any facility which cares for other immunocompromised individuals whilst still potentially infectious.

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Raised intracranial pressure in chronic respiratory disease

SIR—Dimond and Pallazzo (Jan 11, p 98)[1] report a patient with signs of actual intracranial hypertension due to a severe exacerbation of asthma. We have treated a patient with signs of raised intracranial pressure and encephalopathy in the context of respiratory disease of different aetiology.

A 60-year-old woman who had arrived from Zaire the day before, was admitted to our hospital for headache and chest pain. On admission, she was overweight with fever of 38·5°C and signs of right ventricular insufficiency. Within 12 h of admission her condition deteriorated rapidly: she became confused; developed severe hypertension (240/120 mm Hg) and hypothermia (rectal temperature 34·9°C); and was transferred to an intensive-care unit. She had bilateral papilloedema. Cranial computed tomography showed diffuse cerebral oedema. She had severe hypercapnia, hypoxaemia, and respiratory acidosis (pCO_2 97·2, pO_2 27·6 mm Hg, pH 7·11). She was hypoventilating, which necessitated mechanical ventilation for 3 days, during which time the signs of encephalopathy and cerebral oedema disappeared. Her medical history revealed daytime fatigue, chronic headache, and peripheral oedema for at least 10 years. Sleep studies 20 days after admission showed obstructive sleep apnoea syndrome. She was supplied with a continuous positive-airway-pressure device and made a good recovery.

In this case, obstructive sleep apnoea in an overweight woman resulted in chronic pulmonary and systemic hypertension which interfered with central breathing regulation. Deterioration of oxygen supply then triggered a vicious circle of progressive central deregulation with hypoventilation, hypercapnia, hypoxaemia, autonomic failure, encephalopathy, and cerebral oedema. This case lends support to Dimond and Pallazzo's report that patients with chronic respiratory disease of different aetiology may present with signs of raised intracranial pressure.

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Thyrotoxic hypokalaemic periodic paralysis

SIR—Lazarus (Feb 1, p 339)[1] notes that a high index of suspicion is often required in the diagnosis of hyperthyroidism, but he neglects to mention one presentation in which the disorder may not be readily apparent, or not considered by most physicians: hypokalaemic periodic paralysis. We recently treated a 26-year-old white man in whom hypokalaemic lower extremity paralysis was the presenting symptom of thyrotoxicosis.

During the previous month the patient had had four similar episodes that resolved spontaneously. There was no family history of hypokalaemic paralysis. Physical findings were normal, apart from proximal muscle paralysis of the legs and hypoactive deep tendon reflexes. There were no other signs of hyperthyroidism. His serum potassium was 2·5 mmol/L. He was treated with intravenous potassium, and within 6 h he was symptom free (potassium 3·2 mmol/L). As part of the evaluation of hypokalaemic periodic paralysis, thyroid function tests were done. Thyroid stimulating hormone was low (0·01 mU/L) and concentrations of free thyroxine and total triiodothyronine were high. Radioactive technetium uptake of the thyroid gland was high and uniform.

Because of recurrent attacks of paralysis, the patient was also initially treated with propranolol. 2 weeks after presentation he was given 370 mBq of ^{131}I. 1 week after this ablation, he had yet another episode of hypokalaemic paralysis. His T_3 and T_4 concentrations were still high. Potassium was given, and within a few days thyroid function tests became normal. There have been no further episodes of muscle paralysis during 8 months of follow-up.

Thyrotoxic hypokalaemic periodic paralysis occurs predominantly in Asian populations and is a complication rarely encountered in western countries.[2] The clinical and biochemical features of this paralysis are identical to those of familial periodic paralysis. In both disorders, patients—usually male—have recurrent flaccid weakness, mainly of the lower limbs. The hypokalaemia results from an intracellular shift of potassium. The symptoms resolve over a few hours as potassium moves out of the cells into the extracellular space. However, patients with thyrotoxic hypokalaemic periodic paralysis have attacks only when they are hyperthyroid. Graves' disease is the commonest cause of hyperthyroidism but any cause of thyrotoxicosis (including administration of exogenous thyroxine) may trigger attacks. Since clinical features of hyperthyroidism may be very subtle or absent in thyrotoxic hypokalaemic periodic paralysis, physicians should be alert to the existence of this entity.

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Hydroxyethylstarch and renal function in kidney transplant recipients

SIR—Cittanova and colleagues (Dec 14, p 1620)[1] report the effect of hydroxyethylstarch in brain-dead kidney donors on renal function in kidney-transplant recipients. They suggest that hydroxyethylstarch impairs immediate renal function in kidney-transplant patients. Furthermore, they indicate that several other reports support this notion.[2,3] I have some comments.

First, they used Elohes, but do not tell us about its half-life and bioavailability. From other compounds, such as antibiotics, which are excreted by the kidney, we know that the half-life of a substance is important and dosage has to be adjusted according to kidney function.[4] Elohes has a plasma half-life of 24 h and a bioavailability of 6–8 h. Haes-Steril, another hydroxylethylstarch, is characterised by a half-life of 3–4 h and a bioavailability of 3–4 h. The figures

for gelatine are 4–6 h and 2 h, respectively. Especially in intensive care, a longer half-life and bioavailability may have a striking effect on organ function, in particular when renal function is already impaired.

