

**Purpose:** Major blood loss is life-threatening in patients undergoing heart transplant surgery (OHTS) especially if preceded by LVAD explant surgery. FFP is used to supplement clotting factors, prophylactically before, & therapeutically during & after surgery. However transfusion of large volumes of FFP is associated with complications such as TACO, TRALI & RV failure, in these patients with heart failure. PCCs, containing clotting factors (II, VII, IX & X) in much smaller volumes than FFP, have been used prior to surgery to reverse vitamin K antagonist therapy & to decrease perioperative bleeding. However, a minimally effective dose needs to be described in clinical effectiveness trials.

**Methods:** We studied the charts of patients at our hospital that underwent OHTS between January 1, 2013 & Sept 30th 2015. Preoperative patient factors and intraoperative process factors that could potentially lead to excessive bleeding were studied along with other postoperative outcomes. In patients undergoing OHTs, we sought to determine whether the use of PCCs had an impact on reducing postoperative blood loss or transfusion or their associated complications.

**Results:** Among the 39 patients that underwent OHTS in this time period, the average 24-hr postoperative blood loss (mediastinal drainage) in the 21 patients who received PCC was 1068 ml, compared to 1047 ml, in 18 patients who did not receive PCC.

PCCs were used as a rescue treatment after conventional therapy using FFP, Cryoprecipitate and Platelets failed to secure adequate hemostasis. The decision to use PCCs was made intraoperatively by the operative team following the reversal of heparin with protamine.

**Conclusion:** Patients who received PCCs were perhaps at higher risk of bleeding & may not be comparable to those who did not receive PCCs.

Patients who received PCCs after failure of conventional therapy, had similar outcomes to those treated conventionally. Perhaps PCCs should be used earlier in the course of therapy.

Patients who received PCC during Heart Transplant Surgery

|                                                                            | Patients treated with FFP, Cryoprecipitate and Platelets, n=18 | Patients treated with conventional treatment + PCCs, n=21 |
|----------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------|
| Preexisting VAD at the time of OHTS                                        | 11/18                                                          | 15/21                                                     |
| Redo Sternotomy                                                            | 12/18                                                          | 19/21                                                     |
| Mean RBC volume in ml transfused during surgery                            | 486                                                            | 1997                                                      |
| Number of patients who were transfused RBCs during surgery                 | 9/18                                                           | 20/21                                                     |
| Mean FFP volume in ml transfused during surgery                            | 862                                                            | 1437                                                      |
| Mean 24-hr postoperative mediastinal drainage in ml                        | 1047                                                           | 1068                                                      |
| Average Duration of Postoperative Mechanical Ventilation in hours (Median) | 17.17                                                          | 25.29                                                     |
| Average Hospital length of stay in days ( median)                          | 15                                                             | 18                                                        |
| Number of patients Discharged to home, rehab or home health care           | 16                                                             | 20                                                        |
| Death before discharge (number of patients)                                | 2                                                              | 1                                                         |

799

#### Patients Save Lives: Donor Designation at the PCP Office

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**Purpose:** About 123,000 people are awaiting organ donation in the US and while 18 people die each day waiting for a transplant, one organ donor can save up to 8 lives. Currently, less than half of the licensed drivers in Pennsylvania and West Virginia are registered organ donors. There is significant evidence that myths, misinformation and the perceived limited opportunity for registration are casual factors in this situation.

**Methods:** The 'Patients Save Lives' (PSL) pilot program was conceived as an opportunity to move the dialogue into a healthcare setting and create an easy opportunity to get reliable organ donation information with access to

registration during routine visits to the primary care physicians (PCP). It was initially funded through a Health Resources and Services Administration grant awarded to the University of Pittsburgh Department of Health Policy & Management and the Center for Organ Recovery & Education (CORE). Between January and June 2015, the project provided CME-accredited education about organ donation for physician office staff in 122 randomized participating clinics across Western Pennsylvania and West Virginia. This included online and in-person training (lunch and learns) to over 1,500 PCP office staff participants as well as PCP office kits that included tabletop posters, brochures and office forms which included a survey and designation form.

**Results:** Over 21,000 patient-completed organ donation survey forms were collected. About half of all participants were already registered organ donors. 764 (8.1%) completed the designation form and became registered organ donors upon receiving information from this pilot project. Due to the program's success, both Organ Procurement Organizations in Pennsylvania (CORE and Gift of Life) have committed to funding the program as a state-wide initiative, to be launched in January 2016.

