Determinants of Diabetes Control in Veterans with Serious Mental Illness

Robert Okwemba, BSPHS, Pharm.D. 2015
Philadelphia College of Pharmacy

Judith Long, MD,RWJCS
Perelman School of Medicine
Philadelphia Veteran Affairs Medical Center
Agenda

• Background
• Objective
• Overview
• Methods
• Results
• Conclusion
• Lesson learned
• Acknowledgment
## Background

<table>
<thead>
<tr>
<th></th>
<th>Nationally</th>
<th>VA</th>
<th>SMI patients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevalence of Diabetes</strong></td>
<td>2006-07 7.8% of population (23.6 million people)</td>
<td>2000 19.6%</td>
<td>16-25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-3X higher</td>
</tr>
</tbody>
</table>

- Nationally, $174 Billion, 60% of this geared to hospitalization & medical care treatment supplies

- VA, 24% of outpatient pharmacy budget is in medication supplies

- Mortality: In U.S. is the 7th cause of death

---

Diabetes & Associated Morbidities

• Diabetes Mellitus (DM) is a chronic disease manifested by high blood sugar (glucose) levels

• Glucose control is a vital determinant of microvascular diseases including\(^1\):
  ✓ Blindness
  ✓ Renal failure
  ✓ Amputations

Annals of Internal Medicine. 1997 127(9):788-95\(^1\)
Serious Mental Illness (SMI)

- SMI Includes schizophrenia and bipolar disorder.

- In 2002/2003, an estimated 1.2 million male veterans were identified as living with serious mental illness.

National Alliance on Mental Illness, Veterans Resource Center
Diabetic Care Development

Pre-Insulins
• Prognosis + mortality 100%¹

Post antidiabetics
• Non-adherence = $270 billion burden²
• Solution: programs targeting specific diseases like multiple sclerosis, cardiovascular diseases
• Problem: gap in psych programs

Insulin
• Healthy dieting & exercising
• Powerful antidiabetics

http://diabetes.niddk.nih.gov/dm/pubs/overview/¹
Kim Ribbink. The Real Remedy: Medication Adherence. Ignite. Dec 2011²
Objective

• To determine if adherence to SMI medications is associated with adherence to diabetes medications in patients with SMI and diabetes
Adherence

• Adherence is the extent to which patients acts in accordance with prescribed interval & dose of a dosing regimen (ISPOR definition).

• Adherence can be determined though Medication Possession Ratio (MPR)

• A good MPR is set as $\geq 80\%$
Is MPR a Reliable Tool?

A study was conducted between 2000-2001 to examine if non-adherence to oral antidiabetic drugs measured through MPR was associated with hospitalization rate.

<table>
<thead>
<tr>
<th>2000 adherence scores MPR %</th>
<th>MPR</th>
<th>99-80</th>
<th>79-60</th>
<th>59-40</th>
<th>&lt;40</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPR</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>220</td>
<td>421</td>
<td>165</td>
<td>67</td>
<td>27</td>
</tr>
<tr>
<td>2001 hospitalization rate</td>
<td>4.1</td>
<td>5.2</td>
<td>10.3</td>
<td>11.9</td>
<td>14.8</td>
</tr>
</tbody>
</table>

Lau Dt., Nau DP. Oral antihyperglycemic medication nonadherence and subsequent hospitalization among individuals with type 2 DM. DM Care 2004;27:2149-2153
Predictors of Poor Medication Adherence

- Psychological problems
- Cognitive impairment
- Complexity of treatment
- Patient’s lack of belief in benefit of treatment
- Patient’s lack of insight into the illness

Glucose Control in VA Patients with Diabetes and Serious Mental Illness

Study: Diabetes treatment among VA patients with comorbid serious Mental Illness

<table>
<thead>
<tr>
<th>Design:</th>
<th>Measures:</th>
<th>Findings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 36,546 Observational Patients with and without SMI receiving diabetic care</td>
<td>DM quality of care &amp; outcome measures were compared for DM+ SMI &amp; age matched patients with DM minus SMI</td>
<td>DM+SMI patients were as likely as patients with DM only to have comparable HbA1c, LDL &amp; cholesterol values</td>
</tr>
</tbody>
</table>