Second, for a general statement on the effect of hydroxyethylstarch one should compare results of studies with the same product in similar situations. I seriously doubt that comparing the effect of hydroxyethylstarch in pre-existing glomerular damage to an undamaged kidney in a donor, but not considering half-life and excretion of different compounds with respect to kidney damage is a sound scientific approach. Furthermore, information on the products used in cited work is missing.

Third, there are existing reports on beneficial effects of hydroxylethylstarch in intensive-care patients,[3] a situation in which kidney failure is imminent, and on donor organs, suggesting that the issue is more complex.

Last, several indices are regarded as physiological endpoints for organ donors: systolic blood pressure, central venous pressure, urine output, core temperature, packed cell volume, $Oxygen_2$-saturation, and pH. Have Cittanova and colleagues data for these indices? These workers also indicate a different fluid volume loading in the two groups. Maybe the described effects are caused by the differential fluid loading.

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1 Cittanova ML, Leblanc I, Legendre C, Mouquet C, Riou B, Coriat P. Effect of hydroxyethylstarch in brain-dead kidney donors on renal function in kidney-transplant recipients. *Lancet* 1996; 348: 1620–23.
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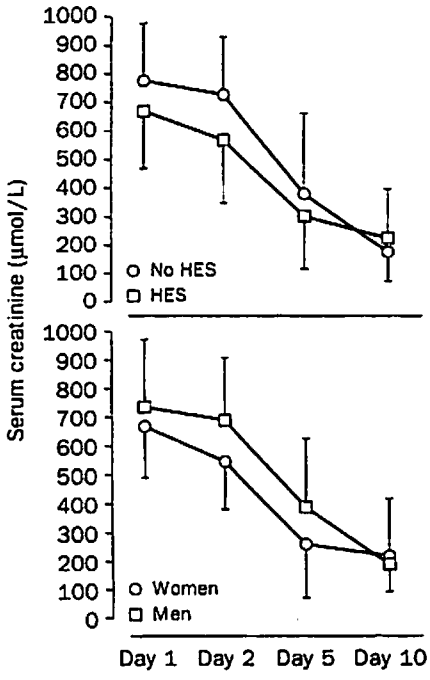
SIR—Cittanova and colleagues' report[1] has led us to review our data in 24 recipients of kidney grafts. We found no difference in the kidney-graft function at 1, 3, and 6 months post-transplantation, irrespective of hydroxyethylstarch use in brain-dead organ donors. The frequency of osmotic nephrotic-like lesions was also similar in those who had received hydroxyethylstarch and those who had not, and had no effect on



Creatininaemia in renal-graft recipients in first 10 days post-transplantation
Upper: hydroxyethylstarch (HES) compared with no HES (ANOVA test) for repeated measures, not significant.
Lower: men compared with women (ANOVA not significant).

kidney-graft function at these times after transplantation.[2] By contrast, Cittanova and colleagues recorded, during the first 10 days post-transplantation, reduced kidney-graft function with higher creatininaemia or more requirements for haemodialysis in recipients in the hydroxyethylstarch-gelatin group. In our study, creatininaemia in the first 10 days post-transplantation was lower in the hydroxyethlystarch group. This discrepancy between the two studies could be caused by the sex-ratio in Cittanova's hydroxyethylstarch-gelatin group which had more men than women. We therefore examined the sex ratio in our recipients, and there were 12 men and 12 women. Creatininaemia in the men was higher than in the women in the first 10 days post-transplantation and was equal thereafter (figure).

Thus, the differences between the two studies could be attributable to the sex-ratio of the groups of recipients. In the longterm, would the evolution of creatininaemia be similar in men and women, as Legendre and colleagues' results have suggested?[3]

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1 Cittanova M, Leblanc I, Legendre C, Mouquet C, Riou B, Coriat P. Effect of hydroxyethylstarch in brain-dead kidney donors on renal function in kidney-transplant recipients. *Lancet* 1996; 348: 1620–22.
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Authors' reply

SIR—Elohes has a low molecular weight (220 000), with a molar substitution ratio of 0·62. Since it is a polydispersified solution, its induced-blood-volume expansion is related to the medium half-life. Iguchi et al[1] studied the increase in plasma volume after a 500 mL infusion of Elohes. 24 h later, a 240 mL plasma volume expansion was still observed. This rather long half-life may be of concern with respect to renal toxicity. We are fully in agreement with Holzheimer that the effect of hydroxyethylstarch should be evaluated in similar situations. This is exactly what we did. Only in our discussion did we allude to the study of Waldhausen et al.[2] In our first report,[3] as well as in those of Hannemann[4] and Coronel and their colleagues,[5] the methods used were inappropriate to assess precisely whether hydroexyethylstarch was nephrotoxic; this is why we initiated a correctly designed, randomised trial, to provide strong data to resolve this important issue. All relevant indices, apart from central venous pressure, were compared in the groups, and no significant difference was noted. With respect to fluid loading, the difference in the two groups was not statistically significant and was therefore unlikely to account for the difference in renal function.

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