Association Between Angiotensin II Antagonism and Mortality After LVAD Implantation: A Multicenter, Contemporary Analysis

Jessica Schultz, MD
Senior Co-Author: Rebecca Cogswell, MD

Barry Trachtenberg, MD; Kevin Goodwin, MD; Rachel Araujo, MD; Abdel El Rafei, MD; Jerry Estep, MD; Tamas Alexy, MD/PhD; Andrew Shaffer, MD; Ranjit John, MD

HEALTH
University of Minnesota Medical Center

HOUSTON Methodist
LEADING MEDICINE

Relevant Financial Relationship Disclosure Statement

Association Between Angiotensin II Antagonism and Mortality After LVAD Implantation: A Multicenter, Contemporary Analysis

Jessica Schultz, MD

I will not discuss off label use and/or investigational use of any drugs/devices.

The following relevant financial relationships exist related to this presentation:
Jessica Schultz, MD: No relationships to disclose
Barry Trachtenberg, MD: Abbott: consultant
Kevin Goodwin, MD: No relationships to disclose
Rachel Araujo, MD: No relationships to disclose
Abdel El Rafei, MD: No relationships to disclose
Jerry Estep, MD: ***
Tamas Alexy, MD/PhD: No relationships to disclose
Andrew Shaffer, MD: No relationships to disclose
Ranjit John, MD: Abbott: consultant and research grants. Medtronic: consultant and research grants
Rebecca Cogswell, MD: Abbott: Speakers bureau and consultant. Medtronic: Advisory board, consultant, and husband's employer

Background

- Known ACEI or ARBs have proven benefit in HFrEF
- Noticed not all patients on LVAD support remain on ACEI/ARBs
- Little data to show ongoing mortality benefit once on LVAD
- To determine the association between ACEI or ARB use and post LVAD mortality in a large, multicenter, contemporary CF dataset inclusive of HeartMate 3 devices

HEALTH
University of Minnesota Medical Center
HOUSTON Methodist LEADING MEDICINE

Methods

- 2 centers with a 1st time cf-LVAD implants with complete medication and survival outcome data were included
  - Total n=648
- ACEI/ARB utilization was defined as use at index discharge or within the first 3 months after implantation
- A multivariate cox regression was performed to test the association between ACEI/ARB use and post LVAD mortality

HEALTH
University of Minnesota Medical Center
HOUSTON Methodist LEADING MEDICINE

Baseline Characteristics

Variables	UMN (n=411)	Houston Methodist (n=237)	p-value
Age	58 +/- 14	57 +/- 12	0.906
Male	331 (80.5%)	187 (78.9%)	0.617
Caucasian	326 (79.3%)	109 (46.0%)	<0.0001
Ischemic Cardiomyopathy	216 (52.6%)	139 (58.7%)	0.133
Bridge to Transplant (BTT)	240 (58.4%)	49 (20.7%)	<0.0001
Device Type	-	-	<0.0001
HM2	291 (70.8%)	219 (92.4%)	-
HVAD	44 (10.7%)	12 (5.1%)	-
HM3	76 (18.5%)	6 (2.5%)	-
INTERMACS	-	-	<0.0001
1	38 (9.2%)	53 (22.4%)	-
2-3	185 (45.1%)	144 (60.7%)	-
4-7	188 (45.7%)	40 (16.9%)	-
Diabetes Mellitus	147 (35.8%)	123 (51.9%)	<0.0001
Body Mass Index (BMI)	28.7 +/- 6.0	28.6 +/- 6.0	0.836
Creatinine	1.3 +/- 0.5	1.4 +/- 0.8	0.812
Albumin	3.4 +/- 0.6	3.3 +/- 0.7	0.042
Total Bilirubin	1.3 +/- 2.4	1.4 +/- 1.2	0.825
Right Atrial Pressure	12 +/- 6	14 +/- 7	0.0002
ACE-Inhibitor/ARB	287 (67.5%)	138 (32.5%)	0.003

