

Poor Social Support Confers Worse Outcome After MCS

Henry Ford Transplant Institute

Kelly L. Bryce, PhD, Imad A. Hariri, MD, Allen Nemeh, Ginger St. John, MSW, Jennifer A. Cowger, MD, MS.

Disclosures

- K. Bryce: None.
- I. Hariri: None.
- A. Nemeh: None.
- G. St. John: None.
- J.A. Cowger: Consultant; Current/Ongoing -Abbott, Medtronic, Procrition, Endotronix. Grant/Research Support; Current/Ongoing - Abbott, Medtronic, Prycrion, Endotronix. Other Advisory Board Member; Current/Ongoing -Procyrion, Endotrox.

Introduction

- Learning more about which factors may impact outcome after mechanical circulatory support (MCS) therapy may improve patient selection and allow for interventions to mitigate risk.
- Psychosocial factors have been found to be associated with outcomes following heart transplant.
 - Pre-operative **depression** has been associated with worse survival after heart transplant (Zipfel et al., 2002; Havik et al., 2006 and Owen et al., 2007).
 - **Poor adherence** can negatively impact outcome in heart transplant, importance of identifying psychosocial risk factors (Dew et al., 1999).



Introduction

- Heart transplant has a significant psychosocial impact (see Conway et al., 2013 for full review)
 - Some good: gratitude and pride
 - Some bad: fear, depression, guilt, grief
 - Most significant finding: **THE IMPORTANCE OF SOCIAL SUPPORT**
 - Psychological well being
 - But also, contributing factor to long term health, post transplant
- **Social support** has been found to impact outcome in other medical settings as well.



Introduction

- However, research exploring the impact of psychosocial factors on MCS outcomes is limited:
 - Lundgren et al., 2018: “Psychosocial determinants do not appear to have a significant effect on mortality, but can result in increased risk of readmission”
 - Snipelisky et al., 2015: “Psychosocial characteristics are not significant predictors of death but are associated with readmission risk after DT LVAD.”
 - Review article, Bruce, et al., 2014: “Our results suggest that 3 psychosocial variables are possibly associated with VAD-related outcomes: depression, functional status, and self-care.”
- No known research investigating the impact of social support on outcomes following implantation of MCS.



Study Aims

- 1) To determine the which maladaptive psychology behaviors confer worse outcome after MCS.
- 2) To determine which social determinants and behaviors confer worse outcomes after MCS.
- 3) Equally important, to determine which psychosocial aberrations are not associated with adverse outcome during MCS.



Methods

- We completed a retrospective chart review of 87 consecutive patients who received a durable MCS at Henry Ford Hospital, Detroit MI and survived to discharge. All patients are seen for a psychological and social work evaluation.
 - **Psychosocial variables included:**
 - Psychological factors (history of psych diagnosis, history of psych hospitalization, compliance issues, self-report of adaptive coping strategies, substance abuse treatment history)
 - Social factors (marital/partner status, co-habitation status, years of education, history of learning disability, history of legal issues, history of incarceration, SW clearance)
 - Scores of medical literacy and numeracy, Insomnia Severity Index, Hospital Anxiety and Depression Scale, as well as MoCA Scores were also examined.



Statistics

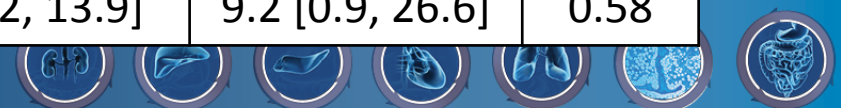
- Patients were grouped according to alive vs deceased during MCS for baseline comparisons
 - Continuous variables: presented as median [25, 75] and or mean +/- std deviation and compared with nonparametric vs parametric testing as appropriate.
 - Categorical variables: presented as n (%) and compared with Fisher's testing.
- Correlates of survival were evaluated using Cox regression models
 - Psychosocial variables were forced into models with forward selection ($p > 0.05$ for exist), adjusting for age, MCS type, and device intent.

Results

- Mean patient age was 57 ± 1.3 years.
- 37% were African American.
- Median [25th, 75th] support time of 9.5 [4.5,16] months.
- On univariable analysis, poor social support correlated (Fig 1a) with mortality, with non-significant trends towards those living alone and with non-compliance (Fig 1b) (table).
- On multivariable regression, poor social support had a marked influence on mortality, most notable after 6 months of support (Hazard Ratio= 0.08, $p=0.029$, Fig 1a).

