There were no significant differences in baseline characteristics between the two groups (Table 1). Antioxidant supplementation with vitamin C and vitamin E resulted in significant changes in plasma concentrations of vitamin C (40±48 vs. -19±33 μmol/l for placebo, P<0.001) as well as vitamin E (25±15 vs. 1±10 μmol/l for placebo, P<0.001). CsA trough-levels decreased in the treatment group compared with the placebo group (−14±25 vs. 10±30 mg/l, P = 0.003), as did the serum creatinine concentration (resp., −6±17 and 4±15 mmol/l, P = 0.035). Neither changes in vitamin C nor changes in vitamin E concentrations were correlated with changes in CsA trough-levels or changes in serum creatinine concentrations in the treatment group. A borderline significant correlation was found between changes in CsA trough-levels and changes in serum creatinine concentrations (r = 0.36, P = 0.07).

The results of our study confirm the finding by Blackhall et al. [1] that antioxidant supplementation reduces CsA trough-levels in renal transplant recipients. Injurious use of vitamin C and E supplementation should therefore be avoided, until it has been documented that the decreased CsA levels associated with their use pose no risk for transplant rejection. Blackhall et al. [1] also found a significant decrease in serum creatinine concentrations. Our results confirm this finding as well. Blackhall et al. [1] supplemented β-carotene in addition to vitamin E and vitamin C, whereas our study only supplemented the latter two anti-oxidants. It is therefore unlikely that β-carotene in the study of Blackhall was responsible for either the changes in CsA trough-levels or the changes in serum creatinine concentrations.

In conclusion, we concur with Blackhall et al. [1] that transplant nephrologists should be aware of the CsA trough-level lowering effect of anti-oxidants.

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Conflict of interest statement. None declared.

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Table 1. Baseline characteristics of the study participants

<table>
<thead>
<tr>
<th></th>
<th>Placebo</th>
<th>Antioxidant</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 28</td>
<td>n = 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>52 (10)</td>
<td>54 (11)</td>
<td>0.53</td>
</tr>
<tr>
<td>Male sex, n (%)</td>
<td>16 (57)</td>
<td>12 (48)</td>
<td>0.59</td>
</tr>
<tr>
<td>Time since transplantation (years)</td>
<td>8.0 (4.3)</td>
<td>9.6 (6.7)</td>
<td>0.19</td>
</tr>
<tr>
<td>Vitamin C (μmol/l)</td>
<td>61 (32)</td>
<td>56 (25)</td>
<td>0.53</td>
</tr>
<tr>
<td>Total vitamin E (μmol/l)</td>
<td>36 (8)</td>
<td>35 (10)</td>
<td>0.75</td>
</tr>
<tr>
<td>CSA trough-level (μg/l)</td>
<td>108 (42)</td>
<td>105 (40)</td>
<td>0.85</td>
</tr>
<tr>
<td>Serum creatinine (μmol/l)</td>
<td>132 (34)</td>
<td>130 (36)</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Data are presented as mean (SD). Differences between groups were investigated using Student’s t-test for continuous variables and χ²-square for proportions.


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Advance Access publication 11 October 2005

Incidence of chronic kidney disease in India

Sir,

Chronic kidney disease (CKD) is a global threat to health in general and for developing countries in particular, because therapy is expensive and life-long. In India ~90% patients cannot afford the cost. Over 1 million people worldwide are alive on dialysis or with a functioning graft [1]. Incidence of CKD has doubled in the last 15 years. In the USA, ~30 million people suffer from CKD [2] and by 2010 >600,000 patients will require renal replacement therapy, costing US$28 billion [3].

Risk factors for developing CKD differ between races and countries. It would be interesting to know the incidence of CKD and its causes in India, which is a densely populated country with low income, different food, cultural traditions and lifestyle habits. In contrast to high-income countries, patients with ESRD have to pay for dialysis and transplantation themselves. The currently reported incidence of CRF in India is based on extrapolated data from the US. As yet, no large-scale population studies are available.