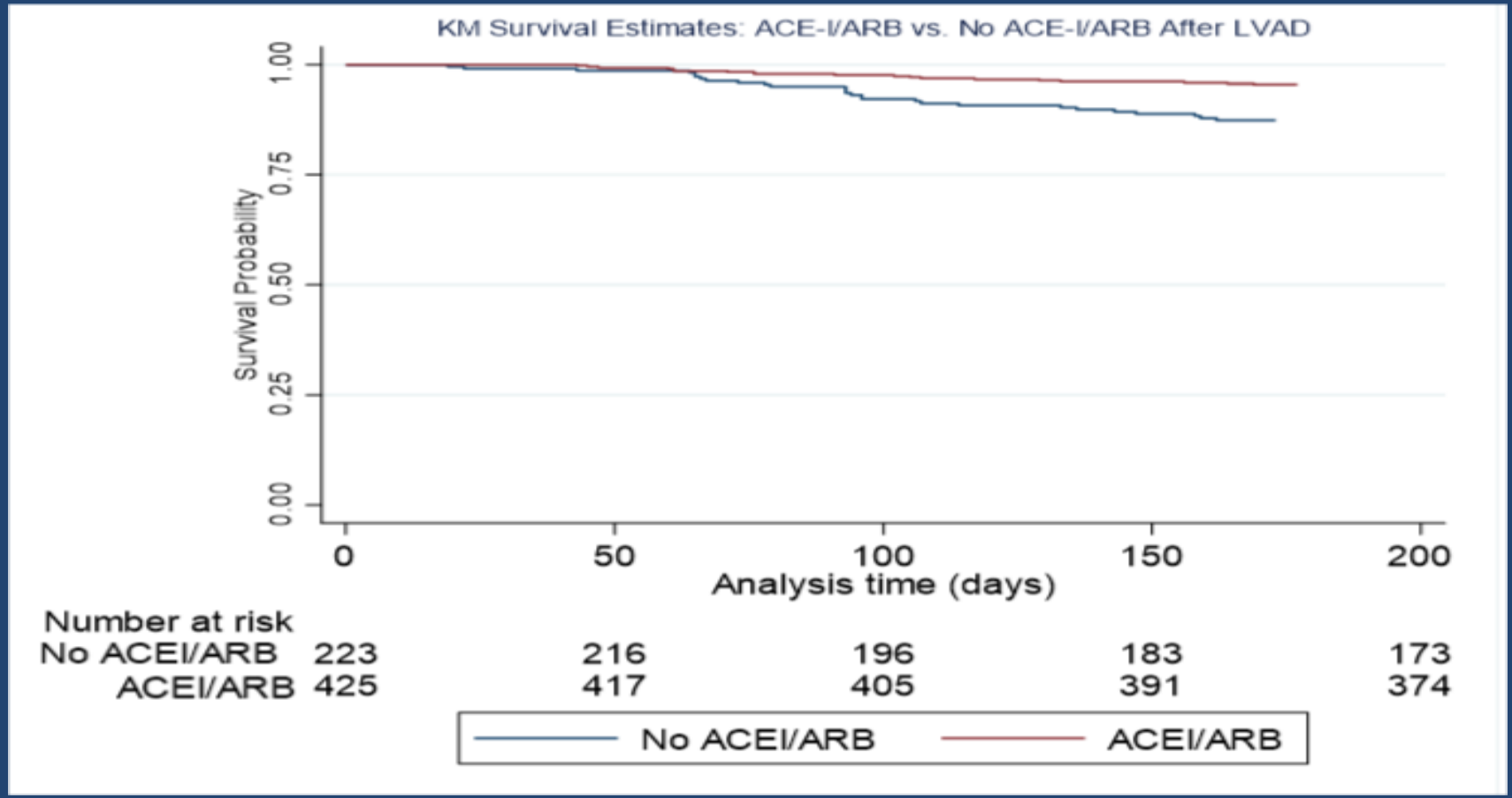
M HEALTH
University of Minnesota Medical Center