Baseline Characteristics and Demographics

	Overall (n=88)	Alive (n=74)	Dead (n=14)	p
Age	55.3±11.1	54.6±10.6	57.9±13.7	0.41
Male	72 (81.8%)	62 (84%)	10 (71%)	0.23
Caucasian	56 (64%)	47 (64%)	9 (64%)	1.00
African American/Black	32 (36%)	27 (37%)	5 (36%)	
BMI kg/m ²	28.2±5.4	27.9±5.6	29.5±4.2	0.40
Ischemic heart failure	33 (38%)	25 (34%)	8 (57%)	0.40
BTT, listed	6 (6.8%)	4 (5.4%)	2 (2.3%)	0.24
DT	82 (93.2%)	70 (94.6%)	12 (85.7%)	
Intermacs Profile 1-2	57 (64.5%)	24 (33%)	6 (43%)	0.33
MCS type				0.000
HMII	7 (8.0%)	2 (2.7%)	5 (35.7%)	
HVAD	17 (19.3%)	13 (17.6%)	4 (28.6%)	
HM3	62 (71.6%)	59 (79.7%)	4 (28.6%)	
TAH	1 (1.1%)	0 (0%)	1 (7.1%)	
Time on support, months	9.2 [3.1, 15.4]	9.2 [3.2, 13.9]	9.2 [0.9, 26.6]	0.58



