**Abstract**

We previously reported that two B cell receptor genes, IGKV1D-13 and IGKV4-1, were associated with tolerance following kidney transplantation. To assess the potential utility of this "signature" we conducted a prospective, multicenter study to determine the frequency of patients predicted tolerant within a cohort of patients deemed to be candidates for immunosuppressive minimization. At any single time point 25 - 30% of patients were predicted to be tolerant, while 13.7% consistently displayed the tolerance "signature" over the two-year study. We also examined the relationship of the presence of the tolerance "signature" on drug usage and graft function. Contrary to expectations, the frequency of predicted tolerance was increased in patients receiving tacrolimus and reduced in those receiving corticosteroids, MMF, or Thymoglobulin as induction. Surprisingly, patients consistently predicted to be tolerant displayed a statistically and clinically significant improvement in eGFR that increased over time following transplantation. These findings indicate that the frequency of patients consistently predicted to be tolerant is sufficiently high to be clinically relevant and confirm recent findings by others that immunosuppressive agents impact putative biomarkers of tolerance. The association of a B cell-based "signature" with graft function suggests that B cells may contribute to the function/survival of transplanted kidneys. This article is protected by copyright. All rights reserved.

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