Metabolic Issues: What We Know, What We Do, What We Need
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WHAT WE KNOW

• Cardiovascular disease and obesity are major public health problems.
• People with SMI live up to 25 years less than the general population.
• Mortality rates for persons with SMI have shown a steady increase.
• Metabolic syndrome increases risk for developing serious medical outcomes.
• Complications from cardiovascular disease are among the leading causes of death for patients diagnosed with chronic schizophrenia

De Herr, Scheurs, Vancampfort, & Van Winkel, 2009

WHAT WE KNOW

FACTORS INCREASING RISK

• genetic predisposition to weight gain
• sedentary lifestyles
• poor nutrition
• smoking
• side effects of their medications
• second generation antipsychotics especially are associated with weight gain, glucose dysregulation, and diabetes

WHAT WE KNOW

ASSOCIATED WEIGHT GAIN WITH ANTIPSYCHOTICS

When compared to placebo:
  • Ziprasidone: -0.18 lbs/month
  • Haloperidol: -0.49 lbs/month
  • Risperidone: -0.55 lbs/month
  • Olanzapine: -1.5 lbs/month

(results similar to those in the CATIE Study)

Parsons et al., 2009

DISCLOSURES

No Conflict of Interest.
Some studies supported by Pollinator Grant Funding.

Table 1. Relative Effect of SGAs on Metabolic Disturbances

<table>
<thead>
<tr>
<th>Generic (Trade Name)</th>
<th>Weight Gain</th>
<th>Dyslipidemia</th>
<th>T2DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorpromazine (Zyprenex)</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Diazepam (Valium)</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Haloperidol (Haldol)</td>
<td>Moderate</td>
<td>Low to moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Ziprasidone (Geodon)</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Zipproctol (Zyprosen)</td>
<td>Moderate</td>
<td>Low to moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Olanzapine (Zyprep)</td>
<td>Low to moderate</td>
<td>Low</td>
<td>Unknown</td>
</tr>
<tr>
<td>Aripiprazole (Abilify)</td>
<td>Low</td>
<td>Low</td>
<td>Unknown</td>
</tr>
<tr>
<td>Risperidone (Risperdal)</td>
<td>Low to moderate</td>
<td>Low</td>
<td>Unknown</td>
</tr>
<tr>
<td>Paliperidone (Invega)</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Amisulpride (Seroquel)</td>
<td>Low to moderate</td>
<td>Low</td>
<td>Unknown</td>
</tr>
<tr>
<td>Clozapine (Clozaril)</td>
<td>Low to moderate</td>
<td>Low</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

1 Due to the limited real data for these agents, their metabolic effects profiles are based on the package insert.
With second generation antipsychotics, T2DM type 1 diabetes mellitus.
Source: References 1, 6.
WHAT WE KNOW

METABOLIC SYNDROME:
A group of multiple and interrelated conditions resulting from obesity, specifically abdominal obesity and insulin resistance.

ATP DEFINITION FOR METABOLIC SYNDROME
- Waist circumference > 40" male/35" female
- Triglyceride > 150 mg/DL
- Fasting Blood Glucose > 100 mg/DL
- HDL < 40 male/50 female
- Blood pressure > 130/85

Adult Treatment Panel III

WHAT WE KNOW ABOUT INCIDENCE

McLean Hospital Inpatient Review 2010-2011
- 589 consecutive patient records from the Psychotic Disorders Program reviewed.
- 23.7% prevalence of metabolic syndrome.
- Risk increases continuously (to 40%) after a decade or more of treatment and was correlated to weight gain.
- Risk is greater for those patients taking 2 or more antipsychotics or a mood stabilizer.

Centorrino et al. (2012)

WHAT WE KNOW ABOUT INCIDENCE

Nursing Metabolic Syndrome Study 2011
Sample of 73 men and 52 women, ages 18-64 admitted to an inpatient psychotic disorder unit:
GROUP A - 21 subjects (16.8%) had three or more risk factors
GROUP B - 26 subjects (20.8%) had at least two risk factors
Only 5 of the 47 (10.6%) patients in the study with two or more risk factors for metabolic syndrome were referred for primary care follow up after discharge.

SECOND GENERATION ANTIPSYCHOTIC MEDICATIONS
79.2% of total sample = one or more SGA’s at discharge

GROUP A
- Aripiprazole (Abilify) 27.7%
- Risperidone (Risperdal) 25.5%
- Clozapine (Clozaril) 19.1%
- Quetiapine (Seroquel) 17%
- Olanzapine (Zyprexa) 12.8%
- Ziprasidone (Geodon) 8%

GROUP B
- Risperidone (Risperdal) 26.9%
- Quetiapine (Seroquel) 21.8%
- Aripiprazole (Abilify) 20.5%
- Olanzapine (Zyprexa) 14.1%
- Ziprasidone (Geodon) 5.1%
- Clozapine (Clozaril) 3.9%
WHAT WE KNOW

Individuals with Mental Illness Have Lack of Access to Medical Care and have difficulty navigating all aspects of medical care.

