

Background:

Pediatric heart transplant recipients have been found to be at an increased risk of developing renal insufficiency. The number of children who go on to develop chronic kidney disease (CKD) post-transplant is often underestimated and often diagnosed late (1). Bharat et al. found that 66% of pediatric heart transplant recipients had mild renal impairment five years post heart transplant. Feingold et al. found that mild renal impairment in children one-year post heart transplant to be a predictor of renal dysfunction later in life (defined as eGFR <60 mL/min/1.73 m²). The literature has demonstrated that there is a significant burden of renal dysfunction among pediatric heart transplant recipients and that it is a serious complication. Among the pediatric heart transplant population, children with renal failure have been shown to have 6 to 9 times increased risk of death compared to their counterparts. Calcineurin inhibitors have been attributed as one of the primary risk factors for renal dysfunction in the solid organ transplant population. However, there is limited literature identifying other risk factors for renal insufficiency. Pradhan et al. found an association between younger age at transplant and a larger decline in GFR (7). Although other studies have demonstrated conflicting results. Among adults, the development of hypertension after heart-lung or lung transplantation has been found to be predictor for end stage renal disease (4).

Proteinuria has been shown to be strongly associated with chronic kidney disease in children. It serves as a marker of either underlying glomerular disease or renal tubular dysfunction. It is known to play a role in the progression of chronic kidney disease as well. Similarly, higher blood pressures has been found to be associated with progressive decline in children with chronic kidney disease. In this study, we aim to identify the incidence of CKD five years post heart transplant among the pediatric population. In addition, we aim to evaluate whether hypertension and/or proteinuria are risk factors for CKD at this time period.

Objectives:

Objective 1: To identify the incidence of chronic kidney disease 5 years post heart transplant among pediatric patients

Objective 2: To evaluate whether proteinuria and/or hypertension are risk factors for chronic kidney disease 5 years post heart transplant among pediatric patients

Overall project methods:

This project will be a retrospective chart review looking at pediatric patients (infancy to 18 years old) who received a heart transplant at Morgan Stanley Children's Hospital between January 2009 to January 2017. This will be a continuation of Dr. Ruchi Mahajan's project assessing for risk factors for chronic kidney disease following pediatric heart transplant. Her project looked specifically at patients who developed acute kidney injury in the peri-operative period with follow up at 3 months, 1 year and 3 years post heart transplant, and found that the incidence of CKD at 3 years was only 10.8%. In this study, we will be expanding the follow up period to 5 years and expanding the patient population to include patients who did not develop AKI in the peri-operative period. We will also be specifically looking at hypertension and proteinuria as potential risk factors for CKD at this time point. Due to our limited sample size, we will be using decline in GFR as a surrogate marker for CKD.

References:

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