Conclusion: Little or no difference in glucose control among Vets with & without SMI

Krein SL Psychiatr Serv. 2006;57(7): 1016-21
Methodology

Study Design
- Retrospective cohort study: 2008-2011
- Multi-Center: 3 VA location Pittsburgh, Philadelphia, Bedford MA

Sample
- 319 veterans based on pharmacy benefit management database
- Inclusions: Patients >21yrs of age with Diabetes & SMI (Bipolar & Schizophrenia); have taken DM meds within 2 years of enrollment

Data
- Survey: multiple choice questionnaire
- SAS statistical package was used for analysis
## Results

### Table 1. Medication Demographics for Enrolled Patients

<table>
<thead>
<tr>
<th>SMI Diagnosis</th>
<th>Bipolar N</th>
<th>Bipolar Percent</th>
<th>Schizophrenia N</th>
<th>Schizophrenia Percent</th>
<th>% N</th>
<th>% Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any psychiatric medication</td>
<td>107</td>
<td>34%</td>
<td>212</td>
<td>66%</td>
<td>319</td>
<td>100.0%</td>
</tr>
<tr>
<td>Antipsychotic drugs</td>
<td>35</td>
<td>57%</td>
<td>26</td>
<td>43%</td>
<td>61</td>
<td>20%</td>
</tr>
<tr>
<td>Yes</td>
<td>71</td>
<td>28%</td>
<td>187</td>
<td>72%</td>
<td>258</td>
<td>80%</td>
</tr>
<tr>
<td>Mood stabilizing drugs</td>
<td>21</td>
<td>16%</td>
<td>109</td>
<td>84%</td>
<td>129</td>
<td>39%</td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>45%</td>
<td>104</td>
<td>55%</td>
<td>190</td>
<td>41%</td>
</tr>
<tr>
<td>Mood stabilizing and antipsychotic drugs</td>
<td>56</td>
<td>29%</td>
<td>134</td>
<td>71%</td>
<td>190</td>
<td>60%</td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>40%</td>
<td>78</td>
<td>60%</td>
<td>129</td>
<td>40%</td>
</tr>
</tbody>
</table>
# MPR for DM Medications and MPR for all Psychiatric Medications

Table 2. MPR Level for SMI Medications by MPR Level for DM Medications

<table>
<thead>
<tr>
<th>MPR_level_SMI</th>
<th>MPR_level_DM</th>
<th>Frequency</th>
<th>Percent</th>
<th>Row Pct</th>
<th>Col Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>good ( &gt; 80% )</td>
<td>poor ( &lt;= 80% )</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>good ( &gt; 80% )</td>
<td>125</td>
<td>48</td>
<td>173</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>73</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>poor ( &lt;= 80% )</td>
<td>74</td>
<td>72</td>
<td>146</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>119</td>
<td>319</td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>63</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chi-Square value 15.7, P<0.0001
No Correlation between MPR Rate for DM Medications and all Psychiatric Medications

Pearson correlation 0.2597, p=<0.0001
Conclusion

• No correlation between DM medication adherence with SMI medication adherence in patients with DM & SMI

• Programs that focus simply on improving SMI symptoms and medication adherence are unlikely to improve DM medication adherence

• To improve DM outcomes in patients with SMI we most likely need to develop DM specific programs that take into account the unique issues faced by patients with SMI
Lesson Learned

• Study design
• Interdisciplinary collaboration
• Statistical interpretation
• Scientific writing
Acknowledgment

• Judith Long, MD, PI & Mentor
• Steve Marcus, PhD, Co-investigator
• Andrew Wang, MPH, CPH- Projects Manager
• Elina Medvedeva, MS, Statistician
• Leonard Davis Institute of Health Economics