HOUSTON Methodist LEADING MEDICINE

Breakdown by ACE-I/ARB or Not

Variables	No ACE-I/ARB (n=223)	ACE-I/ARB (n=425)	p-value
Age	59 +/- 12	57 +/- 14	0.0242
Male	185 (83.0%)	333 (78.4%)	0.164
Caucasian	139 (62.3%)	296 (70.0%)	0.060
Ischemic Cardiomyopathy	132 (59.2%)	223 (52.5%)	0.102
Bridge to Transplant (BTT)	92 (41.3%)	197 (46.4%)	0.215
Device Type	-	-	0.119
HM2	182 (81.6%)	328 (77.2%)	-
HVAD	21 (9.4%)	35 (8.2%)	-
HM3	20 (9.0%)	62 (14.6%)	-
INTERMACS	-	-	0.137
1	33 (14.8%)	58 (13.7%)	-
2-3	123 (55.2%)	206 (48.5%)	-
4-7	67 (30.0%)	161 (37.9%)	-
Diabetes Mellitus	104 (46.6%)	166 (39.1%)	0.063
Body Mass Index (BMI)	28.8 +/- 6.0	28.5 +/- 6.0	0.5995
Creatinine	1.5 +/- 0.6	1.3 +/- 0.6	0.0001
Albumin	3.4 +/- 0.7	3.4 +/- 0.6	0.948
Total Bilirubin	1.5 +/- 3.2	1.3 +/- 1.2	0.3617
Right Atrial Pressure	13 +/- 7	13 +/- 6	0.4854

HEALTH
University of Minnesota Medical Center
HOUSTON Methodist LEADING MEDICINE



HEALTH
University of Minnesota Medical Center

HOUSTON Methodist
LEADING MEDICINE

Results

- Median length of follow up 608 days
- 66% (428/648) of patients were on an ACEI or ARB in the first 3 months after LVAD
- Use of either an ACEI or ARB was associated with an adjusted 35% reduction in the hazard rate of mortality on LVAD support
  - Adjusted hazard rate 0.65, 95% CI 0.48-0.87, p = 0.004
  - The final model was adjusted for sex, INTERMACS profile, BTT status, serum creatinine at the time of implant, serum albumin, and BMI

M HEALTH University of Minnesota Medical Center

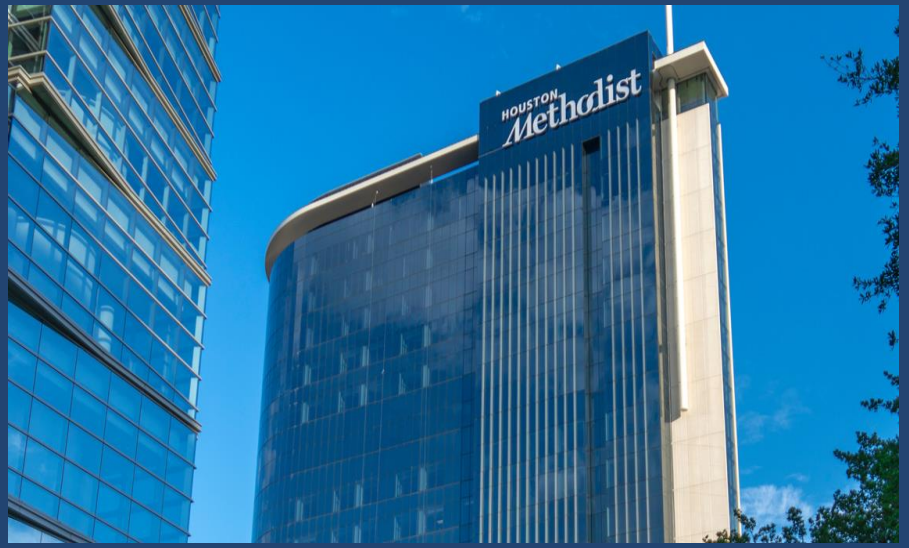
HOUSTON Methodist LEADING MEDICINE

Conclusion

- ACEI/ARB use associated with reduced post LVAD mortality in this large, multicenter, contemporary CF dataset inclusive of HeartMate 3 devices
- We did not look at use of pre-LVAD ACEI/ARB use to see if post-LVAD use was consistent
- Whether or not tolerating an ACEI or ARB is a marker of a healthier LVAD patient or is the direct cause of improved outcomes remains to be proven
- Prospective data required

M HEALTH University of Minnesota Medical Center
HOUSTON Methodist LEADING MEDICINE

Thank You



Special thanks to our Entire LVAD Team!

HEALTH
University of Minnesota
Medical Center

HOUSTON
Methodist
LEADING MEDICINE