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**Introduction:**
Red blood cells (RBC) transfusion is a common intervention in cardiac surgery and is associated with higher mortality rates and predisposes serious adverse events. The aim of this study was to determine whether red blood cells (RBC) transfusion is linked to long-term results after cardiac surgery.

**Methods:**
This observational retrospective study included all of the patients who underwent any of the STS defined elective cardiac surgery types from 2013 to 2014. We evaluated 3-5 year all-cause mortality rates and secondary postoperative outcomes defined by the STS risk prediction model. Patients were categorized according to whether they received RBC transfusions postoperatively; long-term results were compared using Cox-regression analysis and Kaplan-Meier method.

**Results:**
The overall rate of postoperative RBC transfusion for the study cohort of patients (67.8% males, median age 66 years [range, 59 - 73]) was 32.7% (n=210). Long term mortality rate was 12.3% (n=79), providing Kaplan-Meier mean survival estimates of 50.4 months in RBC group vs. 63.4 months in no RBC group (p=0.002). In a multivariate cox regression analysis adjusted for the preoperative EuroSCORE II value RBC transfusion remained as an independent predictor of mortality, OR=1.88 CI95%: 1.15-3.10, p=0.013. Secondary clinical outcomes analysis of STS outcomes revealed a higher rate of prolonged ventilation (22.8% vs. 3.1%, p<0.001), deep sternal wound infection (1.4% vs. 1.6%, p=1.000), renal failure (11.9% vs. 0.5%, p<0.001), stroke (5.2% vs. 1.2%, p=0.005) and surgical re-exploration (18.3% vs. 1.4%, p<0.001) in RBC group.

**Conclusion:**
RBC transfusions are associated with higher mortality and morbidity rates after cardiac surgery. Further studies are needed to determine whether these assumptions are based by the postoperative course of the patients.