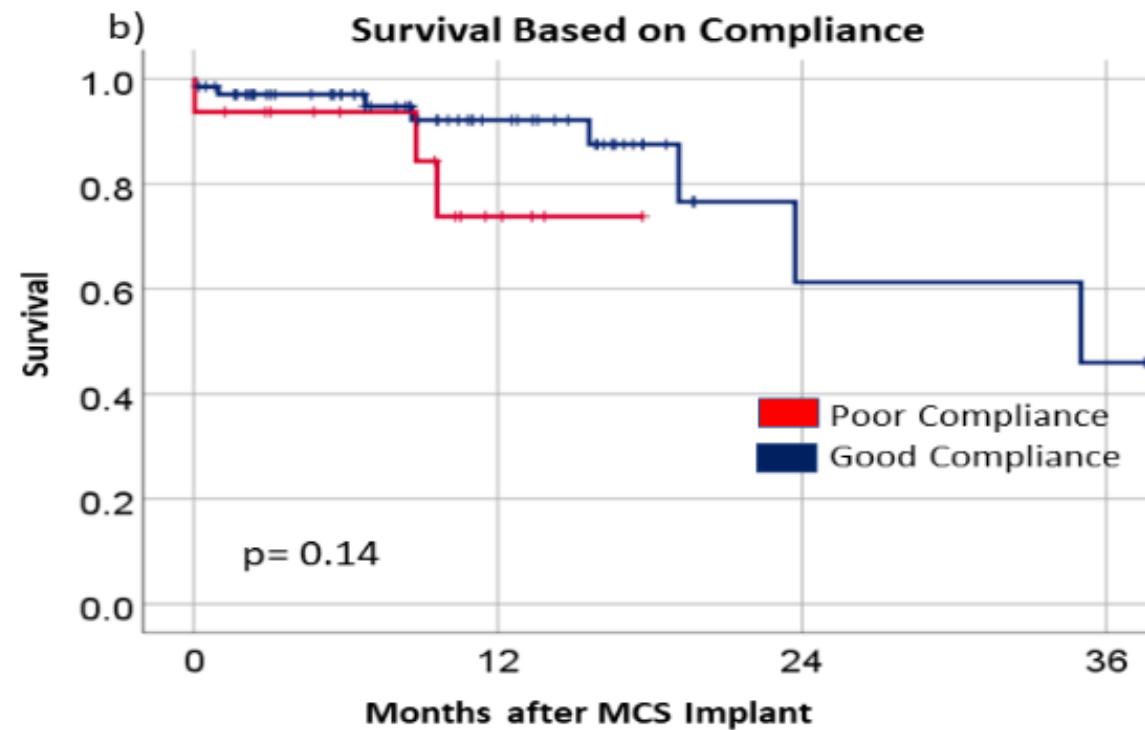
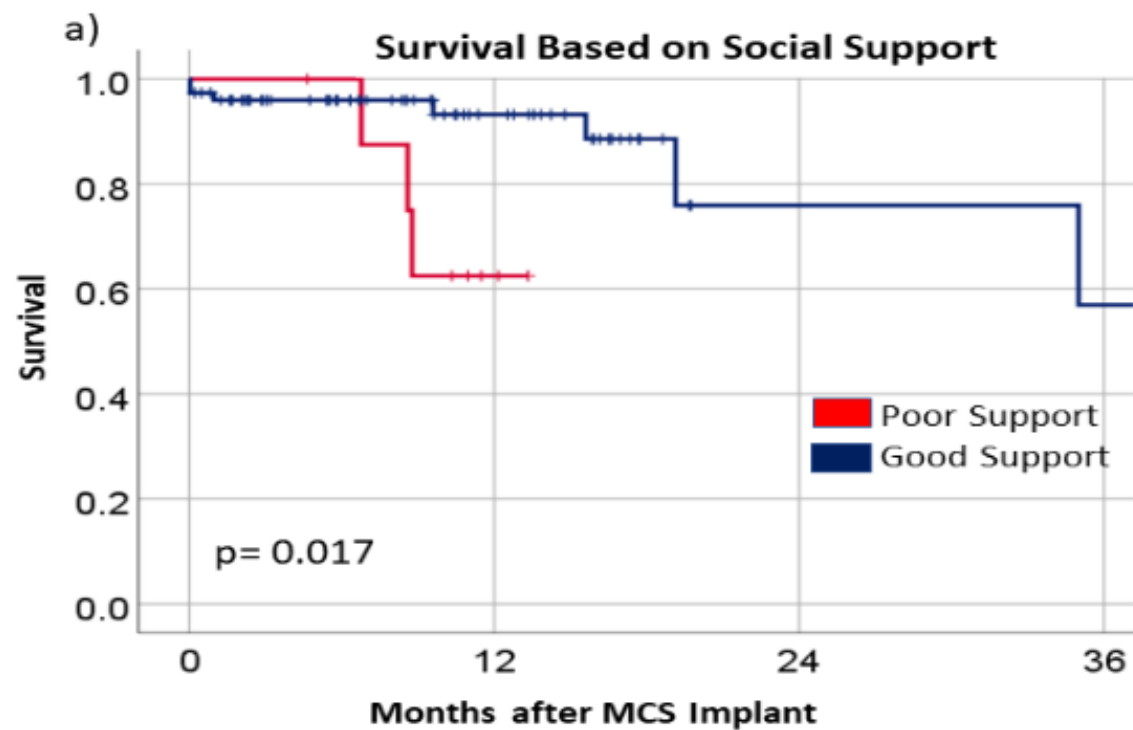
Preoperative Psychometric Measures

	Alive	Dead	p
HADs- Depression score	5.0 [2.0, 7.0]	6.0 [2.0, 7.0]	0.76
HADs- Anxiety	6.0 [3.0, 8.0]	6.0 [3.0, 8.0]	0.41
REALM-MR	7.5 [6.0, 8.0]	8.0 [5.0, 8.0]	0.50
REALM-SF	7.0 [6.0, 7.0]	7.0 [6.8, 7.0]	0.53
Numeracy	4.0 [3.0, 4.0]	4.0 [4.0, 4.0]	0.33
Insomnia Severity Index	9.00 [3.5, 15.8]	13 [6.0,16.5]	0.30
MOCA	23 [20.3, 26.10]	25 [24, 26.0]	0.007

Table: Psychosocial Variables Assessed prior to Mechanical Circulatory Support

	Alive (n=74)	Dead (n=13)	P value	Univariable Hazard Ratio for Mortality [95% CI]
Married/Partner	82%	18%	0.29	3.1 [0.39-24]
Not married/Partner	95%	5%		Reference
Noncompliant	81%	19%	0.17	2.82 [0.65-12]
Compliant	87%	13%		Reference
Live Alone	78%	22%	0.19	2.9 [0.58-14]
Lives with others	86%	14%		Reference
Learning Disabled	100%	0%	0.46	
Not Learn. Disabled	84%	16%		
Legal history	91%	9%	0.86	
No legal history	82%	19%		
Incarcerated	80%	20%	0.67	
Never Incarcerated	86%	14%		
Psychiatric history	84%	16%	0.73	
No history	86%	14%		
Good coping skills	84%	16%	0.34	
Poor coping skills	100%	0%		
Psych Hosp.	75%	25%	0.29	3.2 [0.38-26]
No Hosp.	85%	15%		Reference
Suicide Attempt	100%	0%	0.28	
No attempt	84%	16%		
Level of support Good	90%	10%	0.031	Ref
Level of support Poor	67%	33%		5.22 [1.1-23]

