Newsletter

Literature Reviews

The influence of perioperative blood transfusion on survival after esophageal resection for carcinoma.

Langley SM, Alexiou C, Bailey DH, Weeden DF. *Ann Thorac Surg* 2002;73:1704-1709.

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Metabolic, microbiologic, and immunologic complications are known to occur with blood transfusion. Recently, there has been increased attention placed on the association between blood transfusion and increased mortality. Although transfusion related immunomodulation has been implicated in increased risk of infection, cancer recurrence, and long-term mortality for patients undergoing resection of cancer or heart surgery, it is not clear that transfusion is a cause of mortality or a marker of a more complicated patient. Nevertheless, clinicians have appropriately adopted stricter transfusion practices and synthetic alternatives to blood transfusion are being investigated.

To assess the risks associated with blood transfusion, 41 variables were retrospectively analyzed to identify predictors of 30 day mortality in 234 consecutive patients who underwent esophagectomy by a single surgeon. The majority of patients had stage II and III cancers, 93% had a thoracoabdominal incision, 4.3% had an Ivor Lewis procedure, and 2.1% had a transhiatal incision. The mean surgical blood loss was 700 cc (range 412 to 7000 cc). Seventy-three patients (31.2%) did not receive blood transfusion in the perioperative period. One hundred and sixty one patients (68.8%) received blood transfusion. Thirty two patients received one unit, 71 received 2 units, 21 received 3 units, and 37 received more than 3 units. Operative mortality was 5.6% (13 patients). Six patients died of respiratory complications and 4 had complications related to anastamotic leaks. Other causes of death were cardiac and embolic. Survival rates were 58.1% at 1 year, 28.5% at 3 years and 16.1% at 5 years.

Tumor stage, cell type, weight loss, duration of cancer, male sex, positive lymph nodes, incomplete resection, and transfusion of more that 3 units of blood were univariate predictors for 30 day mortality. Multivariate analysis reduced the number of significant predictors of 30 day mortality to positive lymph nodes ($p = 0.001$), incomplete resection ($p = 0.0001$), and transfusion of greater then 3 units of blood ($p = 0.04$). The difference in survival at two and five years was significantly better for patients with complete resections (42.4% vs 7.2% and 20% vs 0% respectively). For patients transfused more than 3 units of blood, survival at 5 years was 10.0% compared to 17.5% for patients transfused 0 to 3 units of blood.

The authors concluded that there was a significant correlation between blood transfusion and outcome with a threshold found at 3 units transfused. However, it was noted also that outcome was also related to completeness of tumor resection and the presence of positive lymph nodes. The association between positive lymph nodes and incompleteness of resection with mortality was of greater significance and deserved more mention. Blood transfusion of greater then 3 units was associated with mortality with a p value of only 0.04. Furthermore, the wide range of blood loss during surgery suggests that the conduct of the surgical procedures may have varied significantly. The lack of a uniform transfusion policy and retrospective analysis were also potential limitations of the study. Although the authors concluded that the data supported a policy change to limit blood transfusion to only patients with hemoglobin levels less than 9 gm/dl, the

limitations of the study failed to discern whether blood transfusion was an independent risk factor for mortality or that blood transfusion was merely a marker for a high risk patient or one with advanced disease.