The short evaluation of the injured patients with acute renal failure who required dialysis and transferred to our centre during the Marmara earthquake

Sir,

On 17 August 1999, an earthquake struck a densely populated region in north-western Turkey. Four major cities and a number of towns and villages were destroyed. Approximately 158,455 people were killed and 43,953 were injured.

Bursa was not seriously affected by the disaster, although the earthquake shocks arrived at the city. On the first and second day, approximately 1,750 injured subjects were transported to four hospitals in our city. Among them 927 were hospitalized (the remainder were treated in different outpatient clinics) and 867 operations were performed. We identified 111 patients with crush syndrome. One hundred and eight of the 927 patients developed acute renal failure, and 92 required haemodialysis.

Our dialysis unit had 35 haemodialysis machines which were used for the treatment of 135 chronic renal failure patients before the disaster. We treated an additional 59 patients with daily dialysis. Our dialysis unit worked 24 h a day for a month. During this time, national and international assistance was available at our centre, including dialysis equipment and personnel. A total of three teams came from abroad to help us in our busy working days. The first team consisted of Dr Schindler, a German nephrologist from Berlin and five nurses; the second consisted of six French nurses and the third of three Belgian nurses. Twenty new dialysis machines were added to the ones already present.
Ten of them were donated, the rest were bought. The additional patients consisted of 33 men and 26 women with a mean age of 29±13 years (range 11–61). The time they had been trapped ranged from 3 to 72 h (11±14). Oliguric acute renal failure had developed in 50 patients (84.7%). Mean duration of oliguria in the patients was 10.1±7.3 days (1–36). On admission, mean serum creatinine level was 3.8±2.0 mg/dl. The peak serum creatinine level reached was 6.0±2.2 mg/dl (2.6–12.6). The peak serum CPK level was 9235±20126 U/l (247–86440). The mean number of dialysis session days was 14.7±9.8 (2–48).

We eliminated pre-renal factors in patients who had oliguria and/or elevated serum creatinine levels. We tried to increase urine flow and achieve fluid-electrolyte and acid-base balance. Dialysis was started even in patients with serum BUN, creatinine, potassium and bicarbonate levels slightly above or below normal limits. Patients tended to be volume depleted and in many instances a large amount of serum was lost from wounds. The patients received adequate volume replacement with human albumin, plasma, whole blood, dextrose or hypotonic sodium chloride solutions during dialysis sessions, whenever required. Forty-eight patients were treated with haemodialysis, two with continuous slow haemodiafiltration and 11 with both dialysis modalities. The total number of dialysis sessions reached 881.

Nearly all patients had severe limb trauma, 37 of them underwent fasciotomy for compartmental syndrome and 10 required amputation. Injury sites were as follows: lower extremity 33; upper and lower extremities 12; upper extremity 4; multiple trauma 4; trunk 3; and trunk and lower extremity 3. Sigmoid colon had to be resected in one patient with abdominal trauma. Two patients had urinary bladder ruptures repaired. Many wounds were infected. Thirty-one patients had systemic infections. Most of the patients received cefazidime plus metronidazole as antibiotic regimen whereas others were given vancomycin and/or imipenem, according to blood culture results.

Twenty of the 59 patients died (33.9%), 12 from multiple organ failure caused by sepsis, two from massive haemorrhage (retroperitoneal haematoma) and 6 from other types of circulatory failure. The renal function of the other patients recovered with time. Further, more detailed, analysis of the injured patients is in progress.

Though treatment possibilities for chronic renal failure patients are not sufficient in our country, we attempted to treat all the acute renal failure patients of the earthquake disaster with tremendous effort together with national and international assistance. Although the terrible disaster we have lived through was a dreadful event, it greatly increased the experience of nephrologists of crush syndromes.