MDP875

COSTS AND HEALTHCARE RESOURCE UTILIZATION IN TRANSTHYRETIN AMYLOID CARDIOMYOPATHY EXCEEDS THAT OF NON-AMYLOID HEART FAILURE

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Presented on November 17 at the AHA Scientific Sessions 2024
McCormick Place Convention Center, Chicago, IL, USA

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DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS WITH INDUSTRY AND ACKNOWLEDGMENTS

Sandesh Dev has participated in advisory boards (uncompensated) for Pfizer and BridgeBio Pharma, Inc., has received grants from Pfizer, and has no consultancy fees to disclose.

Justin Grodin is a researcher for Texas Health Resources Clinical Scholarship, BridgeBio Pharma, Inc., Pfizer, and NHLBI R01HL160892, and a consultant, advisor, and speaker for Pfizer, BridgeBio Pharma, Inc., AstraZeneca, Intellia, Tenax Therapeutics, and Alexion.

Ahmad Masri is a researcher for Pfizer, Ionis, Attralus, and Cytokinetics, and a consultant, advisor, and speaker for Cytokinetics, BMS, BridgeBio Pharma, Inc., Pfizer, Ionis, Lexicon, Attralus, Alnylam, Haya, Alexion, Akros, Prothena, BioMarin, AstraZeneca, and Tenaya.

Richard Wright is a consultant, advisor, and speaker for Alnylam, Amgen, AstraZeneca, BMS, Boehringer Ingelheim, BridgeBio Pharma, Inc., Cytokinetics, Lexicon, Lilly, Myocardia, and Novartis.

Jean-François Tamby, **Heather Falvey**, and **Liana Hennum** are employees and stockholders of BridgeBio Pharma, Inc.

Chaitanya Badwe, **Melissa Allison**, **Rakesh Ramesh**, and **Shradha Sanghi** are employees of Definitive Healthcare.

Jose Nativi Nicolau has received research funding from Pfizer, Eidos, Alnylam, and AstraZeneca.

Acknowledgments

- This study was sponsored by BridgeBio Pharma, Inc., San Francisco, CA, USA.
- Under the direction of the authors, medical writing assistance was provided by Oxford PharmaGenesis Inc., and supported by BridgeBio Pharma, Inc. Editorial support and critical review were provided by Dana Walters, PhD, and Shweta Rane, PhD, CMPP of BridgeBio Pharma, Inc.

INTRODUCTION

- ATTR-CM is a progressive, fatal condition characterized by worsening HF, exercise intolerance, cardiac arrhythmias, aortic stenosis, and extracardiac manifestations[1-5]
- Although the prevalence of ATTR-CM is not well characterized due to high rates of misdiagnosis and delayed diagnosis,[1,4,6] it has been estimated that up to 150,000 people in the US have HF caused by ATTR-CM[3]
- The prognosis for patients with ATTR-CM is poor, with many studies reporting a median survival time of approximately 3-5 years, depending on the disease type and stage at the time of diagnosis[3-7]
- Previous analyses of patients in Europe and Asia have shown that ATTR-CM is associated with a substantial burden to healthcare systems[6-8]; however, there are limited data available to understand HCRU for patients with ATTR-CM in the US
- Additionally, it is important to understand how the burden of disease among patients with ATTR-CM compares to those with non-amyloid HF

OBJECTIVE:

To compare all-cause and CV-related HCRU and costs between patients with ATTR-CM and patients with non-amyloid HF in the US using real-world medical and pharmacy claims data

ATTR-CM, transthyretin amyloid cardiomyopathy; CV, cardiovascular; HCRU, healthcare resource utilization; HF, heart failure; US, United States.

