

Donor-Recipient Factors Influencing Early Antibody Mediated Rejection in Children



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BACKGROUND

- Donor hearts encounter multiple inflammatory states during the transplant (tx) process that can initiate an innate immune response and lead to subsequent rejection and poor cardiovascular outcomes.
- Adult studies have identified donor factors that are associated with increased risk of mortality – including increased donor age, gender mismatch, mechanism of death, and ischemic times that have not necessarily translated similar risk to the pediatric population.¹

OBJECTIVE

- Assess both donor and recipient factors associated with early antibody mediated rejection (AMR) in pediatric recipients with a negative crossmatch at the time of transplant

METHODS

- Pediatric transplant records (pts < 19 yrs) from Primary Children’s Hospital between 2007-2017 were matched with donor information from UNOS database for analysis
- Early AMR was defined as any biopsy in the first 90 days after transplant with histologic or immunopathologic evidence of rejection based on current pathology guidelines.²
- Exclusion criteria: Dual organ tx, re-tx, positive crossmatch
- Analysis utilized chi-square and Wilcoxon rank sum testing of the following:

Donor factors

- Gender
- Mechanism of death
- Hospital LOS
- Need for transfusion
- Hx of ventricular dysfxn
- Hematologic values
- Donor preservative fluid
- Age
- Downtime
- Troponin levels
- Hx of substance abuse
- Need for inotropic support
- Infectious markers
- Cold ischemic time

Recipient factors

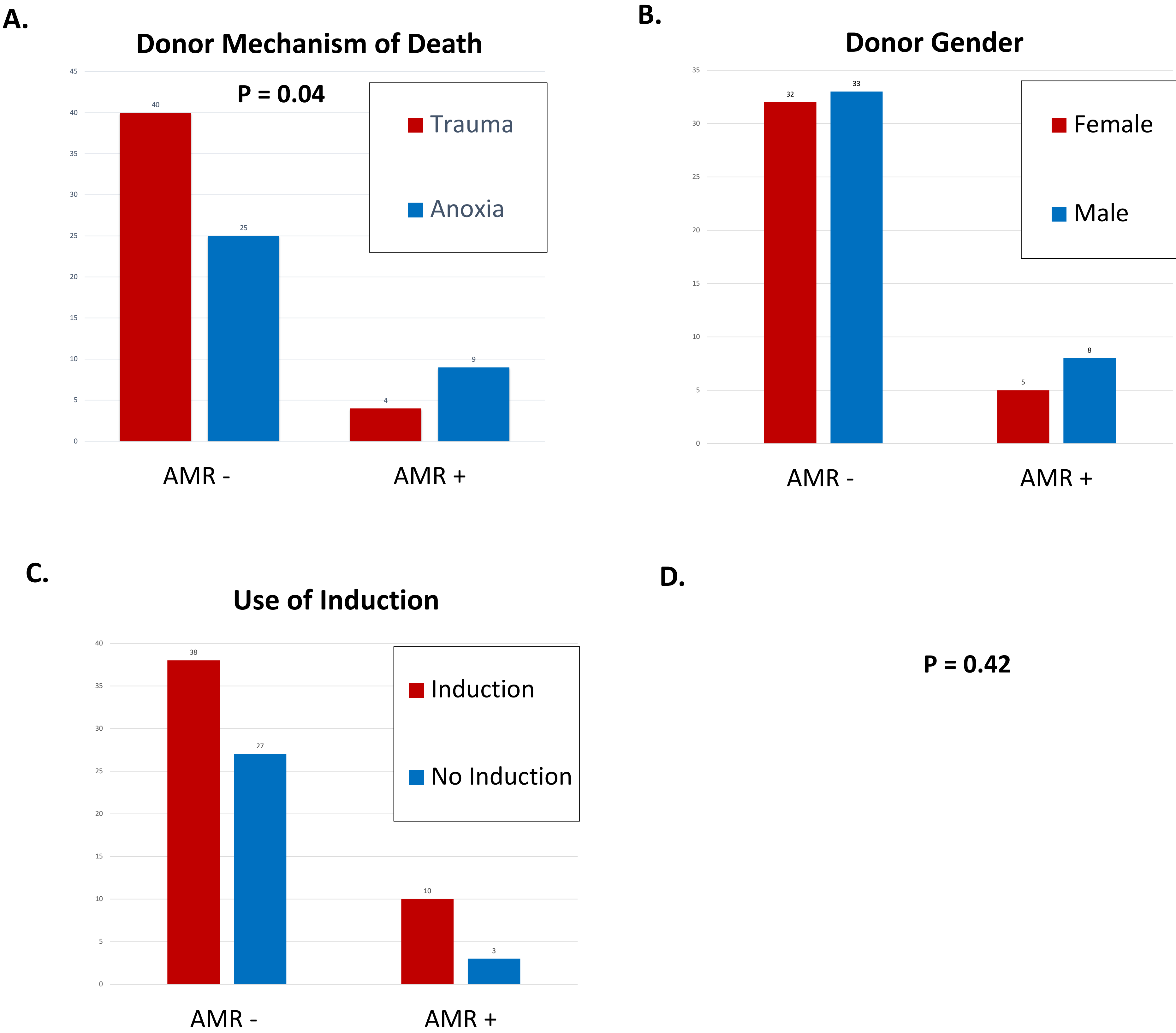
- Gender
- Tx indication
- VAD/ECMO support
- Induction use
- DSA development
- Age
- Listing status
- PRA
- Biopsy score
- CV death

RESULTS

Table 1- Demographics

Transplant Recipients	78 pts
Age (median, range)	2.7 yrs (1 mo-18 yrs)
Gender (male)	41 (53%)
Tx indication:	
-- Congenital heart disease	40 (51%)
-- Cardiomyopathy	37 (47%)
-- Arrhythmia	1
Need for ECMO/VAD	6 (pre); 2 (post)
Induction use	48 (62%)
Early AMR in 1 st 90 days	
Single episode	24 pts (31%)
Two or more episodes	13 pts (17%)
Treated AMR	3 pts (4%)
Subsequent CV graft death	6
DSA development in 1 st yr	8
Donor characteristics	
Age (median, range)	6.8 yrs (1 mo – 28 yrs)
Gender matching (M)	39 (50%)
F → F	17
F → M	20
M → M	22
M → F	19
Mechanism of Death	
Trauma/Injury	44 (56%)
Head trauma/NAT	17
Motor vehicle accident	20
Gun shot wound	7
Anoxia	34 (44%)
Drowning	5
SIDS/seizure/hanging/choking	29
Hx of ventricular dysfunction	10 (13%)
Abnormal troponin at tx	10 (13%)

Figures A-D. Associations with 2 or more episodes of early AMR



CONCLUSIONS

- Clinically significant early AMR is rare in this crossmatch negative, single center pediatric cohort
- Only anoxic donor death was found to be associated with early AMR
- Hormonal contributions to the inflammatory cascade in adult donors and recipients compared to the pediatric population may account for differences seen in these unique populations
- Additional analysis in a larger pediatric multicenter study may help further elucidate important contributors to inflammation and subsequent cardiac injury for this transplant population

DISCLOSURES

- The authors have no disclosures

REFERENCE

- ¹Conway J, Chin C, Kemna M, et al. Donors’ characteristics and impact on outcomes in pediatric heart transplant recipients. *Pediatr Transplantation* 2013; 17: 774- 781.
- ²Colvin MM, Cook JL, Chang P, et al. Antibody-mediated rejection in cardiac transplantation: Emerging knowledge in diagnosis and management: A scientific statement from the American Heart Association. *Circulation* 2015; 131: 1608-1639.