CANICOLA FEVER WITH NEUROLOGICAL COMPLICATIONS

BY

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Infection with *Leptospira canicola* is widespread among dogs in Great Britain, and the surveys of Stuart (1946) and Broom and MacIntyre (1948) provided serological evidence that up to 40% are infected during their life-time. Proved infections in man, however, are not common, and the known incidence quoted by Alston (1951) was 25 and 33 cases in 1949 and 1950 respectively. Although MacKay-Dick and Watts (1949) stressed that recognized cases are by no means always mild, the patient usually recovers completely. Only two deaths, both the result of renal involvement, have been reported—by Weetch *et al.* (1949) and Wolff *et al.* (1951).

Campbell *et al.* (1950) suggested that ocular and nervous symptoms occur more frequently in canicola fever than in Weil's disease. The only sequela they noted, however, was iridocyclitis in two of their six cases. The neurological complications of the leptospiroses were reviewed by Scheid (1949), and these included sub-arachnoid haemorrhage; paralysis of the palatal, facial, and oculo-motor nerves; brachial and sciatic neuritis; transverse myelitis; and paralytic bulbar forms akin to poliomyelitis. van Thiel (1948) noted in addition encephalomyelitis and peripheral neuritis. He considered that the prognosis for the meningitis is good, and that the various neuritides eventually end in recovery despite a somewhat protracted course. These reports, however, mainly concern Weil's disease, and neurological complications do not appear to have been a feature of canicola fever. The following case is therefore of interest in that infection with *L. canicola* was followed by a cervical radiculitis.

Case Report

A man aged 42 was admitted to hospital on June 29, 1953. He had been in good health until eight days previously, when he noticed a tightness in the chest which was increased by deep breathing. Two days later he developed a severe retro-orbital headache with photophobia, and these symptoms persisted. A week before he became ill he had purchased a young puppy. The animal had discharging eyes, and later developed frequency of micturition and weakness of the hind legs. He had nursed it himself and treated its eyes with ointment obtained from a chemist. It had improved by the time he himself became ill.

Examination on admission on the ninth day of his illness revealed a temperature of 100.6° F. (38.1° C.), but no tachycardia or tachypnoea. He was not seriously ill, but had slight photophobia and neck stiffness. Both conjunctivae were injected and there was a scanty morbilliform rash on his body. There were no other abnormal clinical findings.

Investigations.—Lumbar puncture: initial pressure 170 mm., with free rise and fall on jugular compression. Cerebrospinal fluid: slightly turbid; 500 cells per c.mm. (95% lymphocytes); protein, 120 mg. per 100 ml.; a slight excess of globulin; chlorides, 770 mg. per 100 ml.; glucose, 60 mg. per 100 ml.; no acid-alcohol-fast bacilli or other organisms seen in direct film; culture sterile in 24 hours. Blood count: 6,000 leucocytes per c.mm. (polymorphs 51%, monocytes 10%, lymphocytes 35%, eosinophils 3%, basophils 1%); haemoglobin, 93% (13.7 g.); E.S.R., 47 mm. in the first hour (Westergren). Urine: no albumin, no red cells or casts in centrifuged deposit, culture sterile.

On the tenth day his condition was unchanged except that he had developed loose watery stools. His temperature was intermittent and reached 101° F. (38.3° C.). A radiograph of the chest was normal. He was given chlortetracycline, 1 g. orally six-hourly, together with vitamin B complex.

On the twelfth day his diarrhoea and other symptoms had subsided, and the meningism, rash, and conjunctivitis had almost gone. His temperature was normal, and remained so. The chlortetracycline was reduced to 0.5 g. six-hourly.

Thereafter he made an uninterrupted recovery. The cerebrospinal fluid was normal on the twenty-first day and he was discharged home well on the twenty-third day. He had received 23.5 g. of chlortetracycline in 11 days.

