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Cambridge score for small intestinal transplantation preoperative risk assessment

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The results of intestinal transplantation have considerably improved over the last 10 years⁽¹⁾ and it should now be considered routinely as a part of the management of patients with irreversible intestinal failure. Patients with complications arising during conservative management with parenteral nutrition (PN) should be referred before loss of venous access or other co-morbidity precludes the option of transplantation⁽²⁾. Pre-operative risk assessment is an important component in the decision to recommend transplantation. The complexity and variation of these procedures, which often involve multivisceral grafting, make risk quantification difficult and a scoring system has been developed to facilitate this process. Hitherto, such scoring systems have not been reported. A pre-operative scoring system for transplantation of the small intestine either alone or in combination with other organs has been developed and this system has been applied to a series of ten consecutive patients who have either been followed up post-operatively for ≥ 10 years or died. The score was generated by consideration of factors thought to influence the survival of this group of patients, who often have complex pathology and multi-organ disease or failure, and designed to combine risk factors for early, intermediate and late complications to generate an overall evaluation of survival chance for individual patients. Factors included in the score were loss of venous access points, failure or impairment of organs or systems that were not replaced or corrected by transplantation. Evaluations included cardiac, pulmonary, vascular, renal, hepatic, haematological and psychiatric co-morbidity. Each factor was scored 0–3. A score of 3 indicated that co-morbidity was considered to have an adverse impact on survival approaching that which would contraindicate the transplantation procedure. An abnormality that might lead to but was not currently an adverse risk factor scored 1 and that presenting a definite but moderate increase in risk scored 2. Active infection was scored according to the same assessment, taking into account severity, location and likely response to treatment. The sum of the scores for each factor was taken as the overall score for survival (CamScore). This latter score was calculated for each patient from their pre-operative records and compared with their subsequent survival.

A highly significant correlation was found between post-operative survival and 1/preoperative CamScore when analysed using Spearman's test for non-parametric linear correlation (r 0.87; $P=0.0016$). There appeared to be thresholds for pre-operative risk; a score of <3 was associated with survival >5 years and a score of >6 with survival of <6 months. This scoring system has also been applied pre-operatively to all five patients transplanted in Cambridge over the last 12 months. All had a CamScore <5 and all have survived and are PN independent. This scoring system provides an extent of quantification to the risk assessment of this very complex group of patients and may assist in the timing of referral for transplantation, in the selection of patients for transplantation and help focus on improving risk factors pre-operatively. This system should now be applied to a larger population of patients for further validation and development.

1. Middleton SJ & Jamieson NV (2005) *Gut* **54**, 1650–1657.

2. Fecteau A, Atkinson P & Grant D (2001) *J Pediatr Surg* **36**, 681–684.