**ABSTRACT**

**Reduced Dose Anti-Thymocyte Globulin Induction Therapy for Kidney Transplant**

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**Background:** Kidney transplantation, the last line of therapy for patients with end stage renal disease, requires initial induction therapy to suppress the immune system, preventing organ rejection. The antilymphocyte agents used for induction at SNGH are rabbit anti-thymocyte globulin (rATG), a T-lymphocyte depleting agent, or basiliximab, an interleukin-2 receptor antagonist (IL-2 RA). Most patients undergoing transplantation at SNGH have a high immunological risk; therefore, rATG is utilized more commonly due to evidence demonstrating its superiority over basiliximab in preventing acute organ rejection. One downside associated with rATG use is a high risk for infections, and with the COVID-19 pandemic, alternate strategies are needed to decrease the likelihood of poor infectious outcomes. Due to these risks, Sentara Healthcare implemented a protocol using a reduced dose (RD) of 3-4.5mg/kg rATG for kidney transplant induction therapy compared to the previous standard dose (SD) of 6mg/kg.

**Objectives:** The primary objective was to determine if RD rATG is non-inferior to SD rATG for survival free from rejection within one year of kidney transplantation. Secondary endpoints included a comparison of the incidence of infection as well as patient survival. Renal function and tacrolimus levels at 3, 6, 9, and 12 months were also assessed. Other secondary endpoints included hospital length of stay (LOS), readmission within 30 days, delayed graft function, and graft survival.

**Methods:** This was a retrospective, single-center pre-post (June 2017-July 2018 vs. May 2020-February 2021) non-inferiority study including patients aged 18-72 who received a kidney transplant with single-day rATG induction therapy at SNGH.

**Preliminary Results:** For the primary objective of survival free from rejection at one year, there was no difference between the RD and SD regimens (84.5% vs.88.2%, p=0.495). There was also no difference in mortality at one year (7.0% vs. 3.2%, p=0.294), nor in delayed graft function, readmission within 30 days, hospital LOS, tacrolimus levels, or renal function throughout the first year. The median cost of rATG was $13,998.72 in the RD group and $24,497.76 in the SD group, which was a significant cost savings (p<0.0001). RD patients had a higher incidence of SARS-CoV-2 infection (11 cases, 15.5%), whereas the SD group was not exposed to the virus. Rates of BK and CMV did not differ significantly.

**Conclusion:** The 3-4.5mg/kg RD of rATG is an acceptable alternative to the 6mg/kg SD in a high-risk patient population, as it was shown to have equivalent rates of rejection with a significant cost reduction. Further studies comparing the two dosing regimens during the COVID-19 pandemic may be warranted.

**Keywords:** rATG (rabbit anti-thymocyte globulin), rejection, COVID-19, RD (reduced dose), SD (standard dose), CMV (cytomegalovirus)