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METHODS

Data source: Optum® Clinformatics® Data Mart database (Jan 2016–Sept 2023)

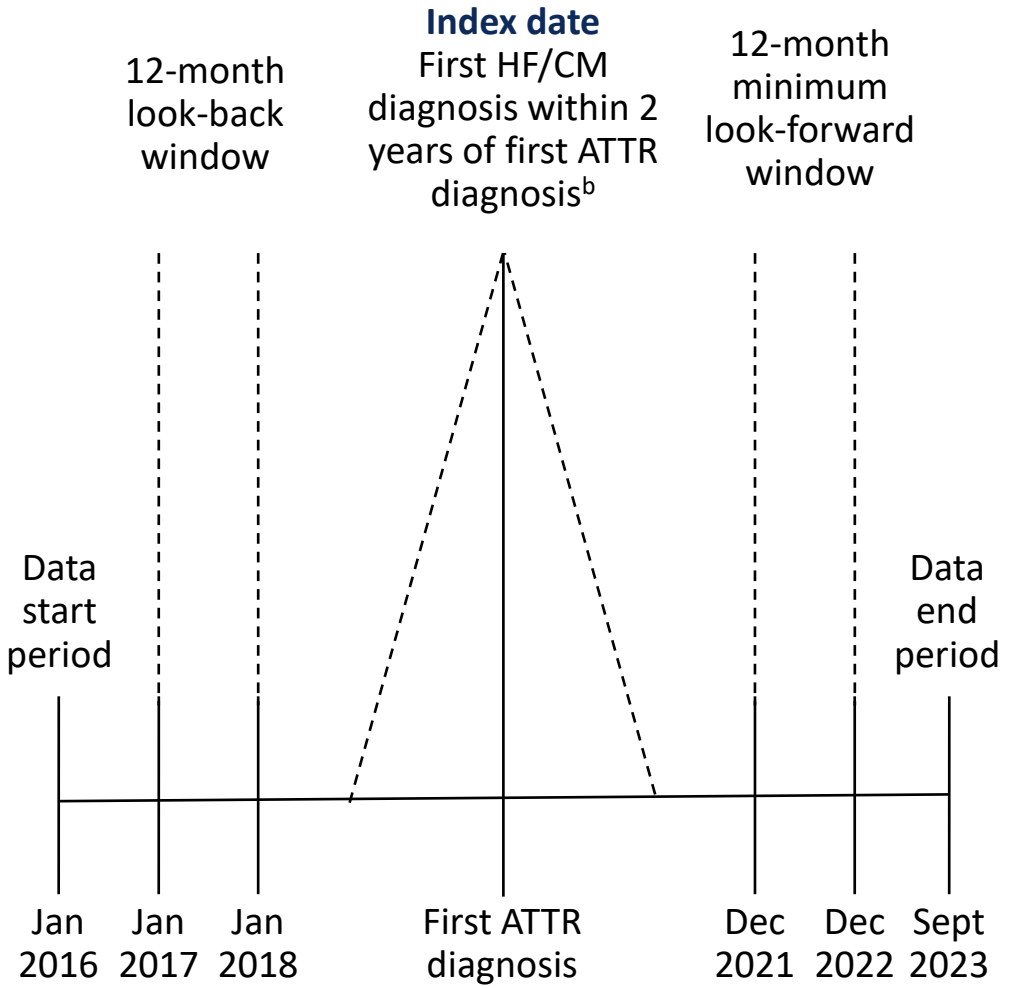
Inclusion criteria:

- Diagnosis of ATTR[a] on any claim (Jan 2017–Dec 2022)
- Diagnosis of HF and/or CM[a] within 2 years of first ATTR diagnosis
- Minimum 2 years of continuous enrollment (with minimum 3-month look-back and 12-month look-forward from index[b])
- Excluded if diagnosed with AL amyloidosis or MM, or received chemotherapy or heart, liver, or kidney transplant (2016–2022)

Comparison group: Non-amyloid HF cohort (diagnosis of HF[a] with no evidence of ATTR)

Outcomes: Baseline demographics, procedures of interest, all-cause and CV-related hospitalizations[c] and LOS, and hospitalization-related inpatient costs (2024 USD)

Statistical analysis: Patients with ATTR-CM were matched using 1:1 PSM[d] to patients with non-amyloid HF. Hospitalizations/costs were compared using 2-tailed t tests and Mann-Whitney U tests