Access Issues
- Insufficient diagnostic and preventative care
- Insufficient routine testing
- Insufficient cardiovascular procedures

Bradford et al., 2006; Gill et al. 2009

FACTOR CONTRIBUTING TO LACK OF ACCESS
- Compliance issues.
- Psychiatric symptoms that interfere with their ability to be involved in health activities.
- Money issues that prevent healthy food choices, memberships to gym, preventative care (co-pays, etc.).
- Competing health needs
- A fragmented system of care.
- Difficulty for medical provider to arrange psychiatric follow-up
- Difficulty for psychiatric provider to arrange medical follow up
- Reimbursement for services (especially mental health) spotty.

WHAT WE KNOW

LACK OF CONSENSUS CONTRIBUTES TO LACK OF CARE
Who should monitor & treat
- Psychiatrist should screen and refer?
- PCP’s should monitor and treat?
- Psychiatrist should monitor and assure treatment of medical conditions?
- What about APRN’s?

Poor physical health is a barrier to maximizing functional health.


WHAT WE KNOW

Factors Influencing where/who Delivers Medical Care
- Mental Health Providers
  - Is major issue psychiatric in nature?
  - Do people with medical co-morbidities fall through the cracks?
- Primary Care Providers
  - Is major issue medical in nature?
  - Do people with psychiatric issues fall through the cracks?

WHAT WE KNOW

Challenges for Behavioral Health
Lack of clinician awareness of need for health education.
  - MD’s - SW’s
  - RN’s - APRN’s
Patients lack knowledge about own health status and health risks.
Transition of care from all levels of care needs to be seamless (inpatient – partial hospitalization–outpatient)
  - Wellness education needed throughout

WHAT WE KNOW

Challenges for Primary Care
Lack of clinician knowledge of risks specific to mental illness.
Medical specialization issues.
Patients lack knowledge about need monitoring of health risks.
Cognitive and social support challenges.
Lack of ease for psychiatric referral/collaboration.
Transition of care issues.
WHAT WE KNOW ABOUT MONITORING

APA & ADA 2004 Guidelines for Monitoring Metabolic Risk

Baseline screening prior to medication prescription:

- BMI
- Waist circumference
- FBS
- Fasting Lipids

Ongoing Monitoring:

- BMI every 3 months
- Waist circumference annually
- FBS annually
- Fasting lipids every 5 years (or more frequently if clinically indicated).

ADA 2004

WHAT WE KNOW

Adherence issues. Psychiatric symptoms that interfere with their ability to be involved in health activities.

Money issues that prevent healthy food choices, memberships to gym, preventative care (co-pays, etc.).

Competing health needs. A fragmented system of care.

- Difficulty for medical provider to arrange psychiatric follow-up
- Difficulty for psychiatric provider to arrange medical follow-up

Reimbursement for services (especially mental health) spotty. (Mangurian, et al., 2013; Agency for Healthcare Research and Quality, ND)

WHAT WE KNOW ABOUT MEDS

- Second generation antipsychotic medications increase risk for weight gain (but so do other meds)
- Second generation antipsychotic medications affect insulin resistance and other metabolic processes
- The better the medication works, the more likely it is to cause metabolic side effects (good example is Clozaril)

We designed a study to see if interventions carried out by advanced practice nurses could affect Metabolic Syndrome risks in persons with serious mental illness

Designed to cross encounters – from inpatient to outpatient (time of increased risk)
WHAT WE KNOW

Intervention Study:
Inpatients attended 7 Healthy Living Groups on unit focused on AHA’s “Simple 7’s”
• Get Active
• Eat Better
• Loose Weight
• Stop Smoking
• Control Cholesterol
• Manage Blood Pressure
• Reduce Blood Glucose

WHAT WE KNOW

Pilot Study Design
Sample: Persons with Schizophrenia, Bipolar Disorder ages 18-55.
Developed, initiated and managed by nurses.
Included a 20 week post-discharge protocol.

WHAT WE KNOW

INITIAL SCREEN FOR:
• Presence of 2 risk factors for MS.
• Baseline waist circumference, vital signs and biological measures (FBS, triglycerides, HDL).
• QOL measure.
• Health Goal development.

