Preoperative Hemoglobin Predicts Adverse Events in Chronic Kidney Failure Patients Undergoing Cardiac Surgery

Fink, Daniel[1]; Hitti, Sharbel[1]; Tauber, Rachel[1]; Silberman, Shuli[1]; Merin, Ofer[1]; Bitran, Dani[1]; Shavit, Linda[2]

[1]Shaare Zedek Medical Center, Cardiothoracic Surgery, Jerusalem, Israel; [2]Shaare Zedek Medical Center, Nephrology and Dialysis Unit, Jerusalem, Israel

Background: Preoperative anemia adversely impacts outcomes in cardiac surgery. However, in the population of chronic kidney disease (CKD), correcting anemia to a "normal" hemoglobin has been associated with increased risks of adverse cardiac & cerebrovascular events. The question whether preoperative hemoglobin independently influences outcomes of cardiac surgery in patients with significant CKD has not been previously explored. Study aims: address this specific question & determine if there was a cutoff level of preoperative hemoglobin, above which, adverse surgical outcomes decrease.

Methods & Results: This observational study included adult pts. CKD Stage III-V (eGFR < 60 ml/min /1.73 m2) undergoing cardiac surgery. 788 patients with a mean plasma Cr. 1.9 ± 1.5 mg/dl were evaluated, of them 22.5% had preoperative hemoglobin within the normal range (14-18 g/dl male & 12-16 g/dl female). Patients were stratified into 4 subgroups according to preoperative hemoglobin levels: < 10 g/dl, 10-11.9 g/dl, 12-13.9g/dl & >14 g/dl. Outcomes were: postop. Acute Kidney Injury requiring dialysis, mortality & major morbidities. A gradual increment in the incidence of all adverse postoperative outcomes was detected for every 2g/dl decrement of preoperative hemoglobin. Multivariate logistic regression analysis demonstrated a continuous increase in the frequency of all adverse postoperative outcomes from the highest to the lowest preoperative hemoglobin (OR=31.6, p <0.0001 mortality, OR=17.2, p <0.0001 sepsis, OR=16.9; p<0.03, CVA and OR=31, p =0.005 postoperative hemodialysis). Subgroup analyses revealed preoperative hemoglobin < 12 g/dl as an independent risk factor for postoperative mortality (OR 2.6; 95%, p = 0.04).

Conclusions: Preoperative anemia adversely impacts postoperative outcomes in patients with significant CKD. Target levels of preoperative hemoglobin in CKD patients undergoing cardiac surgery should be higher than currently recommended in the non surgical setting.