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Letter to the Editor

Unexpected Extremely High Level of Creatinine in Non-dialysed Female Patient

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Dear Sir,

There are only a few published studies confirming the ability of either urea or creatinine to induce adverse biochemical and physiological effects and there is not a defined level of serum creatinine that is lethal itself. Given the fact that by consulting the literature we did not find the highest level of creatinine in a surviving patient published in Croatia, we want to present the highest recorded level in our practice and probably in Croatia.

A sixty-two year old woman presented to the Merkur Clinical Hospital Emergency Department in Zagreb with the serum creatinine 2316 µmol/L (26.2 mg/dl) and a one week history of uremic symptoms. Her previous medical history was negative; she has not been taking any medications. Renal failure in this patient occurred due to bilateral hydronephrosis developed as the result of advanced cervical malignancy and was accompanied by severe microcytic anemia (hemoglobin 35 g/l, hematocrit 0.120, MCV 71.4 fL), compensated metabolic acidosis (arterial pH 7.230) and hyperkalemia (serum potassium 6.4 mmol/l). An acute hemodialysis was made on the day of admission. About one month later at the time of the discharge the serum creatinine was 490 µmol/L. During hospitalization the patient was conscious, oriented and cardiorespiratory compensated.

Creatinine is the endogenous marker most commonly used to measure kidney function [1]. The proximal tubules secrete creatinine, which accounts for 10-20% of the excreted load [2]. The normal reference range for serum creatinine is 0.7 to 1.3 mg/dL (62-115 umol/L) for men and 0.6 to 1.1 mg/dL (53-97 umol/L) for women [3]. Progressive obstructive uropathy may lead to uremia, electrolyte imbalances and persistent urinary tract infections, if obstruction is not bypassed [4], as we report in this case. Although it is a marker of uremic toxicity, the actual effect of creatinine on homeostasis in humans is unresolved [3]. One of the most disabling features of kidney failure is encephalopathy that is caused by the accumulation of uremic toxins [5]. The patient we report on presented the highest creatinine level (2316 µmol/L) we experienced in our twenty-eight years long practice and presented with symptoms of uremia including nausea, vomiting, fatigue and slowed cognitive functions. Searching through literature and available data we could not find written evidence on the highest creatinine level in practice in Croatia in non-dialysed patients. A literature search indicates that the surviving uremic male patient (BMI 28) with creatinine 53 mg/dl (4685.2µmol/L) reported by A.C. Storm *et al.* in Open Journal of Nephrology (2013) could be the highest creatinine in the literature [3].

A renal failure and increased creatinine level in the patient we reported occurred due to bilateral hydronephrosis that had been developed due to advanced stage of cervical carcinoma. The finding of ureteral obstruction due to malignancy carries a poor prognosis with a resulting median survival of 3 to 7 months, and confers a worse overall prognosis [4,6]. Relief of obstruction is usually achieved by placement of a percutaneous nephrostomy tube, an internalized double J nephroureteral stent, or an internal/external nephroureteral stent (NUS) [7]. Our patient had rejected suggested bilateral percutaneous nephrostomy as modality of decompression and accepted life saving dialysis. This patient with the highest recorded serum creatinine in our practice and according to available data in Croatia has survived uremic symptoms and has been discharged with a program of hemodialysis three times per week.

The highest level of creatinine (2316 µmol/L) we registered manifested through early symptoms of uremia and minimal changes in mental status suggest that creatinine as a potential uremic toxin has a minor pathophysiologic role in causing uremic syndrome and encephalopathy.

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Conflict of interest statement. None declared.

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References

1. Samra M, Abcar AC. False Estimates of Elevated Creatinine. *Perm J* 2012; 16: 51-52.
2. Endre ZH, Pickering JW, Walker RJ. Clearance and beyond: the complementary roles of GFR measurement and injury biomarkers in acute kidney injury (AKI). *Am J Physiol Renal Physiol* 2011; 301: 697-707.
3. Storm AC, Htike NL, Cohen DA, *et al*. A Surviving Patient with Record High Creatinine. *Open Journal of Nephrology* 2013; 3: 217-219.
4. Kouba E, Wallen EM, Pruthi RS. Management of ureteral obstruction due to advanced malignancy: optimizing therapeutic and palliative outcomes. *J Urol* 2008; 180: 444-450.
5. Seifter JL, Samuels MA. Uremic encephalopathy and other brain disorders associated with renal failure. *Semin Neurol* 2011; 31: 139-143.
6. Pradhan TS, Duan H, Katsoulakis E, *et al*. Hydronephrosis as a prognostic indicator of survival in advanced cervix cancer. *Int J Gynecol Cancer* 2011; 21: 1091-1096.
7. Monsky WL, Molloy C, Jin B, *et al*. Quality-of-Life Assessment After Palliative Interventions to Manage Malignant Ureteral Obstruction. *Cardiovasc Intervent Radiol* 2013; 36: 1355-1363.