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BACKGROUND

- Angiotensin converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs) are the most common treatments for heart failure with reduced ejection fraction (HFrEF).¹
- On July 7, 2015, the Food and Drug Administration (FDA) approved sacubitril/valsartan to reduce the risk of cardiovascular death and hospitalization in heart failure (HF) patients with chronic HFrEF (New York Heart Association [NYHA] Class II to IV).²
- Previous analyses demonstrated that treatment with sacubitril/valsartan had lower hospitalizations and costs than ACEIs and ARBs. However, the real-world data on the economic impact of sacubitril/valsartan is limited, especially in the Medicaid population.³⁻⁷

OBJECTIVES

To compare the cost of HF-related hospitalizations and emergency department (ED) visits to the treatment cost of managing HF pre- and post-sacubitril/valsartan initiation in a state Medicaid population with HF.

METHODS



This retrospective analysis included pharmacy claims, medical claims, and prior authorization (PA) data from July 7, 2014 to August 31, 2019 for Massachusetts Medicaid (MassHealth) Fee-For-Service/Primary Care Clinician/Primary Care Accountable Care Organization members with continuous coverage one year pre- and post-initiation of sacubitril/valsartan (i.e., index date).

— The pre-index period was defined as the one-year period prior to initiating sacubitril/valsartan, while the post-index period was defined as the one-year period post-sacubitril/valsartan initiation.

The variability of costs were measured using a sensitivity analysis.

Inclusion Criteria:

- Members \geq 18 years of age with an approved PA request for sacubitril/valsartan between July 7, 2015 and August 31, 2018.
- Members with ≥ 2 pharmacy claims for sacubitril/valsartan during the post-index period.

Exclusion Criteria:

Members with third-party liability (TPL) or 340B claims.

- Members without continuous coverage, defined as no coverage for \geq 45 days throughout the pre- or post-index periods.

Primary Outcomes:

— Benefit-cost ratio, defined as the ratio of the mean difference in the cost (i.e., cost avoided) of HF-related hospitalizations and ED visits to the mean difference in the cost of HF-pharmacotherapies between pre- and post-index periods.

- HF-related hospitalizations and ED visits were defined as medicals claims with a diagnosis of chronic HF based on ICD-9 or ICD-10 codes in the first three billing positions.
- Net benefit, defined as the mean difference between the cost of avoided HF-related hospitalizations and ED visits and the mean difference in the cost of HF-pharmacotherapies between pre- and post-index periods.

Secondary Outcomes:

- Benefit-cost ratio and net benefit in members adherent to sacubitril/valsartan (defined as proportion of days covered [PDC] \geq 80% during the post-index period).
- Number of HF-related hospitalizations during the pre- and post-index periods based on medical claims.
- Total amount paid for medical and pharmacy claims related to HF during the pre- and post-index periods.

DISCLOSURES

The authors have no financial disclosures

Cost-Benefit Analysis of Sacubitril/Valsartan Among Patients with Heart Failure with Reduced Ejection Fraction in a Medicaid Population

RESULTS

Figure 1. Study Population **Population Assessed for Eligibility** Members enrolled in a FFS/PCC/ACO-B plan with an approved PA for sacubitril/valsartan between 7/7/2015 and 8/31/2018 N=185 Members without TPL or 340B claims N=125 Members with ≥ 2 paid claims for sacubitril/valsartan during 1-year post-index period N=92 **Study Population** Members with continuous coverage during 1-year pre/post-index time frame N=22 Sub-analysis: Members adherent to sacubitril/valsartan N=12

Table 1. Clinical and Demographic Variables*

Characteristics	Ν		
Study Population	22		
Members adherent to sacubitril/valsartan (%)	12 (55%)		
Gender (# female)	<11		
Mean age, in Years (range)	50.3 (22.0-73.0)		
HF-Pharmacotherapies	Pre-index (N)	Post-index (N)	
Beta-blockers	20	20	
Loop Diuretics	18	19	
Potassium-Sparing Agents	18	16	
ACEIs	17	<11	
ARBs	<11	<11	
Thiazide Diuretics	<11	<11	
Ivabradine	<11	<11	
Digoxin	<11	<11	
Isosorbide Dinitrate	<11	<11	
Hydralazine	<11	<11	