WHAT WE KNOW

STUDY DESIGN:
Weekly in person (while hospitalized) or telephone contact (post discharge) with psychiatric nurse to coach on progress toward health goal.
• What are the benefits if you continue toward your goal
• What are the negatives if you stop working toward your goal
NP visits for Health Assessment post discharge week 2, 6, 10, 14 and 18.
• Physical Assessment
Psychiatric nurse visit immediately following for measurement of perceived progress toward health goal and coaching.
Evaluation of biological measures week 10 and 18 (FBS, triglycerides, HDL’s).

38 individuals enrolled
• 11 completed
• 2 lost to followed up at week 12
• 5 lost to follow up at weeks 6 -11.
• 5 followed up through the 1st appointment (2 weeks after discharge).
• 15 enrolled and never followed up post-discharge

All
• Gender: 23 Males, 15 Females
• Age: Range 21-55, M = 40.2
Completed Protocol
• Gender:
  • Age: M = 38.87; F = 42.8
WHAT WE KNOW

CASE STUDY:
23 year old with first psychotic break

Had gained 60 lbs while on risperdal before seeing APRN.

Did not recognize significance of weight gain…“I didn’t realize what this weight gain meant…”

Developed a plan for healthier eating and some moderate exercise.

CASE STUDY 2
54 year old married man, head of computer department in University

History of bipolar disorder, seen by NP/psych RN team following hospitalization for acute mania

Still very disorganized post–discharge
18 week follow up post-discharge

- Psychopharm issues - medical issues
- Lifestyle issue - work-related issues
CASE STUDY 3
35 yo patient with schizophrenia
Type 2 DM on insulin for few years
Homeless at times
Compliance with med/psych regimen waxes and wanes
Multiple issues including:
  - Diabetic teaching (in context of limited capacity)
  - Management of medications
  - Lifestyle interventions given limited resources

WHAT WE LEARNED
Access is limited (both directions)
Care of persons with SMI is complicated
Long term follow up is needed
Case management issues
  - psychiatric
  - medical

WHAT WE LEARNED
• Psychiatric nurse role
• Role of Advanced Practice Nurse
• Thorough assessment/Risk identification
• Integration of care (psychiatric and medical)
• Lifestyle modification programs
• May only maintain health status in many
• Change is difficult to sustain
• Interventions must be long term

WHAT AFFECTS INTEGRATION OF CARE
• Degree of knowledge
• Dissemination of information
• Change in traditional roles
• Practice setting culture
• Barriers to implementation:
  - Organizational hierarchy
  - Roles of multiple health care providers
  - Finances
  - Political influences
  - Administration support
  - Competence

WHAT WE KNOW
Overview:
Factors affecting integration may include degree of knowledge, dissemination of information, and practice setting culture.

Purpose:
  - Identify level of knowledge of PMHN’s,
  - Determine whether recommendations for monitoring occurred in practice and
  - Identify perceived knowledge gaps.

• IRB approval through the University of Massachusetts Lowell.
• Survey Design using a National Psychiatric Nurses Association online social media site with a link to Survey Monkey.
• Developed Knowledge Questionnaire related to metabolic syndrome.
• Adapted 15 items from the PHASE (Robson &Haddad, 2012) to reflect practice specifically related to metabolic syndrome.
• Six questions to identify perceived knowledge need.
**WHAT WE KNOW**

**Knowledge of Risk Factors for metabolic Syndrome**

(N=154)

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated blood pressure (≥135/80 mm Hg)</td>
<td>119 (77.3)</td>
</tr>
<tr>
<td>Increased waist circumference (female &gt;35 in, male &gt;40 in)</td>
<td>151 (98.1)</td>
</tr>
<tr>
<td>Elevated fasting blood sugar (&gt;100 mg/dl)</td>
<td>137 (89)</td>
</tr>
<tr>
<td>Low high-density lipoprotein (female &lt;50 mg/dl, male &lt;40 mg/dl)</td>
<td>105 (68.2)</td>
</tr>
<tr>
<td>Elevated triglycerides (&gt;150 mg/dl)</td>
<td>141 (91.6)</td>
</tr>
</tbody>
</table>

**Knowledge of Physiological Monitoring for Metabolic Syndrome**

(N=154)

<table>
<thead>
<tr>
<th>Medical Monitoring</th>
<th>N [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Mass Index</td>
<td>145 (94.2)</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>141 (91.6)</td>
</tr>
<tr>
<td>Waist Circumference</td>
<td>138 (89.6)</td>
</tr>
<tr>
<td>Blood Glucose</td>
<td>140 (90.9)</td>
</tr>
<tr>
<td>Lipid Panel (HDL and Triglyceride)</td>
<td>148 996.1</td>
</tr>
<tr>
<td>HgbA1C</td>
<td>136 (88.3)</td>
</tr>
</tbody>
</table>

