

GST and HFABP Values During Machine Perfusion of Deceased Donor Kidneys are Independent Predictors of Delayed Graft Function, but not of Primary Non-Function and Graft Survival

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Introduction: Retrospective evidence suggests that glutathione S-transferase (GST) and heart-type fatty acid binding protein (HFABP) measured during kidney machine perfusion (MP) have predictive value for posttransplant outcome. However, these data are usually biased due to organ discard based on biomarker measurements, and previous analyses were not adjusted for likely confounding factors.

Methods: From 302 deceased donor kidneys included in an international prospective RCT (Machine Preservation Trial), GST and HFABP were measured in the perfusate at the end of MP. Donors were either heart-beating, or controlled non-heart-beating. We tested whether GST and HFABP levels were associated with delayed graft function (DGF), primary non-function (PNF), and graft survival (GS). A logistic regression model investigated whether the biomarkers remained independent predictors when adjusted for donor type, donor age, and cold ischemic time.

Results: For kidneys with DGF, median GST and HFABP concentrations were significantly higher (379 vs. 304 U/L, $p < 0.0005$, and 7325 vs. 5176 pg/ml, $p < 0.005$). In the logistic regression model, a GST or HFABP value above the median was independently associated with an increased risk of DGF (OR 2.0, $p = 0.03$, and OR 2.8, $p = 0.001$). There was no increased incidence of PNF in kidneys with high vs. low GST or HFABP values (1.4% vs. 3.4%, $p = 0.3$, and 2.0% vs. 2.6%, $p = 0.7$), neither was one year GS different (96% vs. 93%, $p = 0.2$, and 95% vs. 94%, $p = 0.8$).

Conclusion: This study for the first time shows that GST and HFABP in MP perfusate are independent predictors of DGF, but that these biomarkers do not predict PNF or GS. Although GST and/or HFABP values can be a valuable tool to help fine tune posttransplant management, measurement of these biomarkers should never lead to kidney discard.