**Conclusion:** Unique initiatives like the PSL project can help create awareness amongst people regarding the critical value of organ donation.

800

#### Cardiac Surgery after Heart Transplantation - Elective Operation or Last Exit Strategy?

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**Purpose:** Improved survival after cardiac transplantation with better long-term outcome as well as transplantation of marginal donor hearts may lead to late pathologies in the graft that might need surgical intervention. The aim of this study was to evaluate risk factors for cardiac surgery after heart transplantation and associated morbidity and mortality.

**Methods:** In this retrospective, single-centre study, we evaluated patients that underwent cardiac surgery after cardiac transplantation at our institution.

**Results:** Between March 1984 and September 2014, 17 (1,24%) out of 1369 cardiac transplant patients underwent cardiac surgery after transplantation. Indication for surgical intervention was valvular disease in 41,2% (n=7), graftvasculopathy in 29,4% (n=5), infectious aortic pseudoaneurysma 5,9% (n=1), aortic dissection 5,9% (n=1), ventricular assist device implantation 5,9%(n=1), pericarditis constrictive 5,9%(n=1), iatrogen coronary artery dissection 5,9% (n=1). 82,4% (n=14) were male, 17,6% (n=3) female. Median time to surgery after transplantation was 9,4 years (2,7-11,3). Return to theatre was necessary due to bleeding in 3 patients. In hospital mortality was 11,8% (n=2), need of re-transplantation was 11,8% (n=2) due to graftvasculopathy 3 and 9 month after operation. Median survival after surgery was 506 days (242-2884), 47,1% (n=8) are still alive. 17,6% (n=3) were emergency procedures, 82,4% (n=14) were elective cases. In hospital mortality for emergency operations was 66,7% (n=2), for elective operations 0% (n=15).

**Conclusion:** In comparison to other studies, the incidence of cardiac surgery after transplantation in our cohort was low (1,24%). In elective operations, survival was good but emergency surgery had a high in hospital mortality.

801

#### Population Profile Submitted to Cardiac Transplantation in a Brazilian Hospital: Comparison Involving the Registry of ISHLT

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**Purpose:** Demonstrate the characteristics of patients who underwent heart transplantation in a Brazilian service and compare it to the ISHLT registry.

**Methods:** Data from patients who have a heart transplant at our hospital from September 2007 to October 2015 were evaluated, emphasizing the hemodynamic support used: intravenous inotrope, intra-aortic balloon pump and/or mechanical circulatory support. We compared our data to the registry of ISHLT.

**Results:** 75 heart transplants were performed at our institution between September 2007 to October 2015; most patients were male (73.3 %) and the

main etiology was idiopathic dilated cardiomyopathy (36%), also followed by ischemic cardiomyopathy (22.7%) and by Chagas cardiomyopathy (22.7%). Almost all patients were hospitalized at the time of transplantation (96 %) and in use of intravenous inotrope, of these 33.3% were also with IABP and only 6.7 % used some mechanical circulatory support, such as ECMO and centrifugal pump (CENTRIMAG). The comparison with the data from the ISHLT is below and all showed statistically significant difference ( $p < 0.001$ ). **Conclusion:** Our population differs from the registry of ISHLT, since the vast majority of patients are hospitalized at the time of transplant, in use of intravenous inotrope and / or intra-aortic balloon, rarely in use of circulatory assist device. These data suggest that in our population patients are transplanted in advanced stages of heart failure, rarely with mechanical circulatory support other than IABP as a bridge to transplant.

| Variable                           | Our hospital |      | ISHLT |      | p      |
|------------------------------------|--------------|------|-------|------|--------|
|                                    | N            | %    | N     | %    |        |
| Hospitalized at time of transplant |              |      |       |      | <0.001 |
| Yes                                | 72           | 96.0 | 8659  | 43.8 |        |
| No                                 | 3            | 4.0  | 11111 | 56.2 |        |
| On IV inotropes                    |              |      |       |      | <0.001 |
| Yes                                | 72           | 96.0 | 7888  | 39.9 |        |
| No                                 | 3            | 4.0  | 11882 | 60.1 |        |
| IABP                               |              |      |       |      | <0.001 |
| Yes                                | 25           | 33.3 | 1226  | 6.2  |        |
| No                                 | 50           | 66.7 | 18544 | 93.8 |        |
| Mechanical circulatory support     |              |      |       |      | <0.001 |
| Yes                                | 5            | 6.7  | 8106  | 41.0 |        |
| No                                 | 70           | 93.3 | 11664 | 59.0 |        |