Figure 1:



Multivariable Analysis of Mortality Predictors

No psychosocial correlates studied were independently predictive aside from good social support.

	HR [95% CI]	p
Age	1.06 [0.99, 1.4]	0.10
DT Indication	29 [1.4 -100]	0.028
Device Type, HMII	2.6 [0.18-38]	0.21
Noncompliance	2.5 [0.34, 18]	0.37
Good social support	0.08 [0.071, 0.77]	0.029
Numeracy	2.0 [0.26, 16]	0.50
Insomnia	0.995 [0.88, 1.13]	0.94
REALM-R	0.995 [0.65, 1.5]	0.98

Limitations

- Exploratory analysis
- Observational data with limited power
- Data from a single center with demographics unique to Detroit and SE Michigan
- Lack of adjustment for multiple comparisons



Conclusions

- **Poor social support** was independently associated with worse outcome after MCS with a very high hazard for early mortality.
- Important trends were noted in univariable analysis to suggest risk in those **living alone** and/or with **poor compliance**.
- The presence of a dedicated support person/team to assist with the demands of MCS maintenance and close outpatient coordinator clinic and telephone follow-up may help improve outcomes.



Conclusions

- Additional research is needed.
- Identifying patients with a limited support network can allow for:
 - Interventions to aid patient in mobilizing support network.
 - Interventions aimed at education for supports to optimize their ability to help the patient.
- Dedicated research needed toward addressing health care disparities in MCS and heart failure, in general.



References

- Bruce, C.R., Delgado, E., Kostick, K., Grogan, S., Ashrith, G., Trachtenber, B., Estep, J.D., Bhimaraj, A., Pham, L., & Blumental-Barby, J.S. (2014). Ventricular assist devices: A review of psychosocial risk factors and their impact on outcomes. *Journal of Cardiac Failure* 20(12), 996-1003.
- Conway, A., Schadewaldt, V., Clark, R., Ski, C., Thompson, D.R., Doering, L. (2013) The psychological experiences of adult heart transplant recipients: a systematic review and metasummary of qualitative findings. *Heart Lung*, 42, 449–455.
- Dew, M.A., Kormos, R.L., Roth, L.H., Murali, S., DiMartini, A., Griffith, B.P. (1999). Early post-transplant medical compliance and mental health predict physical morbidity and mortality one to three years after heart transplantation. *Journal of Heart Lung Transplant*, 18, 549–562.
- Havik, O.E., Sivertsen, B., Relbo, A., Hellesvik, M., Grov, I., Geiran, O., et al. (2007). Depressive symptoms and all-cause mortality after heart transplantation. *Transplantation*, 84, 97–103.
- Lundgren, S., Lowes, B.D., Zolty, R., Burdorf, A., Raichlin, E., Um, J.Y., & Poon, C. (2018). Do psychosocial factors any impact on outcomes after left ventricular assist device implantation? *ASAIO Journal* 64(4), e43-e47.



References

- Owen, J.E., Bonds, C.L., Wellisch, D.K. (2006). Psychiatric evaluations of heart transplant candidates: predicting post-transplant hospitalizations, rejection episodes, and survival. *Psychosomatics*, 47, 213–222.
- Snipelisky, D., Stulak, J.M., Scheytte, S.D., Shashank, S., Kushwaha, S.S, & Dunlay, S.M. (2015). Psychosocial characteristics and outcomes in patients with left ventricular assist device implanted as destination therapy. *American Heart Journal*, 170(5), 887-894.
- Zipfel, S., Schneider, A., Wild, B., Lowe, B., Junger, J., Haass, M. et al. (2002). Effect of depressive symptoms on survival after heart transplantation. *Psychosomatic Medicine*, 64, 740–747.