Table 2. Cost-Benefit Analysis*

	Number of HF-Related Hospitalizations and ED Visits	Mean Cost Avoided in Hospitalizations and ED Visits per Member	Mean Difference in Cost of HF- Pharmacotherapies per Member	Net Benefit per Member	Benefit- Cost Ratio
Study Population (N=22)	Pre-Index: 26	\$3,603	\$3,939	(\$336)	0.91
	Post-Index: 23				
PDC ≥80% for sacubitril/ valsartan (N=12)	Pre-Index: 12	\$7,734	\$5,397	\$2,337	1.43
	Post-Index: 10				

*Analysis was based on members in the study population

*Cell sizes <11 were not reportable Abbreviations: ACEI=angiotensin converting enzyme inhibitor, ARB=angiotensin receptor blocker Figure 2. Amount Paid for Heart Failure-Associated Hospitalizations/ED visits and Pharmacotherapies for All Members (N=22)

Figure 3. Amount Paid for Heart Failure-Associated Hospitalizations/ED visits and Pharmacotherapies for Members Adherent to Sacubitril/Valsartan (N=12)



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DISCUSSION

- In the overall study population, the negative net benefit and the benefit-cost ratio being <1.0</p> demonstrated that the cost of HF-pharmacotherapies was greater than the cost of avoided HF-related hospitalizations and ED visits (Table 2).
- Sacubitril/valsartan accounted for 89% of pharmacy spend during the post-index period. Overall, 64% of members had a hospitalization/ED visit in either the pre- or post-index period. Fewer hospitalizations/ED visits were observed in the post-index period compared to the pre-index period (23 vs 26).
- The mean differences in the costs of avoided HF-related hospitalizations/ED visits and HF-pharmacotherapies were less than the incremental differences seen in previous analyses that compared sacubitril/valsartan to ACEIs or ARBs only.³⁻⁷
- The median cost of avoided HF-related hospitalizations/ED visits during the pre- and postindex periods was \$21,301 and \$12,552, respectively. The ranges of the sensitivity analyses for the cost avoidance for HF-related hospitalizations/ED and HF-pharmacotherapies were (\$30,874) to \$46,343 and \$3,526 to \$7,269, respectively, for the overall study population. The wide range for the cost avoidance for HF-related hospitalizations/ED visits demonstrated high variability in costs between members.
- Among members adherent to sacubitril/valsartan (i.e., PDC \geq 80%), the cost of HF-pharmacotherapies was less than the cost of hospitalizations/ED visits (Table 2).

LIMITATIONS

- Retrospective-claims analyses carry the risk of inaccurate or incomplete data. For example, medical claims with HF-related ICD-9 or ICD-10 codes in the first three billing positions were included. As a result, hospitalizations or ED visits not related to HF may have been included.
- Unclear if changes in other HF-pharmacotherapies or the length of the study affected the results. There was no comparator group of similar members that did not switch to sacubitril/valsartan.
- Members with TPL and 340B claims were excluded in order to have a population with a complete set of claims data. Of the members with an approved PA for sacubitril/valsartan, only 12% met the inclusion criteria, limiting the applicability of the results.

CONCLUSIONS

- This analysis suggests that while there was a decrease in the number and cost of HFrelated hospitalizations/ED visits after members initiated sacubitril/valsartan, the increased cost of HF-pharmacotherapies after initiating sacubitril/valsartan was greater than the cost of hospitalizations/ED visits.
- The overall benefit (cost avoidance in hospitalizations/ED visits) did not outweigh the additional costs of sacubitril/valsartan. However, members that are more adherent to sacubitril/valsartan did have an overall benefit that outweighs the additional cost of sacubitril/valsartan.

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