**Elevation of serum creatinine in a renal transplant patient following the use of creatine supplements**

**Introduction**

We report the case of a 29-year old Caucasian male presenting with elevated serum creatinine (Cr) levels on routine renal transplant clinic bloods whilst taking creatine ethyl ester (CEE) supplementation. To date, there is an absence of literature that reports associated Cr rise following ingestion of exogenous creatine in a renal allograft patient.

**Case**

This report describes a case in which elevated Cr levels were present in the absence of true underlying renal allograft pathology that reversed on discontinuation of the supplement. The patient was 18 months post-transplant with a stable median creatinine of 108umol/L; he was receiving standard tacrolimus/prednisolone/mycophenolate immunosuppression. Routine clinic bloods revealed a raised serum Cr of 245umol/L. All other routine bloods were within normal range. He admitted to taking 3.2g CEE daily. Previously he had been taking 5g/day of creatinine monohydrate (CM) for six months. Serum polyomavirus PCR was undetectable. Tacrolimus trough level was 5.8ng/ml (4 to 7ng/ml) and donor-specific HLA Class I and II antibodies were negative. Midstream urine was negative for infection and albumin-creatinine ratio was 1.1mg/mmol. Doppler ultrasound of the allograft demonstrated patent vessels, normal intrarenal resistive indices, and no hydronephrosis. A kidney biopsy showed no evidence of acute or chronic tubular damage, nor were there signs of antibody or T cell-mediated rejection, or calcineurin inhibitor toxicity. Immunostaining for SV40 and C4d were negative. The patient was treated conservatively and serum Cr reverted to baseline within three days of stopping the CEE. Written consent was obtained from the patient.

**Discussion**

Renal allograft dysfunction is a common complication post-transplantation and can lead to graft loss. Creatinine is used as a marker of renal function as it is excreted in the glomerulus and to a lesser extent the proximal tubule. Creatine supplements are commonly taken to enhance muscle function and therefore performance; and are readily available in CM and CEE forms. CM is well-studied with trials suggesting safety when taken at doses of 5-20g per day. As it is not degraded during digestion with 99% taken up by muscle or excreted into urine, serum Cr is mostly unaffected. CEE by comparison is thought to have better solubility in lipids and is largely converted into and absorbed as Cr in the gastrointestinal tract. This can result in elevated serum Cr up to 2-3x baseline, rendering serum Cr a less viable surrogate for glomerular filtration rate (GFR). Other options of measuring the relationship between high serum creatinine and reduced renal clearance, such as Isoptopic GFR testing, may be suitable in these patients.

We report this case to raise awareness of the commonly ingested substance creatine ethyl ester which may give rise to an elevated serum Cr resembling that of advanced renal dysfunction. We also re-emphasise the importance of a detailed drug history, here in particular when dealing with transplanted kidney function in recipients.