We conducted two studies: (i) a population screening in New Delhi [4] and (ii) a second prospective study that involved 48 hospitals. In the population screening 4712 subjects participated in a blood biochemistry test. Mean age was 42.38 ± 12.54 years, 56.16% were male. Thirty-seven were found to have chronic renal failure (prevalence rate of 0.78%). If these data are applied to India’s 1 billion population there are ~7.85 million CRF patients in India. Aetiologically, diabetes (41%), hypertension (22%), chronic glomerular nephritis (16%), chronic interstitial disease (5.4%), ischaemic nephropathy (5.4%), obstructive uropathy (2.7%), miscellaneous (2.7%) and unknown cause (5.4%) constituted the spectrum.

The second study was more representative, as 48 centres were distributed all over India. Data were based on prospective investigations conducted over a period of 1 (33 hospitals) to 3 months (15 hospitals) comprising 4145 CKD patients. It showed the following aetiological pattern: diabetes (29.7%), chronic glomerulonephritis (19.3%), hypertension (14%), chronic interstitial disease and vesico-ureteral reflux (12.6%), obstruction and calculus (9.3%), ADPKD and Alport Syndrome (8.4%), undiagnosed (6.2%). This study shows that the prevalence of CRF in India is ~0.8%. If we combine the two, diabetes has emerged as the most frequent cause (30–40%) followed by hypertension (14–22%), CGN (16–20%), CIN (5.4–12.7%), heredofamilial disease (8.4%), obstruction including calculus (2.9%). The two studies, which are different in some ways, perhaps explain the wide range in incidence, suggesting regional influences.
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Fever with acute renal failure due to body massage-induced rhabdomyolysis

Sir,

Body massage, known as complementary and alternative medicine, is very popular in the world [1,2]. [It is considered a relatively safe therapy for the senior population that attempts to relieve pain or improve quality of life.] However, in one incident, an 88-year-old man developed rhabdomyolysis in the aftermath of a body massage session.

The gentleman was quite healthy in the past, with a history of type 2 diabetes mellitus under well-controlled by diet. He presented with a fall-down accident due to weakness of four limbs, fever (~38°C), acute renal failure (ARF) (creatinine 1.7 mg/dl, urea nitrogen 22 mg/dl) and mild proteinuria (initial urinalysis: protein ++, occult blood ++++, WBC 5–10/HP, RBC 0–2/HP), but no significant ecchymosis or swelling of whole body were found. Though urinary tract infection was once suspected at a local hospital for his fever, leucocytosis (WBC 21.5×10⁹/µl, neutrophils 89%) with mild pyuria, it was excluded by repeated urinalysis (protein 100 mg/dl, pH 5.0, WBC 0–2/HP, RBC 0–2/HP) and finally sterile cultures of urine and blood. His blood biochemistry showed as follows: aspartate aminotransferase 322 U/l, alanine aminotransferase 72 U/l, lactic dehydrogenase 1224 U/l, creatine phosphokinase (CPK) 7940 U/l with 100% of CPK-MM form, potassium 6.5 mEq/l, creatinine 1.2 mg/dl and urea nitrogen 19 mg/dl. After adequate hydration with intravenous fluid, solute alkaline diuresis and rapid-acting insulin, his serum potassium level normalized within 6 h and his fever subsided with regained strength 3 days later. The time–concentration curve of CPK was almost parallel to that of WBC of peripheral blood and serum C-reactive protein (CRP) level (Figure 1), indicating that the extent of inflammation was closely related to rhabdomyolysis process.

An enquiry disclosed the habit of the patient: for more than 40 years, he had regularly received body massage for 1–2 h every other day. The afternoon before this accident, he received a body massage session for 2 h served by two new massagists at the same time instead of one. The strength of this massage session was significantly stronger than that of the past. He drank little water before and after the massage session. Generalized muscle pain and soreness developed that night but was not given attention.

Compression or pressure-induced rhabdomyolysis has been reported in coma or immobilized patients [3,4],...