Adherence to Medications for the Treatment of Congestive Heart Failure and Its Association with Health Care Expenditures

Ann Bagchi
Dominick Esposito
Myoung Kim
James Verdier
Deo Bencio

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Background
- Congestive heart failure (CHF) affects 2.6% of all Medicaid beneficiaries and 10.7% of dual eligibles
- Medication adherence plays a key role in managing CHF
- CHF is a target for disease management and medication therapy management programs
- Few studies have examined CHF drug use within the Medicaid population

Research Objectives
- Determine the proportion of Medicaid beneficiaries with CHF drug fills
- Estimate CHF medication adherence rates among beneficiaries with at least one fill
- Examine association of CHF drug adherence with utilization and total health care costs

Data
- 1998 State Medicaid Research Files (SMRF) – Used to identify beneficiaries with a CHF diagnosis
- 1999 Medicaid Analytic eXtract (MAX) files – Provided information on diagnoses, drug use, and Medicaid-covered services and expenditures
- 1999 Medicare Standard Analytic File (SAF) – Provided information on Medicare-covered services and expenditures

Inclusion/Exclusion Criteria
- 45,572 beneficiaries in four states: AR, CA, IN, and NJ
- Continuously enrolled in Medicaid fee-for-service 1998-1999 or until death
- Diagnosed with CHF in either:
  - One inpatient stay
  - Two or more ambulatory care visits
- Excludes beneficiaries with any nursing home stays

Outcome Measures
- CHF drug fills
  - Receipt of any CHF prescriptions
  - Adherence levels
- Health care costs (Medicare and Medicaid)
  - Total (excluding and including drug costs), prescription drug, inpatient, outpatient, and other medical services
- Health care utilization
  - Inpatient hospitalizations
  - Emergency department

Examine association of CHF drug adherence
Estimate CHF medication adherence rates
Determine the proportion of Medicaid beneficiaries
among beneficiaries with at least one CHF drug fill

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Levels of Health Care Utilization in the Year

Medication Possession Ratio (MPR)
- Ratio of total days supply to number of days between index prescription and last prescription date

Medication persistence
- Number of days of continuous drug use per month

Findings on CHF Drug Fills
- 85% of patients had at least one CHF drug claim
- Those with at least one prescription filled, on average, 1.4 prescriptions per month
- Likelihood of filling a prescription was lower for:
  - Individuals aged 64 and younger
  - African Americans
  - Males
  - Individuals with health comorbidities

Findings on CHF Drug Adherence
- Median adherence values were higher than the means, indicating outliers with significantly lower adherence
  - MPR: median = 82.8% and mean = 71.9%
    - Persistence: median = 28.6 days and mean = 24.8 days
- Adherence rates were lower for:
  - Individuals aged 64 and younger
  - African Americans
  - Males
  - Individuals with health comorbidities

Non-Adherent Patients Had Higher Levels of Health Care Utilization in the Year

<table>
<thead>
<tr>
<th>Utilization Measures</th>
<th>Non-Adherent</th>
<th>Adherent</th>
<th>Difference (* p &lt; 0.01)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Hospitalization</td>
<td>47.9%</td>
<td>47.5%</td>
<td>0.4*</td>
</tr>
<tr>
<td>Number of Hospitalizations</td>
<td>1.6</td>
<td>1.4</td>
<td>0.2*</td>
</tr>
<tr>
<td>Number of Inpatient Days</td>
<td>8.0</td>
<td>5.9</td>
<td>2.1*</td>
</tr>
<tr>
<td>Any ER Visit</td>
<td>43.1%</td>
<td>43.7%</td>
<td>1.4*</td>
</tr>
<tr>
<td>Number of ER Visits</td>
<td>4.0</td>
<td>3.6</td>
<td>0.4*</td>
</tr>
</tbody>
</table>

Non-Adherent Patients Had Higher Health Care Costs in the Year

<table>
<thead>
<tr>
<th>Cost Measures</th>
<th>Non-Adherent</th>
<th>Adherent</th>
<th>Difference (* p &lt; 0.01)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: Including Drugs</td>
<td>$25,312</td>
<td>$19,462</td>
<td>$5,850*</td>
</tr>
<tr>
<td>Total: Excluding Drugs</td>
<td>$23,101</td>
<td>$16,338</td>
<td>$6,763*</td>
</tr>
<tr>
<td>Drugs</td>
<td>$2,322</td>
<td>$3,516</td>
<td>-$1,194*</td>
</tr>
<tr>
<td>Inpatient</td>
<td>$10,686</td>
<td>$7,809</td>
<td>$2,877*</td>
</tr>
<tr>
<td>Outpatient</td>
<td>$9,267</td>
<td>$7,766</td>
<td>$1,501*</td>
</tr>
<tr>
<td>Other</td>
<td>$1,347</td>
<td>$1,313</td>
<td>$34</td>
</tr>
</tbody>
</table>
Health Care Costs Have a Graded Association with Drug Adherence

<table>
<thead>
<tr>
<th>Adherence Level</th>
<th>Total Costs</th>
<th>Total Costs (excluding drugs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>99% or more (comparison group)</td>
<td>$16,989</td>
<td>$13,691</td>
</tr>
<tr>
<td>95% to 99%</td>
<td>$18,141*</td>
<td>$14,733*</td>
</tr>
<tr>
<td>80% to 95%</td>
<td>$23,730*</td>
<td>$17,675*</td>
</tr>
<tr>
<td>50% to 80%</td>
<td>$24,350*</td>
<td>$21,768*</td>
</tr>
<tr>
<td>Less than 50%</td>
<td>$36,486*</td>
<td>$24,349*</td>
</tr>
</tbody>
</table>

* Predicted costs are significantly larger than the predicted costs of the group with adherence of 99% or more at p < .001 using a two-tailed test.

Conclusions and Policy Implications

- The association of adherence to health care utilization was small but significant.
- CHF drug adherence is associated with lower health care costs among Medicaid beneficiaries.
- Even small changes in the level of adherence could significantly affect health care spending.
- State Medicaid agencies and Medicare prescription drug plans should consider developing targeted interventions to improve adherence with CHF drugs.