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LETTER

The clinical picture of severe leptospirosis in critically ill patients

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Dear Editor,

Leptospirosis is a potentially fatal zoonosis caused by a spirochetes belonging to the genus *Leptospira* (*L. interrogans*) [1]. It has a worldwide distribution but is more common in the tropics where conditions for its transmission are particularly favorable [2]. The disease is emerging in temperate countries in both rural and urban areas, the source of infection in human being from contact with urine of an infected animal via small abrasions or breaches in the skin during occupational, recreational, habitational, or vocational activities [3]. Leptospirosis has protean manifestations, and mimics the clinical presentation of many other diseases such as angiocholitis or hepatitis, raising concerns about source control when these patients present with septic shock [4]. One hundred patients with microbiologically documented leptospirosis were admitted to the medical intensive care unit (ICU) of Ibn Sina University Hospital, Rabat, Morocco, a major referral center for the Northwestern region. All cases met WHO diagnostic criteria and serologically proven leptospirosis using an IgM-specific ELISA (titer > 100) [5]. All parameters described below were recorded at ICU admission. Mean age was 36 ± 15 years and 92% were male. Professional exposure was identified in 58% of the patients, including vegetables, poultry or fish merchants (31%), dustmen or plumbers (11%), laborers (10%), or farmers (6%). At ICU admission, APACHE II was 12.5 ± 6.4 and SAPS II was 24 ± 11.5. Median time since symptoms onset was 8.5 (IQR 7–15) days. All but one patient presented with jaundice, 76% with bleeding, 55% with vomiting, 25% with abdominal pain, 26% had temperature greater than 38.5 °C, 24% stupor, 17% conjunctival hemorrhage, and 11% of patients presented with shock. Pulmonary involvement (cough or dyspnea or crackles on pulmonary auscultation or hemoptysis and lung infiltrates on chest x-ray) occurred in 42% of the patients, including 12% of patients with acute respiratory failure. Among the 33 patients who underwent lumbar puncture, half presented with lymphocytic meningitidis. All patients presented with acute kidney injury (urea 2.7 ± 1.2 g/L, creatinine 60 ± 30 mg/L), elevated bilirubin (383 ± 313) and transaminases below two times the normal. Patients also presented with hyperleukocytosis ($18.8 \pm 9.9 \times 10^9$/L), anemia (11.1 ± 2.7 g/L), and thrombocytopenia (111 ± 123). Sixty nine percent of patients presented with platelet count below 100,000/L. Last, prothrombin time (PT) was 68 ± 21%. Length of ICU stay was 8.3 ± 6 days. ICU mortality was 23%. Patients who died in the ICU were older, more frequently had stupor, shock, or respiratory failure at admission, had higher creatinine levels, and lower PT at admission. All patients received antibiotics within 24 h of ICU admission (penicillin G in 79%, ampicillin in 15%, and doxycycline in 6%). Eleven (11%) patients needed mechanical ventilation and 11 vasopressors. Renal replacement therapy was needed in only 4% of patients. Among clinical variables available at ICU admission, those associated with ICU mortality by univariable analysis are disclosed in Fig. 1. By multivariable analysis, Glasgow coma scale [OR 29.6 (4.4–200)], respiratory rate greater than 30 [OR 40.7 (3.2–521)], and lung infiltrates [OR 7.5 (1.2–47.5)] were independently associated with ICU mortality. Our findings are important as they allow one to maintain a high level of suspicion for the diagnosis of severe leptospirosis. Moreover, predictors of mortality assist physicians in avoiding delayed ICU admission for those patients with mild to moderate alteration of consciousness, and those with pulmonary involvement either from lung pneumonia or alveolar hemorrhage. Studies to routinely assess etiologies of CNS and lung involvement in patients with

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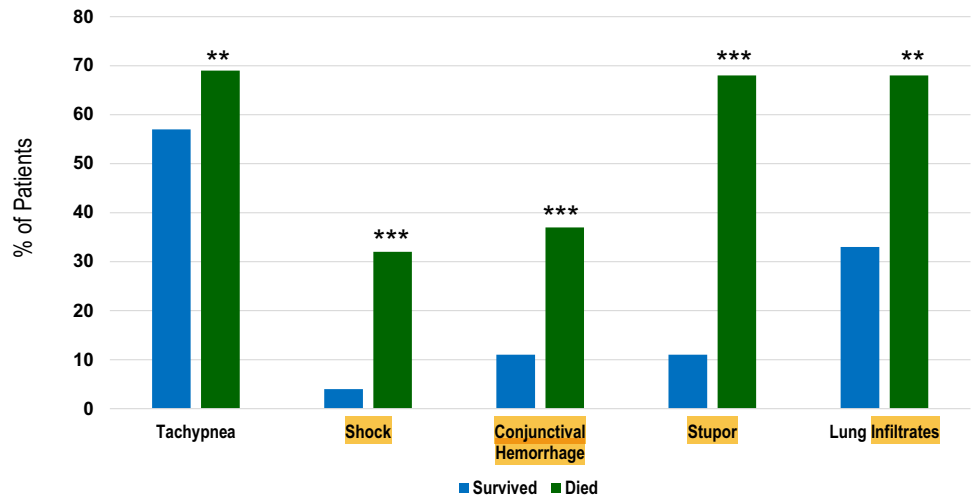

Fig. 1 Clinical variables available at ICU admission that were associated with ICU mortality by univariable analysis. $^{**}P < 0.05$; $^{***}P < 0.01$

severe leptospirosis are needed. Also, large studies comparing management and outcomes across different settings and different countries are warranted.

Compliance with ethical standards

Conflicts of interest

All declare that they have no conflict of interest.

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