Gene Expression Profiling for Cardiac Transplant Recipients: Results from the Outcomes AlloMap® Registry

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Introduction

The Outcomes AlloMap Registry (OAR) is a prospective, observational registry for heart transplant patients being managed with AlloMap® gene expression profiling (GEP). The OAR allows insights into the real world outcomes of patients managed with GEP as a part of the surveillance strategy. The OAR is the first heart transplant registry to focus on GEP. Transplant registries may facilitate collection of comprehensive and unbiased real-world data to enhance the available body of evidence on short and long term outcomes of patients[1]. We share the results of patients managed with GEP using the OAR.

Methods

1938 heart transplant patients from the 36 transplant centers in OAR were studied. This ongoing, prospective, observational registry study includes heart transplant recipients who received GEP testing as part of standard rejection surveillance. Baseline clinical risk factors, clinical status, medications, diagnostic test results and graft function were collected from 4/2013 to 2/2018.

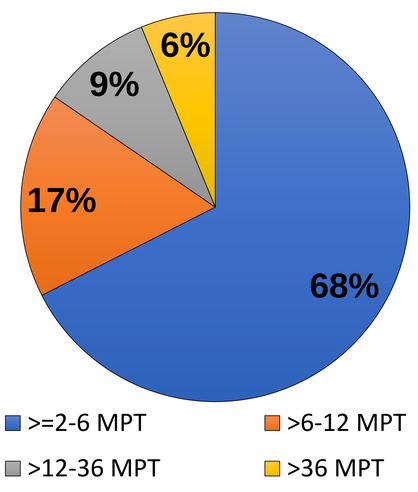
Results

In 1776 patients (pts) with 9455 visits, baseline recipient demographics at time of first study visit are in Table 1. 284 pts (17%) discontinued steroids in the study with 18% in m ≥2-6, 46% in m ≥6-12, 36% in m ≥12.

Table 1: Baseline Recipient Characteristics

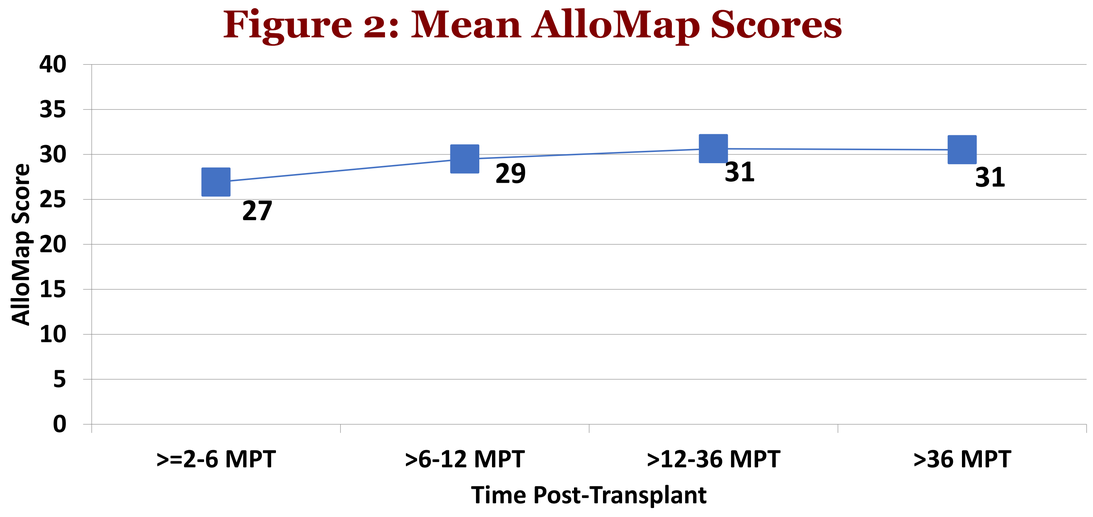
Characteristics	N=
Age, Enrollment Mean (range)	55 (18-87)
Race, n (%)	
Caucasian	1134 (70.04)
Black	312 (19.3)
Hispanic	98 (6.1)
Asian	42 (2.6)
Other	33 (2)
Male	955 (59)
Male--->Female	178
Female--->Male	117
PRA >10%, n (%)	191 (14)
Pre-transplant Mechanical Support, n (%)	838 (52)

