Albumin and meningococcal disease

Sir,

Dr Peters' editorial (Vol 61(2), 2000, p. 80) spells out the current feeling regarding the resuscitation of children with meningococcal disease and may be extrapolated to other critically ill children. It is quite clear that the publication of the Cochrane Injuries Group Albumin Reviewers' (1998) has put the cat among the pigeons regarding the optimal fluid for resuscitation of children with shock.

While 4.5% human albumin solution (HAS) has fallen out of favour in much of adult practice, being replaced by artificial colloid solutions, it has been widely used in paediatric practice. However, the widespread abandonment of 4.5% HAS should be avoided until it has been proven first, that 4.5% HAS is potentially dangerous and second, that there is a suitable alternative to be used as its replacement. While the Cochrane group stated that albumin use is potentially harmful and Dr Peters has highlighted some of the pitfalls with the systematic review that they produced, the reviewers did not come up with a suitable alternative nor did they give any reasonable explanation as to the mechanism by which albumin may be harmful.

There are major concerns regarding the use of large volumes of crystalloid fluid in patients with a capillary leak syndrome. Many studies have demonstrated that to get an equivalent volume enhancing effect, 4–5 times as much crystalloid solution as colloid needs to be used. Therefore, it appears that colloid replacement would be desirable in situations where there is a capillary leak syndrome such as in systemic sepsis. However, the artificial colloids currently available have been demonstrated to have either minimal advantage over crystalloid solutions or have an unacceptable rate of potentially adverse reactions.

Until this question is answered by a properly conducted control trial we and others feel that there is no reason at present to abandon the use of albumin in resuscitation of children with septic shock.

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Cochrane Injuries Group Albumin Reviewers (1998) Human albumin administration in critically ill patients: systematic review of randomised controlled trials. *Br Med J* **317:** 235–40

Thrombolysis in pulmonary embolism

Sir,

In their recent review of the clinical presentation and management of pulmonary embolism (PE), Wood and Spiro understate the case for thrombolysis in PE (Vol 61(1), 2000, p. 46).

As they note, thrombolysis achieves faster resolution of thrombus than anticoagulation alone. It has also been demonstrated that rapid clot lysis is associated with resolution of pulmonary hypertension and right ventricular afterload stress as demonstrated on echocardiogram (Goldhaber et al, 1993). While large scale trials demonstrating clinical benefit have not yet been performed, evidence is accumulating in favour of thrombolysis in PE for certain categories of patient: those with evidence of right ventricular dysfunction, those in cardiogenic shock and even those in cardiopulmonary arrest. Despite this thrombolysis rates appear to be very low: in the PIOPED study the rate was 6%, although registry data does suggest that this increases according to the clinical severity.

Right ventricular dysfunction may be visible on echocardiography within a few hours of PE, and while systemically normotensive. An analysis of this subgroup from the largest registry of pulmonary emboli so far (the MAPPET registry) showed a benefit of thrombolysis over anticoagulation alone in both reduced 30-day mortality (4.7% *vs* 11.1%) and reduced rate of recurrent PE (7.7% *vs* 18.7%); this was at the expense of increased bleeding episodes (but no consequent increase in mortality) in the thrombolysed patients (Konstantinides et al, 1997).

In cardiogenic shock secondary to proven PE the consensus is to thrombolyse unless there are major contraindications (British Thoracic Society, 1997). The benefit here is supported by registry data and limited trial data.

In cardiopulmonary arrest there have been three short case series and a number of case reports suggesting a benefit of thrombolysis in this group. Even allowing for reporter bias the initial survival rates of between 55% and 100% for three case series (n=20, 9, 5 respectively) compare very favourably with survival from pulseless electrical activity (PEA) arrest resulting from PE (Bottiger et al, 1994).

Pending the evidence of large scale randomized clinical trials, the above studies are useful indicators of those who are likely to benefit from rapid thrombolysis and in whom it may be life-saving.

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Bottiger BW, Bohrer H, Bach A, Mosch J, Martin E (1994) Bolus injection of thrombolytic agents during cardiopulmonary resuscitation for massive pulmonary embolism. *Resuscitation* **29:** 45–54

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Goldhaber SZ, Haire WD, Feldstein MI et al (1993) Alteplase *vs* heparin in acute pulmonary embolism: randomised trial assessing right ventricular function and pulmonary perfusion. *Lancet* **341:** 507–11

Konstantinides S, Geibel A, Olschewski M et al (1997) Association between thrombolytic treatment and the prognosis of haemodynamically stable patients with major pulmonary embolism. *Circulation* **96:** 882–8

The PIOPED investigators (1990) Value of the ventilator/perfusion scan in acute pulmonary embolism. *JAMA* **263:** 2753–9

Sir,

We are grateful to Drs Denniston and Bleetman for raising the very difficult issue about who, if anybody, should receive thrombolysis for PE. There is no doubt thrombolysis achieves faster resolution of thrombus and may be life saving but, in the long term, it adds little to the quality of eventual recovery. Certainly, it is a viable alternative to pulmonary artery thrombectomy which is only practised in very few centres.

Anecdotally, it is our practice to thrombolyse patients if they are in cardiogenic shock secondary to proven PE and, again, providing there is no major contraindication such as surgery within the previous 10 days or bleeding diatheses. Unfortunately, until there are controlled trials to show a definite advantage for early thrombolysis, it has to be the informed wisdom not to do it electively.

It is very difficult to visualize a sufficiently large multicentre study that will ever answer the question as to the proper place (if any) for thrombolysis in acute massive PE.

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