 cells per c.mm., almost all polymorphs, and in the film large numbers of encapsulated Gram-negative bacilli were seen. The protein was 40 mg., sugar 50 mg., and chlorides 705 mg. per 100 ml. A blood count showed: haemoglobin, 69% (10.35 g.%); white cells 4,200 per c.mm. (polymorphs 68%, lymphocytes 24%, monocytes 6%, eosinophils 2%). While awaiting information on the identity of the organism treatment was begun with sulphadiazine orally, 1 g. as a loading dose, then 0.5 g. every three hours, and penicillin 100,000 units intramuscularly every three hours.

On the following day the cerebrospinal fluid pressure was 170 mm., the fluid was still hazy, and occasional Gram-negative bacilli were still present in the stained films. A preliminary report was then received from the laboratory stating that the organism was probably Friedländer's bacillus, and so streptomycin was given, intrathecally 70 mg. daily, and intramuscularly 700 mg. daily, in divided doses. The intramuscular penicillin was also continued. The culture of the cerebrospinal fluid remained positive on the second and third days after admission, but only occasional organisms were seen in the stained films on the third day; on the fourth day and subsequently no organisms were seen in the smear and the cultures were sterile. By the fourth day bacteriological examination confirmed that the organism was Friedländer's bacillus, which was sensitive to sulphadiazine at a concentration of 2.5 mg. per ml., to penicillin at a concentration of 1 unit per ml., and to streptomycin at a concentration of 10 units per ml. Because of this comparative lack of sensitivity to streptomycin it was decided to continue treatment with sulphadiazine and penicillin alone, and thereafter penicillin was also given intrathecally in doses of 20,000 units once daily.

By the fifth day the child's general condition had improved and the pyrexia was settling. The incision in the left tympanic membrane closed within 24 hours and the ear remained dry subsequently. Neck stiffness disappeared on the sixth day, and at that time and afterwards no abnormal physical signs could be detected. Treatment was continued for a week after the C.S.F. culture had become sterile.

Convalescence was complicated only by a mild upper respiratory infection, and the patient was discharged on January 27, 1950, after 30 days in hospital. She then felt quite well, was mentally normal, and there were no abnormal physical signs; the cerebrospinal fluid was normal and under normal pressure. One month later she was found to be quite well.

COMMENT

The patient never seemed to be severely ill, and the fact that the cerebrospinal fluid sugar content was not decreased, the chlorides were within normal limits, and the protein was only slightly raised suggested a mild infection. However, this was not borne out by the presence of large numbers of organisms seen in the first stained film and the finding of positive C.S.F. cultures for the first three days. Because of the latter findings, and owing to the uncertain response of Friedländer's bacillus to antibiotics, it was decided to use available therapeutic agents in high dosage and to continue treatment for at least a week after the organisms had disappeared from the cerebrospinal fluid. This programme seems to have been justified by the excellent result. Although it cannot be claimed that sulphadiazine and penicillin alone effected the cure, because streptomycin was given for two days near the beginning of treatment, it is highly probable that they were the effective therapeutic agents.

I should like to thank Dr. R. H. Dobbs, under whose care this patient was admitted, for permission to publish this report and for his advice in its preparation.

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