[a]Based on ICD-10-CM codes. [b]First HF/CM diagnosis after first ATTR diagnosis or last HF/CM diagnosis before first ATTR diagnosis if no post-ATTR HF/CM diagnosis. [c]CV-related hospitalizations were defined as inpatient admissions during which the patient received a CV diagnosis. [d]PSM methods included 1:1 nearest neighbor matching with a caliper width of 0.2 SD of the logit scores, and was based on the following covariates: age, race, US state, sex, and index diagnosis year.

AL, light chain; ATTR-CM, transthyretin amyloid cardiomyopathy; CM, cardiomyopathy; CV, cardiovascular; HF, heart failure; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; LOS, length of stay; MM, multiple myeloma; PSM, propensity score matching; SD, standard deviation; USD, United States dollars.

BASELINE DEMOGRAPHICS AND PROCEDURES OF INTEREST

Baseline demographics

- 4,966 patients with ATTR-CM and 861,507 patients with non-amyloid HF were identified
- Each matched cohort included 4,571 patients with well-balanced baseline demographics

Characteristic	ATTR-CM (N = 4,571)	Non-amyloid HF (N = 4,571)
Age, years, mean (SD)	75.3 (9.1)	75.5 (8.8)
Sex, male, n (%)	2,570 (56.2)	2,562 (56.0)
Race, n (%)		
Asian	88 (1.9)	93 (2.0)
Black	1,023 (22.4)	729 (15.9)
White	2,949 (64.5)	3,306 (72.3)
Unknown/None[a]	511 (11.2)	443 (9.7)
Ethnicity, n (%)		
Hispanic	365 (8.0)	408 (8.9)
Non-Hispanic	2,243 (49.1)	2,162 (47.3)
Unknown/None[a]	1,963 (42.9)	2,001 (43.8)
Follow-up time, years, mean (SD)	2.9 (1.1)	3.0 (1.2)

Procedures of interest (1-year look-forward from index)

- The most common procedures in both cohorts included cardiac catheterization and coronary angiography, IV diuretics, endoscopy, and colonoscopy

Body system	Procedures, n (% of total cohort)	ATTR-CM (N = 4,571)	Non-amyloid HF (N = 4,571)
N/A	**Any procedure of interest**	**2,412 (52.8)**	**2,077 (45.4)**
CV	Cardioversion	287 (6.3)	166 (3.6)
	Pacemaker + ICD implantation	274 (6.0)	216 (4.7)
	Cardiac catheterization + coronary angiography	1,092 (23.9)	819 (17.9)
	Cardiac catheter ablation	131 (2.9)	78 (1.7)
	IV diuretics	493 (10.8)	372 (8.1)
	Cardiac biopsy	92 (2.0)	0 (0.0)
Digestive	Colonoscopy	392 (8.6)	414 (9.1)
	Upper gastrointestinal endoscopy – EGD	482 (10.5)	473 (10.3)
	Biopsy of liver	16 (0.4)	9 (0.2)
	Abdominal paracentesis	33 (0.7)	24 (0.5)
Eye	Cataract surgery	196 (4.3)	191 (4.2)
Hemic and lymphatic	Bone marrow biopsy	18 (0.4)	11 (0.2)
Musculo-skeletal	Carpal tunnel release	60 (1.3)	22 (0.5)
	Trigger finger/biceps tendons	188 (4.1)	128 (2.8)
	Achilles tendon	2 (0.0)	1 (0.0)
	Laminectomy	35 (0.8)	28 (0.6)
Nervous	Nerve conduction studies + electromyography	240 (5.3)	159 (3.5)

[a]Unknown and none are separate categories but have been combined for presentation.

