

# KSN 2016 Abstract Submission

## *Transplantation & Immunology*

KSN2016ABS-1529

### **Prediction of Graft Survival in Kidney Transplant using a Multicenter Cohort**

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**Background:** Accurate predict of graft survival has important implications for clarifying the benefits of transplantation. However, the complexity and heterogeneity of risk factors on allograft survival were remained. Here, we aimed to build new prediction models through considering variables related to immunologic and non-immunologic factors using machine learning methods

**Methods:** This multicenter cohort study included adult KTR admitted to 2 major experienced tertiary hospitals in Korea between 1997 and 2014. A total of 3,117 KTRs were enrolled. Allograft survival of these recipients was investigated by the individual learners such as survival decision tree, cox regression, survival ridge/lasso regression, and ensemble learners such as survival Bagging and random forest

**Results:** We analyzed 3,117 recipients' records, with more than 50 attributes. Among them, we chose 33 independent attributes which could affect graft survival for building our models.

In the survival decision tree model using graft survival duration, acute rejection episode within the first year was found to be the best prediction model for test dataset (Concordance index 0.808). In the case of having rejection episode in the first year, risk of graft failure was predicted in 4.27 times compared to overall recipients. Serum creatinine at three month after transplantation, and also recipient's age showed significant association with allograft survival. In recipients without rejection episode, creatinine cut-off value over 1.65 mg/dl showed high probability of graft failure (HR 3.001).

Moreover, final survival decision tree modeling revealed that mismatch DR and low serum Na (135mmol/L) at three month after transplant affect allograft survival.

**Conclusion:** In this study, reducing acute rejection episode at the first year following the transplant might had been most important factor for allograft survival. Machine learning modeling could present an accurate and versatile tool for forecasting graft survival

**Keywords:** Graft Survival