Figure 1: OAR Study Entry



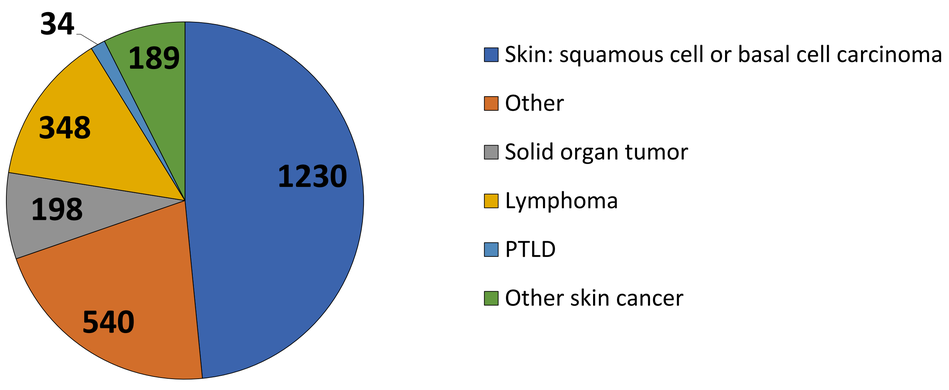
85% of patients entered the study in the first year post-transplant.

Figure 2: Mean AlloMap Scores



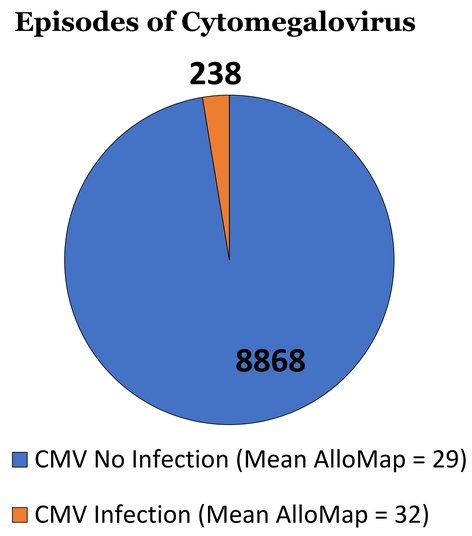
Mean AlloMap scores are lower in the first year post-transplant, compared to >12 MPT, where the mean scores are higher and consistent across time periods > 12 MPT.

Figure 3: Episodes of Cancer Diagnosed During Study



There were 2539 study visits in 108 patients where an episode of cancer was diagnosed. 48% non-melanoma skin cancers, 14% lymphoma and 8% solid organ.

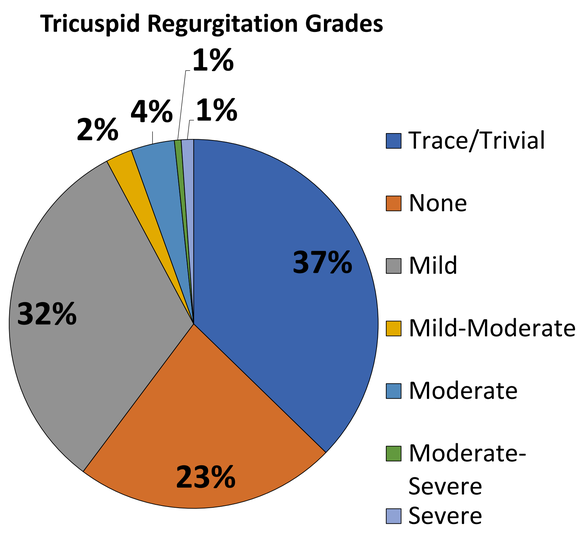
Figure 4: Cytomegalovirus Serology and Infections