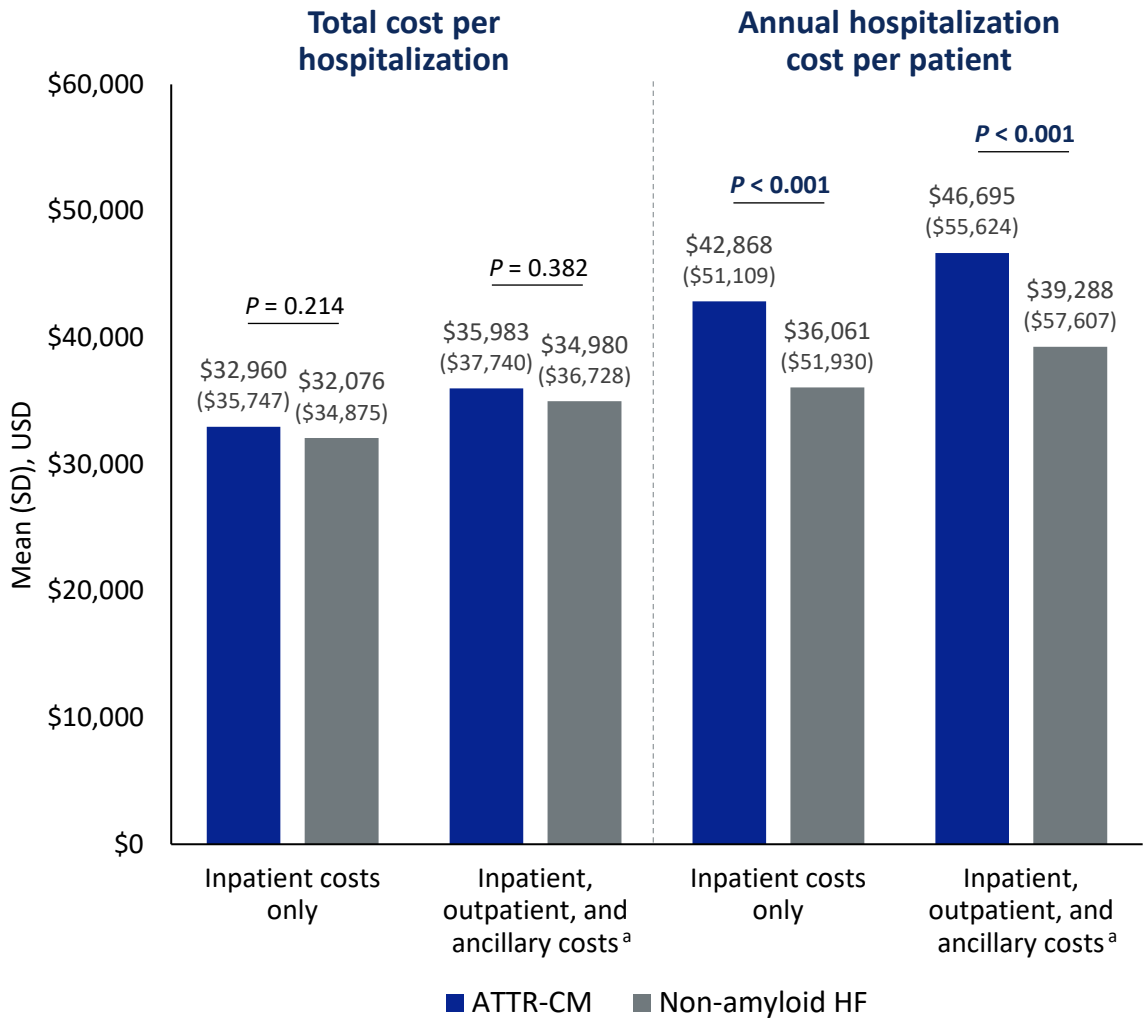
ATTR-CM, transthyretin amyloid cardiomyopathy; CV, cardiovascular; EGD, esophagogastroduodenoscopy; HF, heart failure; ICD, implantable cardioverter-defibrillator; IV, intravenous; SD, standard deviation.

