aminoglycosides (8). The use of ciprofloxacin has also been indicated for such conditions (9, 10). There is no place for penicillins in the treatment of MEO due to the high rate of resistance of Pseudomonas aeruginosa. Surgical treatment involving local debridement is useful for removing osteitic foci and necrotic tissue inaccessible to antimicrobial agents. This aggressive surgical procedure is only used when medical treatment fails.

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References


Human Leptospirosis in the Vicenza Area, Italy

Since the late 1960s a progressive decrease in the number of cases of human leptospirosis has been reported in Northern Italy. Nevertheless, the disease still continues to occur as a result of occupational, recreational or accidental exposure to the etiological agent.

We report the main clinical and epidemiological features of 86 cases of leptospirosis observed at the S. Bortolo Hospital, Vicenza, Italy in the period from August 1979 to August 1990.

The rapid Difco macroscopic (slide) agglutination test for leptospires (1) was carried out on admission for every patient with possible exposure and/or clinical data suggesting leptospirosis. The diagnosis of leptospirosis was definitively confirmed using the microscopic agglutination test (MAT), according to the method described by Addamiano and Babudieri (2), on paired acute and convalescent sera. Sixteen different Leptospira strains, representing the circulating serovars in Italy (3), were used as antigens. Either seroconversion to > 1:100 or a four-fold or greater rise in antibody titre, as well as, in the event of steady antibody levels, titres of > 1:1,000, were considered diagnostic. In some patients serum sample(s) drawn two to 11 years after the illness were also tested.

Those affected (79 males and 7 females) were mainly aged 21 to 50 years (50 patients). Forty-one cases occurred in farmers and construction workers and 32 cases in individuals who fished as a hobby or had occasional contact with ditch or river water as well as with domestic and/or wild animals or with moist soil. In two patients leptospirosis was contracted during a recreational trip to Thailand (Leptospira hardjo) and Australia (Leptospira zanoni), respectively. In six cases (7 %) no source of infection could be identified. The monthly incidence of clinical cases is reported in Figure 1.

As for clinical syndromes, Well’s disease was observed in 41 patients (47.7 %), hepatitis-like syndrome in 19 (22.0 %), acute febrile illness in 12 (13.9 %), nephritis-like syndrome in eight (9.4 %), meningitis in three (3.5 %) and severe myocarditis in one (1.2 %). Two patients presented with both Well’s disease and meningitis. Apart from the patients affected with full-blown meningitis, four additional patients suffering from vomiting and headache but not with stiff neck showed mild CSF pleocytosis (leukocyte...
count 20–70 mm³). Conversely, in three patients who exhibited meningeal signs, CSF examination was normal. Severe thrombocytopenia occurred only in 13 patients (Weil’s disease).

Because of the presence of coagglutinins, the etiological serovar could be identified in only 58 patients. *Leptospira icterohaemorrhagiae* and *Leptospira copenhageni* together accounted for 32 cases (55.2 %), *Leptospira canicola* for seven (12.1 %), *Leptospira sejroe* for four (6.9 %) and *Leptospira zanoni* for three (5.2 %). Other serovars caused either one or two cases each.

Eighty-two patients received antibiotic treatment for ten days. These patients were placed on a regimen of either penicillin G, 12 x 10⁶ U daily (45 patients), or ampicillin, 6 g daily (37 patients), administered intravenously. Seven of the first 34 subjects receiving this treatment showed a sharp increase of fever (> 39.5 °C), chills, headache, tachycardia and mild hypotension in the first hours of treatment. Therefore, in order to prevent an abrupt lysis of leptospires, which could incite a Jarisch-Herxheimer reaction (4, 5), in the first 24 h of therapy the subsequent 52 patients were given reduced doses of either 2 g ampicillin (500 mg every 6 h) or 2 x 10⁶ U penicillin G (500,000 U every 6 h). A four to five day course of corticosteroids therapy (prednisone 40 mg once daily) was also administered, and no further patient showed any systemic reaction. Hemodialysis was required for eight patients affected with Weil’s disease.

Eighty-one patients (94.2 %) had an uneventful recovery and five, all suffering from Weil’s disease, died in the first one to two days of hospitalization (shock, 2 cases, and pulmonary oedema, 1 case) or later (bronchopneumonia or intracerebral haemorrhage, 1 patient each).

In the subjects infected by *Leptospira icterohaemorrhagiae*/*Leptospira copenhageni*, quantitative analysis of sera obtained during the illness and year(s) after the acute disease generally revealed a complex pattern: some titres dropped to 50–40 % or lower in comparison to the initial ones, while others remained unchanged or even increased in the time since the acute illness. Overall, high residual MAT titres were found in 40.7 % of the sera examined. This latter finding was particularly evident in patients examined nine to ten and 11 years after the illness.

Our data emphasize that the clinical course of the disease can be very protean. Indeed, two subjects were hospitalized for gastroenteritis, one was at first admitted to the Haematology Department due to severe thrombocytopenia, and another underwent appendicectomy for putative appendicitis. They also show that in a few patients leptospirosis can occur without any apparent contact with any source of infection and that this illness should be considered in all travellers returning from endemic areas and suffering from syndromes consistent with leptospirosis or from otherwise unexplained fever. In addition, two observations seem to be of special interest. First, serum titres against the icterohaemorrhagiae serogroup persisted over years. Indeed, the MAT titres did not decline regularly over time but remained the same as or even surpassed the initial titre. It is possible that individuals with constant or increased titres are continually re-exposed to infection, leading to a boosting of their antibody levels against the immunodominant serovar. The occurrence of reinfection could be supported by the high endemism for leptospirosis in the Vicenza area (6) as well as the high risk of infection for the subjects considered.

The second noteworthy observation is the occurrence of a Jarisch-Herxheimer-like reaction in seven of 34 patients who received the full antibiotic dosage from the onset of therapy. Conversely, none of the remaining 52 patients who received lower doses of antimicrobial agents in the first 24 h of treatment, combined with a short course of corticosteroid therapy, showed any sys-

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**Figure 1:** Monthly incidence of 86 clinical cases of human leptospirosis.