## 802

### Recipient Related Predictors of Mortality after Heart Transplantation: Results from a Contemporary Irish National Cohort

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**Purpose:** Orthotopic Heart Transplantation (OHT) remains the optimal therapy for advanced symptomatic heart failure. Assessing outcomes is important, not only to the transplant centre but also to the referring heart failure services, to optimize and align expectations. Alongside advances in care older and more complex patients are being transplanted therefore it is important to validate survival in a contemporary cohort. We sought to assess the outcome following OHT in our contemporary cohort and to identify recipient risk factors of poor outcome. Diabetes, renal disease and advanced age at transplantation are all identified in the literature as predictors of poor outcomes post transplantation.

**Methods:** A systematic analysis of all patients (n=100) transplanted in the ten-year period 2004-2013 attending follow up in the Irish OHT clinic was performed. This included patients transplanted in the Irish programme and young adults transitioned to the programme following paediatric OHT in the UK. Review of patient records together with laboratory data allowed completion of a standardized dataset for each patient. Survival was determined with reference to the clinical records. Statistical analysis was carried out with SPSS. Survival curves were generated and the log-rank scale used to compare survival amongst groups.

**Results:** Baseline characteristics are shown in table 1. One-year survival was 85% with death occurring in 25 patients, all surviving patients remained free of re-transplantation at the end of the period. Univariate determinants of increased mortality included female gender and CKD class at transplantation, but not age at transplantation or diabetes. Early deaths occurred more frequently in the ischaemic cohort, however they had a superior long-term survival ( $p = 0.018$ ).

**Conclusion:** Our survival rates are in keeping with published data. We only identified renal impairment and female gender as predictors of poor outcome perhaps due to small numbers in our cohort.

| Baseline Characteristics        | N               |
|---------------------------------|-----------------|
| <b>Sex</b>                      |                 |
| Male                            | 66              |
| Female                          | 34              |
| <b>Age at transplant yrs</b>    |                 |
| Mean +/- SD                     | 46.39 +/- 14.56 |
| <b>Underlying diagnosis</b>     |                 |
| Ischaemic                       | 23              |
| Non Ischaemic                   | 77              |
| Dilated Cardiomyopathy          | 68              |
| Hypertrophic Cardiomyopathy     | 7               |
| Restrictive Cardiomyopathy      | 2               |
| <b>Pre transplant eGFR</b>      |                 |
| Mean +/-SD                      | 66.5 +/- 25.5   |
| <b>Pre Transplant CKD Stage</b> |                 |
| I                               | 16              |
| II                              | 37              |
| III                             | 40              |
| IV                              | 3               |
| Not available                   | 4               |
| <b>Pre Transplant Diabetes</b>  |                 |
| Diabetic                        | 17              |

## 803

### Comparison of the Clinical Outcomes After De-Novo Heart Transplantation Between Adults with and without Congenital Heart Disease

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**Purpose:** The population of Adult Congenital Heart Disease (ACHD) patients requiring heart transplantation is expanding but there are few published results for outcomes. Controversy over organ allocation to ACHD exists as they may have higher perioperative risk, particularly single ventricle/Fontan patients. Therefore we examined the UK NHSBT Registry data to assess ACHD outcomes.

**Methods:** Adults (aged >16 years) undergoing a first heart transplant between 1995-2014 were identified. Registration-, operative- and post-transplantation-related clinical data were compared between adults with congenital heart disease (ACHD) and other adult de-novo heart transplant recipients. Post-transplant survival was compared between the groups using the Kaplan-Meier method. The ACHD sub-group registered between 2005-2014 were analysed to assess the impact of complex (single ventricle) morphology on survival using the log rank test.

**Results:** ACHD patients were younger and less likely to be male, waiting times were longer and mechanical circulatory support less common. Although early survival was worse the 1 year creatinine was better and the long term outcomes were similar. In the recent era 2005-2014 there were 74 transplants for ACHD 25 of which were single ventricles. Comparing single ventricles with bi-ventricles, one-year post-transplant survival was similar (95.9% single ventricle vs. 93.5%), ( $p=0.4$ ). Fontan survival was 89.7% at 4-years post-transplantation. Note that these analyses are not risk-adjusted.

**Conclusion:** Despite ACHD having worse 90-day survival, long-term post-transplantation survival was comparable between ACHD de-novo heart transplant recipients and those with other diagnoses. In the recent era single