The results of further laboratory investigations were: cultures of urine and faeces: no salmonellae or shigellae isolated. Serum agglutinations to salmonellae: anamnestic rise and fall in *Salm. typhi* O and H titres; Vi < 1/5. Serum leptospiral agglutinations were as follows:

Day of Illness	<i>L. canicola</i>	<i>L. icterohaemorrhagiae</i>
13	+ (partial) to at least 1/3,000	+ (partial) to at least 1/3,000
20	+ (partial) 1/3,000 — 1/10,000	+ (partial) 1/1,000 Trace 1/3,000 — 1/10,000

Absorption tests showed clear evidence of infection with *L. canicola*.

On July 4 the puppy was examined by a veterinary surgeon. He reported that it was well apart from a mild conjunctivitis which could be due to one of the virus diseases of the distemper group endemic in the area. The animal's blood, however, showed the following titres:

<i>L. canicola</i>	<i>L. icterohaemorrhagiae</i>
+ 1/30,000 Trace 1/100,000 — 1/300,000	+ (partial) 1/10 — 1/30

The patient was seen in the out-patient department on August 18. He was well, but said that one week after discharge from hospital he had noticed "an aching over the shoulders." This was quickly followed by weakness of the right shoulder muscles and inability to raise the arm above the shoulder. At the same time he had had a sensation "like sunburn" over the outer aspect of the left forearm, and weakness of the left thumb.

Examination showed a paralysed right serratus anterior with winging of the scapula, and slight weakness of the left thumb, particularly of extension and abduction. No other objective findings were present in the central nervous system or elsewhere. Electrical stimulation of the nerve to the right serratus anterior produced no muscular response, but stimulation of the left thumb muscles caused a normal but reduced response.

Physiotherapy was started, and on September 21 the thumb had recovered, but the serratus anterior was still paralysed. He could now raise the right arm, however, as a result of hypertrophy of the other shoulder muscles and trick movements.

On December 28 his clinical condition was unchanged; the serratus anterior remained paralysed. A repeat radiograph and screening of the chest, however, showed a partially paralysed right diaphragm without apparent cause in the chest. This indicated for the first time that the right phrenic nerve was also involved. By September, 1954, 18 months after the onset of his illness, there had been considerable recovery of both the serratus anterior and the diaphragm.

Comments

The neurological signs and symptoms in this case pointed to bilateral patchy involvement of either the cervical segments of the spinal cord or its roots or nerves, and the

clinical picture resembled very closely the shoulder-girdle syndrome or neuralgic amyotrophy described by Parsonage and Aldren Turner (1948). They reviewed the previous sporadic reports of this syndrome and recorded 136 cases which had occurred after war injuries, operations, and infections; Miller and Stanton (1954) also reviewed similar complications following prophylactic inoculation.

The close similarity between the shoulder-girdle syndrome and the occasional consequences of inoculation perhaps point to a common cause. Miller and Stanton (1954) suggested that inoculations produce an anaphylactic hypersensitivity reaction which in turn gives rise to axon swelling and polyradiculitis. The restriction of the clinical features to the brachial plexus would appear to depend upon anatomical factors, the swollen roots in this region being more easily compressed by the dura or in the intervertebral foramina.

In this case injury was not responsible for the muscular paralysis. To postulate a virus infection as the cause involves considering a dual aetiology. Injection therapy was never used, and the only drugs given were chlortetracycline, barbiturates, and compound codeine tablets. It seems reasonable, therefore, to presume that infection with *L. canicola* gave rise to an antigen-antibody reaction which presented as the shoulder-girdle syndrome.

The dog subsequently died of hard pad, and none of its other human contacts developed clinical canicola fever.

Summary

A case of canicola fever is described; the infection was contracted from a pet dog. Initial recovery was complete after treatment with chlortetracycline, but convalescence was complicated by a cervical radiculitis. The right serratus anterior and right diaphragm were paralysed and there was transient paresis of the left thumb. Initial subjective sensory changes over the left forearm were also present. Recovery was finally complete 18 months after the onset of the illness.

