Granulocytopenia and septicaemia

Patients with severe granulocytopenia easily acquire Gram-negative septicaemia. This complication is justifiably feared: apart from fever, the physical signs are few, but if it is not treated early and appropriately it may rapidly progress to circulatory collapse and death.

Prevention might seem the best policy, but isolation and reversed barrier nursing have little to offer, since the organisms responsible are almost invariably endogenous. Sterilisation of the bowel with non-absorbable antibiotics probably delays the onset of infection and is widely practised, but even so most patients with severe granulocytopenia eventually become infected.

These infections progress so fast that there is no time to wait for results of bacteriological investigations, and treatment with antibiotics should be started as soon as specimens have been taken. Indeed many units dealing with patients with granulocytopenia recommend treatment of every fever of 38°C (or higher) that persists for more than two hours. Such a policy means that some transfusion or drug reactions will be treated inappropriately with antibiotics, which should be stopped as soon as infection is excluded.

The choice of antibiotics is empirical but not blind. The likely organisms are Escherichia coli, Klebsiella spp, or Pseudomonas aeruginosa. In patients with persistent granulocytopenia recovery is almost twice as likely as the organism is susceptible to two of the antibiotics administered rather than only one. Probably the most favoured regimen is gentamicin and carbencillin. A system of bacteriological surveillance which provides information about the patients' own flora and local drug resistances will be a valuable guide to the use of the newer aminoglycosides tobramycin and amikacin. Cephalothin is indicated if infection with Klebsiella is suspected.

One of the most important factors determining the chances of recovery is a spontaneous rise in the granulocyte count. Love et al. found a recovery rate of 93% in patients whose granulocyte counts rose by as little as 100 × 10⁹/l over the first 14 days of treatment compared with only 55% in those in whom the count remained unchanged. These statistics suggest that white-cell transfusions might be life saving. Should white cells be as freely available as red cells and platelets? The answer is logistic. The daily turnover of granulocytes in a non-infected adult is 1.2 × 10¹¹, with the mature neutrophil spending on average six hours in the circulation. During infections the turnover is greatly increased. Even to replace the normal daily requirement would mean transfusing the granulocytes from 80 units of fresh donor blood. Given these figures, white-cell transfusions might be expected to have little practical value. Nevertheless, despite earlier controversy, controlled trials have shown that daily infusions of 2 × 10¹⁰ granulocytes are effective in controlling Gram-negative septicemias in patients with initial granulocyte counts of less than 500 × 10⁹.⁸

Pancreatic transplantation

Treatment of insulin-dependent diabetes is meant not only to save life but also to achieve the best possible “control” of the blood glucose. Even with the best modern insulin regimens and new techniques of monitoring diabetic control, however, considerable fluctuations still occur in blood glucose concentrations. Better results can be obtained with continuous subcutaneous infusion of insulin, but both this technique and the use of the large and expensive artificial pancreas are still experimental. In theory, at least, the most effective solution to these problems should be pancreatic transplantation — last reviewed in 1976. Now a recent conference in California has been reported in a supplement of Diabetes.