ALL-CAUSE HOSPITALIZATIONS AND ASSOCIATED COSTS

Compared with the non-amyloid HF cohort, the ATTR-CM cohort had:

- more hospitalizations
- longer LOS per hospitalization
- more days hospitalized annually per patient
- higher annual hospitalization costs per patient

	ATTR-CM (N = 4,571)	Non-amyloid HF (N = 4,571)	*P*-value
Patients with a hospitalization, n (%)	3,451 (75.5)	3,001 (65.7)	0.433
Total hospitalizations, n	11,255	8,150	**< 0.001**
Total hospitalizations per patient (95% CI)	3.3 (3.1, 3.4)	2.7 (2.6, 2.9)	**< 0.001**
LOS per hospitalization, days Mean (SD) Median (95% CI)	 8.0 (11.7) 6.0 (5.7, 6.3)	 7.5 (7.2) 5.0 (4.8, 5.3)	**< 0.001**
Days hospitalized annually per patient Mean (SD) Median (95% CI)	 10.6 (15.8) 5.9 (5.6, 6.2)	 8.4 (12.3) 4.5 (4.3, 4.7)	**< 0.001**



[a]Ancillary costs include those for durable medical equipment, drugs administered, home health/hospice visits, services/supplies, and transportation incurred during hospitalizations.
ATTR-CM, transthyretin amyloid cardiomyopathy; CI, confidence interval; HF, heart failure; LOS, length of stay; SD, standard deviation; USD, United States dollars.