Pre-transplant CMV Serology	Study Visits	Patients with CMV Infection
D-/R-	322	3
D-/R+	334	14
D+/R-	415	75
D+/R+	617	68

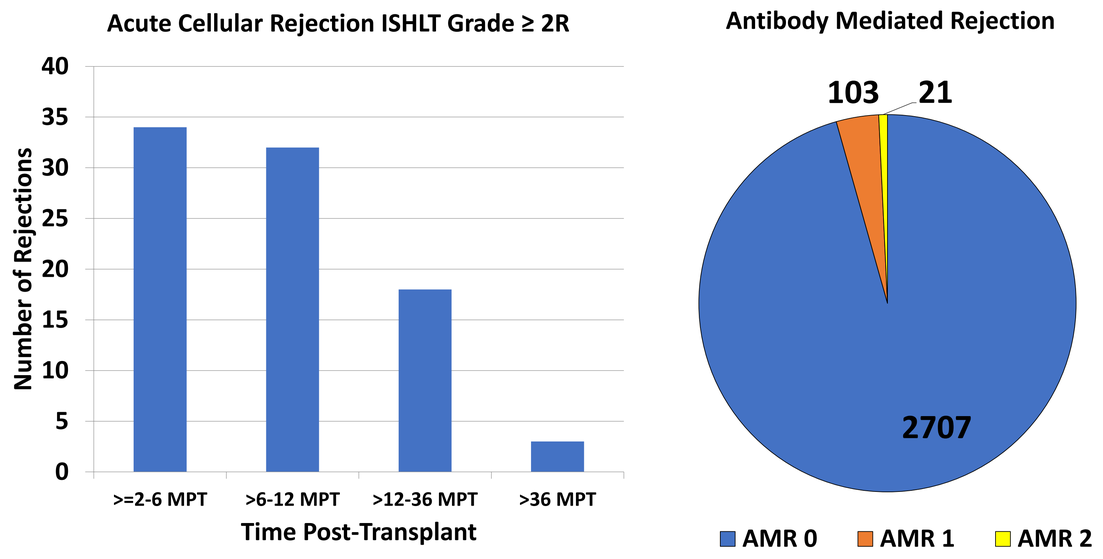
Mean AlloMap scores tended to be higher in patients with CMV infection than those patients without CMV infection. 89% resulted from CMV D+ patients and 11% CMV D- patients.

Figure 5: Echocardiograms and Tricuspid Regurgitation



7764 echocardiograms were done during 9455 study visits. There were 2098 in m ≥2-6, 2703 in m >6-12, 2962 in m >12. The majority resulted in trace to mild grades of tricuspid regurgitation.

Figure 6: Rejection Episodes During Study



	>=2-6 MPT	>6-12 MPT	>12-36 MPT	>36 MPT
Total EMBS	1710 (2%)	1396 (2%)	940 (2%)	192 (2%)

There is a low diagnostic yield of rejection on biopsy with 87 episodes of ACR grade ≥2R, 103 cases AMR1 and 21 cases of AMR2 out of 4238 total biopsies.

Table 2: Hospitalizations Between Study Visits

Diagnosis	N, %
Other	568, 59%
Infection	229, 24%
Rejection	69, 7%
Graft dysfunction,Cardiac allograft vasculopathy (CAV)	17, 2%
Cardiac allograft vasculopathy (CAV)	7, 1%
Graft dysfunction	6, 1%

971 interval hospitalizations occurred between 9381 study visits with infection occurring more frequently than rejection, CAV or graft dysfunction.

Conclusions

This report from the OAR demonstrates that the majority of surveillance GEP testing is initiated in the first-year post-transplant. Hospitalizations occurred more often for infection and cancers and were more common than rejection episodes. These findings may suggest patient outcomes could be improved with individualized tailoring of immunosuppression, warranting future research.

References

1. Liu FX, Rutherford P, Smoyer-Tomic K, Prichard S, Laplante S. A global overview of renal registries: a systematic review. *BMC Nephrology*. 2015;16:31. doi:10.1186/s12882-015-0028-2.

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