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Treatment of metformin-associated lactic acidosis with sustained low-efficiency daily dialysis

Sir,

Sustained low-efficiency daily dialysis (SLEDD) is an intermittent prolonged dialysis modality which is increasingly used for the treatment of acute renal failure [1,2], as it combines most of the advantages of both the classic intermittent treatments and the continuous modalities in terms of safety, efficacy, haemodynamic stability and costs. GENIUS® 90 Therapy System (GENIUS) (Fresenius Medical Care, Bad Homburg, Germany) gained interest for application in SLEDD for the treatment of acute renal failure [1,2] as well as of acute drug intoxication [3–6]. No published experience exists about the use of SLEDD in metformin-associated lactic acidosis (MALA). Here we report the case of a 64-year-old diabetic woman who on 12 November 2007 was admitted to the gynaecology unit of our hospital in order to undergo a surgical intervention for the correction of hysterocele, cystocele and enterocele. On 14 November 2007 she underwent colpohysterectomy, McCall culdoplasty, urethrocytostomy and colpoperineoplasty. Her past medical history included mild chronic renal failure (serum creatinine levels were between 1.3 and 1.5 mg/dl), arterial hypertension and type II diabetes mellitus. At the time of admission she was being treated with the following drugs (daily doses): metformin 3000 mg, allopurinol 300 mg, verapamil 120 mg, irbesartan 300 mg and furosemide 25 mg. On 17 November serum creatinine level was 1.4 mg/dl; on 18 November the patient

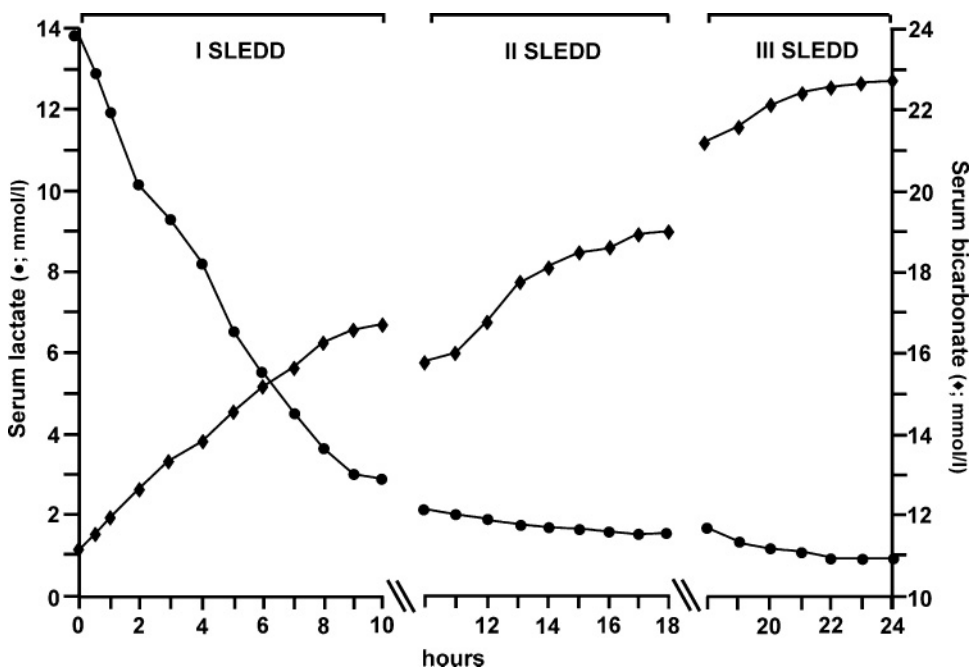


Fig. 1. Hourly measurements of serum lactate (●) and bicarbonate levels (◆) during the three sessions of SLEDD with GENIUS.

became oliguric, confused and started to be affected by nausea, vomiting, abdominal pain and anorexia. On 19 November serum creatinine level was 5.7 mg/dl and liver enzymes were normal. Irbesartan and metformin therapy were stopped. A renal ultrasound showed normal kidney volume with distinctly reduced thickness, a small increase of echogenicity and no hydronephrosis. In the evening, the patient became anuric and presented diffuse oedema, rales at lung bases and tachypnoea. Drowsiness appeared. She was hypoglycaemic at 50 mg/dl; blood pressure was 90/40 mmHg; the serum creatinine level was 7.4 mg/dl. Lactic acidosis was diagnosed: pH 7.16, serum bicarbonate level 11.1 mmol/l, serum lactate level 13.8 mmol/l (normal values: 0.5–1.6 mmol/l). A double lumen 12 F central venous catheter was positioned in the left femoral vein and a 10-h SLEDD session with GENIUS was started. A low-flux polysulfone membrane (F7; surface area 1.6 m²; Fresenius Medical Care, Bad Homburg, Germany) was applied, blood/dialysate flow was set at 120 ml/min and the ultrafiltration rate at 150 ml/h. Anticoagulation of the circuit was obtained with heparin 5000 IU/treatment. Dialysate composition was as follows: calcium, 1.5 mmol/l; magnesium, 0.5 mmol/l; potassium, 3 mmol/l; sodium, 140 mmol/l; bicarbonate, 35 mmol/l; chloride, 111.5 mmol/l; hydrochloric acid, 2.0 mmol/l; glucose, 5.5 mmol/l and citrate, 0.084 mmol/l. At the start of the SLEDD session, blood pressure was 100/50 mmHg and was constant during the treatment. Blood samples were collected every hour for the serum bicarbonate and lactate level measurement. Five hours after the end of the first GENIUS treatment, the patient started a new 8-h SLEDD session with GENIUS (on 20 November), and on 21 November a further 6-h SLEDD session with GENIUS was started 18 h after the end of the second session. Serum bicarbonate and lactate levels are shown in Figure 1. There was a rapid decrease in serum lactate levels and the reciprocal increase in serum bicarbonate levels during the three SLEDD sessions. A complete normalization of acid–base balance and of serum lactate levels with cessation of anuria was observed after three treatments. On 23 November, pH was 7.41, serum bicarbonate levels 24.5 mmol/l and serum lactate levels

1.5 mmol/l. On 29 November the patient was discharged from the hospital with serum creatinine levels of 2.9 mg/dl. After 3 months her serum creatinine levels were back to 1.4 mg/dl. In conclusion, SLEDD with GENIUS is able to offer an adequate and well-tolerated dialysis treatment for the therapy of MALA associated with severe oligoanuric acute renal failure.

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