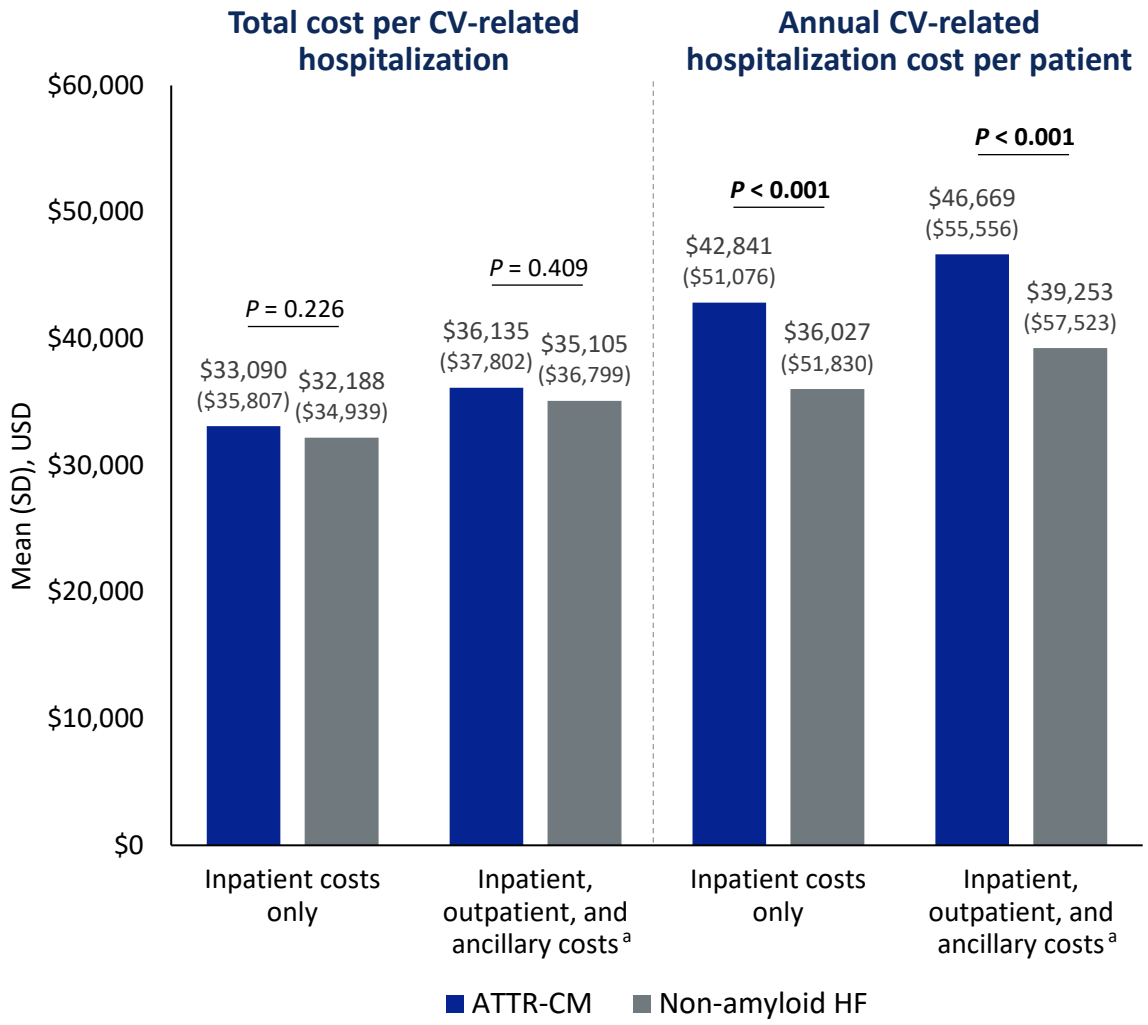
CV-RELATED HOSPITALIZATIONS AND ASSOCIATED COSTS

Compared with the non-amyloid HF cohort, the ATTR-CM cohort had:

- more CV-related hospitalizations
- longer LOS per CV-related hospitalization
- more CV-related days hospitalized annually per patient
- higher annual CV-related hospitalization costs per patient

Commercial patients had higher mean total costs per CV-related hospitalization than Medicare patients in both cohorts (ATTR-CM cohort: $47,645 vs $35,975, *P* < 0.001)

	ATTR-CM (N = 4,571)	Non-amyloid HF (N = 4,571)	*P*-value
Patients with a hospitalization, n (%)	3,440 (75.3)	2,991 (65.4)	0.347
Total hospitalizations, n	11,170	8,085	**< 0.001**
Total hospitalizations per patient (95% CI)	3.3 (3.1, 3.4)	2.7 (2.6, 2.8)	**< 0.001**
LOS per hospitalization, days Mean (SD) Median (95% CI)	 8.0 (11.7) 6.0 (5.7, 6.3)	 7.5 (7.2) 6.0 (5.7, 6.3)	**<0.001**
Days hospitalized annually per patient Mean (SD) Median (95% CI)	 10.5 (15.6) 5.9 (5.6, 6.2)	 8.3 (12.1) 4.5 (4.3, 4.8)	**< 0.001**



[a]Ancillary costs include those for durable medical equipment, drugs administered, home health/hospice visits, services/supplies, and transportation incurred during hospitalizations.
ATTR-CM, transthyretin amyloid cardiomyopathy; CI, confidence interval; CV, cardiovascular; HF, heart failure; LOS, length of stay; SD, standard deviation; USD, United States dollars.

CONCLUSIONS

The results of this study suggest that ATTR-CM is associated with an equal or greater per-patient burden on the US healthcare system than non-amyloid HF in terms of hospitalizations and associated costs, with the vast majority (>99%) of hospitalizations being CV related in both groups

Although the management of ATTR-CM has improved with the introduction of the first disease-modifying therapy in 2019,[1,2] the present findings indicate that patients with ATTR-CM have a higher burden of disease and resource utilization than patients with non-amyloid HF that may be addressed by implementing novel disease-specific management strategies

Further research is also warranted to determine whether timely diagnosis and early treatment with current and emerging therapies reduces disease burden and resource utilization due to ATTR-CM at the health system level

ATTR-CM, transthyretin amyloid cardiomyopathy; CV, cardiovascular; HCRU, healthcare resource utilization; HF, heart failure; LOS, length of stay; US, United States.

1. Fine NM. JACC Case Rep. 2020;2(13):2128-2130. 2. Tschope C, Elsanhoury A. J Clin Med. 2022;11(8):2148.