Management of Patients with Diabetes and Heart Failure with Reduced Ejection Fraction: A Cross-Country Comparison

Suzanne V. Arnold, Jonathan Yap, Carolyn S.P. Lam, Fengming Tang, Wan T. Tay, Tiew H.K. Teng, Darren K. McGuire, Abhinav Goyal, James L. Januzzi, Gregg C. Fonarow, Frederick A. Masoudi, Mikhail Kosiborod

Saint Luke's Mid America Heart Institute and University of Missouri-Kansas City, Kansas City, MO, USA; Duke-National University of Singapore and National Heart Centre, Singapore; University of Texas Southwestern Medical Center, Dallas, TX, USA; Emory University School of Medicine, Atlanta, GA, USA; Massachusetts General Hospital, Boston, MA, USA; University of California, Los Angeles, Los Angeles, CA, USA; University of Colorado, Denver, CO, USA

BACKGROUND

- While both heart failure (HF) and diabetes are each individually reaching epidemic proportions, the intersection between the two diagnoses has created substantial complexity in the management of these patients.

- These patients often require complex medication regimens, and the recommended management of one disease may complicate the other.

- We used two large registries from the US and Asia to compare the clinical characteristics and management of patients with diabetes and HF with reduced ejection fraction (HFrEF).

METHODS

- Data Sources:
  - DCR (Diabetes Collaborative Registry): US EHR-based outpatient registry of adults with diabetes seen in primary care, cardiology, and endocrinology practices (2013-2016)
  - ASIAN-HF (Asian Sudden Cardiac Death in Heart Failure): multi-national Asian registry of adults with HF (2010-2016)

- Patient Cohort:
  - Diabetes and HFrEF (EF <40%)

- As Asian countries represent a broad spectrum of economic development and healthcare infrastructure, countries were categorized into high (Asia-HI) vs. low income (Asia-LI), per United Nations classification.

- Compared using ANOVA and chi-square

TABLE 1: Patient Characteristics

	US n=51,992	Asia-HI n=1,075	Asia-LI n=1,160
Age (y)	70.0 (11.8)	63.2 (11.5)	59.8 (10.2)
Male sex	70%	79%	78%
Hypertension	86%	73%	63%
BMI (kg/m^2)	30.8 (7.2)	25.6 (5.0)	25.5 (4.9)
CAD	82%	63%	65%
Atrial fibrillation	44%	24%	8.3%
Tobacco use	61%	54%	39%
LV EF (%)	27.6 (7.3)	27.0 (7.4)	28.1 (6.6)
NYHA class			
Class I	23%	17%	10%
Class II	46%	54%	48%
Class III/IV	31%	29%	42%
Type I diabetes	5.1%	2.0%	3.1%
Diet-controlled diabetes	38%	26%	40%

TABLE 2: Treatment of HF and Diabetes

	US n=51,992	Asia-HI n=1,075	Asia-LI n=1,160
Heart Failure Treatment			
ACE-I/ARB	64%	76%	69%
Beta-blocker	77%	86%	69%
ICD only	11%	7.5%	2.3%
CRT/CRT-D	38%	7.7%	5.9%
Diabetes Treatment (T2D patients on ≥1 med)			
Insulin	45%	24%	25%
Metformin	52%	51%	57%
Sulfonylurea	40%	52%	54%
Thiazolidinedione	5.4%	0.3%	0.6%
DPP-4 inhibitor	16%	21%	13%
GLP-1 RA	4.0%	0.4%	0.0%
SGLT2 inhibitor	2.4%	0.3%	0.0%

CONCLUSIONS

- Significant differences exist between US and Asia in the clinical characteristics and treatment of patients with DM and coexisting HFrEF.
- Practice patterns are not optimal in either area, with opportunities for improvement in the use of evidence-based therapies for both conditions.
- Effective tools to guide medication choices for these complex and high-risk patients could have substantial impact on quality and outcomes.

DISCLOSURES