A review of the literature shows that, whereas neurological symptoms are frequent, neurological complications are uncommon in canicola fever. The features of the case indicate that it is a further example of the shoulder-girdle syndrome. It is presumed that this resulted from a hypersensitivity reaction to the infection.

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A leaflet on foot exercises for children has recently been published by the Foot Health Educational Bureau of the Central Council for Health Education. This leaflet, produced in collaboration with Guy's Hospital, presents a series of simple movements in place of the traditional more drastic exercises for feet, with appealing illustrations. Directions and pictures are simple enough for a child to interpret and follow. The price of the leaflet is 4s. a dozen. Copies may be obtained from the Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

Medical Memoranda

A Case of Recurring Hydatidiform Mole

The incidence of hydatidiform mole is difficult to estimate, as it is now recognized that minor degrees of vesiculation of chorionic villi are quite commonly found when abortion specimens are examined histologically, but the macroscopic mole probably occurs in approximately 1 in 1,000 pregnancies.

In a follow-up of more than 50 cases of hydatidiform mole treated at the London Hospital from 1905 to 1937, Brews (1939) found a single case of recurring molar pregnancy. Essen-Möller (1912) collected 18 cases of repeated molar pregnancy. Clinically, associated theca lutein cysts are commoner in the age group below 30 years, and these cysts have been known to undergo torsion after the uterus has been emptied.

CASE REPORT

A 1-para aged 30 attended the gynaecological clinic on December 28, 1953, complaining of a blood-stained vaginal discharge which had persisted for three weeks and had followed a six-weeks period of amenorrhoea.

In November, 1951, she spontaneously expelled a hydatidiform mole, and this was followed by evacuation of the uterus per vaginam under a general anaesthetic. Following this, quantitative Aschheim-Zondek tests were done at regular intervals until October, 1952, and were all negative. She was next seen in February, 1953, when she was found to be 16 weeks pregnant, the size of the uterus corresponding with the period of amenorrhoea. In July, 1953, she had a spontaneous delivery of a live baby girl. Following this normal pregnancy she had three normal menstrual periods, occurring every 31 days, the bleeding lasting six days. Her last period had been on October 22, 1953. After six weeks' amenorrhoea she began to have a blood-stained watery discharge per vaginam, and the day before she was seen she had had a heavy blood loss. She had nausea, but otherwise had been well.

On examination her general condition was good and her breasts appeared to be active. The uterus was palpable abdominally and was enlarged to the size of a 12-weeks pregnancy. On pelvic examination the size of the uterus was confirmed. A quantitative Aschheim-Zondek test was done and was positive undiluted and in a dilution of 1 in 10, but was negative in higher dilutions. Two weeks later the patient was seen again, when she said that she had continued to bleed intermittently and had been vomiting. Her blood pressure was 140/90 mm. Hg, and no albumin or acetone was detected in the urine. On abdominal examination the fundus of the uterus was palpable 1 in. (2.5 cm.) below the umbilicus, although the period of amenorrhoea was then only 12 weeks. No foetal heart sounds were heard and no foetal parts palpated.

The following day the patient was admitted to hospital for observation. Her haemoglobin was 72%, and a catheter specimen of urine showed a very faint trace of albumin, but was otherwise normal. While in hospital she continued to have intermittent bleeding per vaginam and, although her vomiting improved, nausea persisted. Her blood pressure varied between 135/75 and 110/60. X-ray examination of her abdomen showed no foetal parts. Her uterus continued to enlarge rapidly, and on February 2, 1954, after 15 weeks' amenorrhoea, the fundus of the uterus was above the level of the umbilicus. A quantitative Aschheim-Zondek test done on January 25 was positive in all dilutions up to 1 in 1,000. A diagnosis of hydatidiform mole was made, and it was decided to evacuate the uterus.