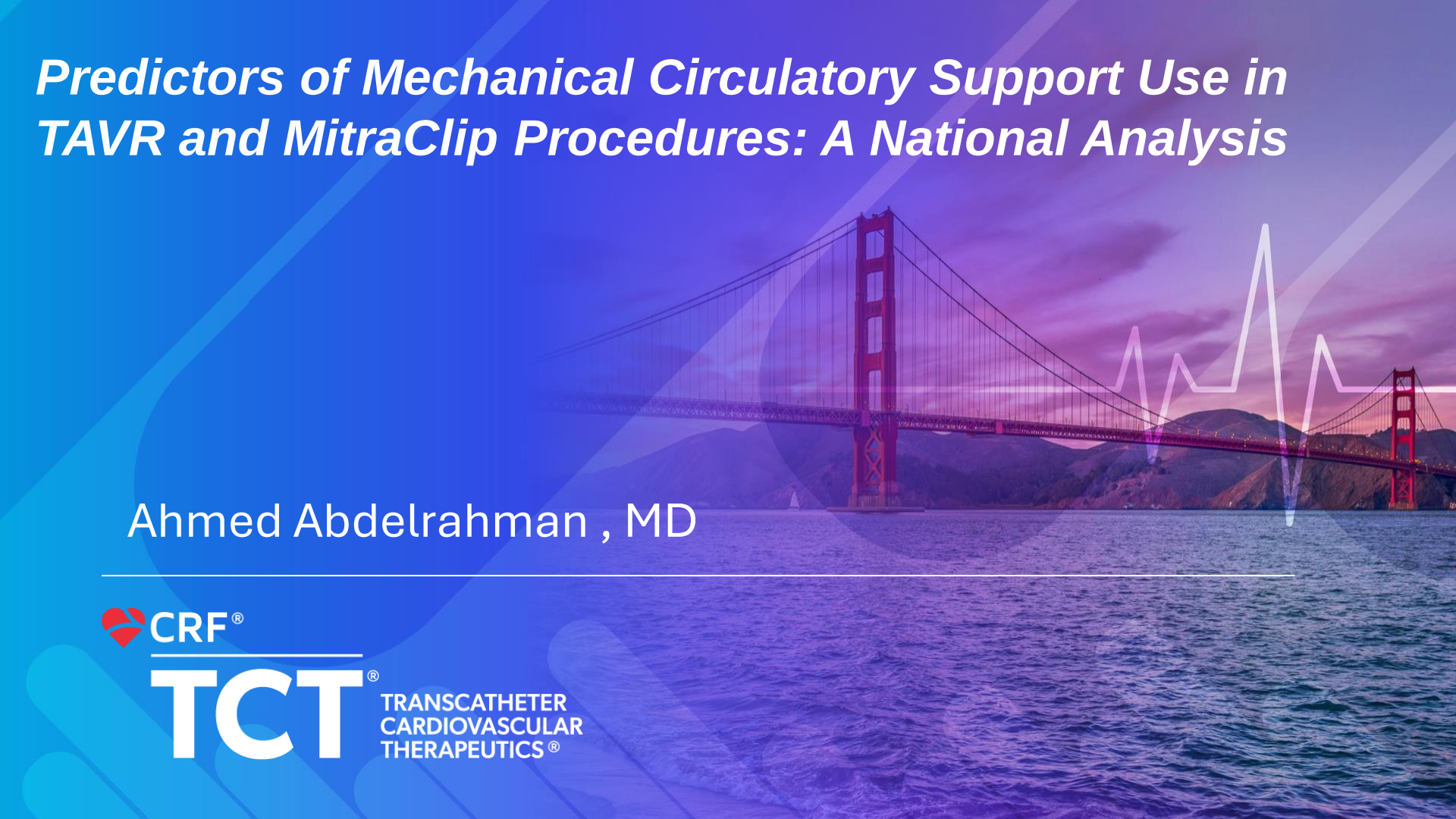
Predictors of Mechanical Circulatory Support Use in TAVR and MitraClip Procedures: A National Analysis



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Disclosure of Relevant Financial Relationships

I, Ahmed Abdelrahman, DO NOT have any financial relationships to disclose.

Background

Understanding predictors of Mechanical Circulatory Support (MCS) utilization during transcatheter valve interventions may guide peri-procedural planning and risk mitigation strategies.

Methods

Patients undergoing TAVR or MitraClip procedures between 2018–2021 were stratified by MCS use. Multivariable logistic regression models were constructed to identify independent predictors of MCS use.

Results

Among 330,055 transcatheter valve interventions (TAVR: 289,000; MitraClip: 41,055), MCS was used in 0.98% of cases (n=3,240). Independent predictors of MCS use included cardiogenic shock (aOR 64.89; 95% CI 53.32–78.98), congestive heart failure (aOR 7.27), teaching hospital status (aOR 3.85), anemia (aOR 1.51), protein-energy malnutrition (aOR 1.55), and chronic kidney disease (aOR 1.22).

Results

In TAVR specifically, age ≥65 (aOR 3.00), CHF (aOR 5.01), and history of PCI (aOR 1.97) were prominent predictors.

In Mitral Clip, CHF (aOR 32.09), malnutrition (aOR 1.97), and CKD (aOR 1.44) remained significant. Notably, Black and Hispanic races were associated with lower MCS use across both interventions.

Predictors of Mechanical Circulatory Support use:

Variable	Adjusted Odds Ratio	95% Confidence Interval	P-value
Age	2.26	1.81 – 2.83	<0.001
Race (Ref: White)			
Black	0.53	0.40 – 0.71	<0.001
Hispanic	0.67	0.47 – 0.96	0.030
Other	0.98	0.74 – 1.29	0.867
Female	0.90	0.77 – 1.06	0.227
Teaching hospital	3.85	2.65 – 5.60	<0.001
Anemia	1.51	1.27 – 1.80	<0.001
Protein-energy malnutrition	1.55	1.23 – 1.94	<0.001
Alcohol use	1.04	0.66 – 1.64	0.871
Insurance (Ref: Medicare)			
Medicaid	0.96	0.65 – 1.42	0.844
Private	1.10	0.85 – 1.41	0.482
Self-pay/Other	1.38	0.80 – 2.39	0.249
Obesity	1.06	0.86 – 1.30	0.603
CHF	7.27	5.36 – 9.86	<0.001
Arrhythmia	1.08	0.90 – 1.30	0.423
CKD	1.22	1.03 – 1.44	0.022
Pulmonary hypertension	1.56	0.21 – 11.38	0.661
History of PCI	2.06	1.29 – 3.28	0.003
CAD	1.77	1.45 – 2.16	<0.001
Cardiogenic shock	64.89	53.32 – 78.98	<0.001

Conclusion

Advanced comorbidities, hemodynamic compromise, and hospital-level factors predict MCS use during transcatheter valve procedures. These models may assist in pre-procedural risk stratification and resource allocation.

Questions

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