**WHAT WE DO**

In order to improve my practice I would like more education on how to …………

1. Care for mental health clients with metabolic risk, metabolic syndrome and diabetes (82.9%)
2. Help clients manage their cardiovascular health (77.5%)
3. Help clients exercise safely and effectively (79.2%)
4. Help clients eat more healthy (82.2%)
5. Help clients stop smoking (81.3%)
6. Help clients manage their weight (83.5%)
WHAT WE DO

- More than 20% of nurse respondents did not regularly help clients manage their weight, measure waist circumference, weigh clients, help clients stop smoking, educate clients about MetS risks or share info about client’s risk for MetS with team.
- Nurses with advanced degrees were more likely to incorporate monitoring measures into practice.
- More studies are needed to identify factors other than knowledge that influence practice.
- Barriers in practice settings that impact using evidence in practice need to be studied.

Overview:
- There is a lag time in the application of knowledge within clinical settings.
- Psychiatric-mental health nurses are challenged to utilize EBP for clients with MetS in assessing, discussing and making recommendations about their health status.

Purpose:
- To investigate attitudes, confidence and barriers in providing physical health care for people with SMI; and if perceived ability to influence care regarding MetS in their practice setting was correlated with the performance of physical care.

WHAT WE DO

Overview:
- There is a lag time in the application of knowledge within clinical settings.
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Purpose:
- To investigate attitudes, confidence and barriers in providing physical health care for people with SMI; and if perceived ability to influence care regarding MetS in their practice setting was correlated with the performance of physical care.

WHAT WE DO

Method
- Survey Design using a National Psychiatric Nurses Association online social media site with a link to Survey Monkey.
- Adapted version of the Physical Health Attitude Scale (PHASE) (Robson & Haddad, 2012),
- An adapted version of the Menon Empowerment Scale (Menon, 2001)

Sample
- Sample described in the previous study.

Results – Correlation Table

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Confidence</th>
<th>Barriers</th>
<th>Practice Activities</th>
<th>Menon Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- .423**</td>
<td>.251**</td>
<td>.437**</td>
<td>.147</td>
</tr>
<tr>
<td>Confidence</td>
<td>- .262**</td>
<td>- .294**</td>
<td>.241**</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>- .380**</td>
<td>- .294**</td>
<td>.241**</td>
<td>.433**</td>
</tr>
<tr>
<td></td>
<td>- .44.2**</td>
<td>- .44.2**</td>
<td>- .44.2**</td>
<td>-</td>
</tr>
</tbody>
</table>

Results:
- Level of education did not impact attitude, confidence, lack of perceived barriers in providing physical care, practice activities or perceived empowerment
  - Diploma/AD/BS nurses = group 1 (n=45)
  - MS/DNP/PhD nurses = group 2 (n=110)

WHAT WE DO

Results:
- Multiple Linear Regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.875</td>
<td>.215</td>
<td>.406</td>
<td>.000</td>
<td>1.258</td>
</tr>
<tr>
<td>Confidence</td>
<td>.529</td>
<td>.264</td>
<td>.208</td>
<td>.046</td>
<td>1.296</td>
</tr>
<tr>
<td>Barriers</td>
<td>.377</td>
<td>.133</td>
<td>.330</td>
<td>.100</td>
<td>1.242</td>
</tr>
<tr>
<td>Menon Empowerment</td>
<td>.380</td>
<td>.079</td>
<td>.331</td>
<td>4.824</td>
<td>.000</td>
</tr>
</tbody>
</table>

- The regression equation was significant (F (4,149) = 20.983, p < 0.000), with an R2 of 0.36. Attitude (β =0.875, p < 0.01), confidence (β = 0.529, p < 0.05), and perceived empowerment (β =0.380, p < 0.01).
- Perceived barriers was not a predictor (β = 0.277 n.s.)
WHAT WE NEED

Conclusions:
- Monitoring is important but a holistic approach including all providers is needed to manage risk of MetS.
- Despite difficulties establishing and maintaining links between mental health and medical care, it is essential for people with SMI.
- The lack of consensus in terms of who should assume the primary role, is problematic.
- Psychiatric nurses need to be involved in developing and practicing in novel models, and take a lead role in working with and managing people at risk for MetS.

WHAT WE DO

Despite the increase in risks for Metabolic Syndrome and the increase in awareness of the issue, little has changed in terms of psychiatric-mental health nursing practice.

What persons with SMI know about their risks and how to decrease their risk remains unclear. Persons with SMI need to be empowered to demand all aspects of health be included in their plan of care.

New models of health care integration (incorporating mental health and physical health) need to be developed and put into practice.

Psychiatric nursing educators and administrators need to help determine the culture of integrative care.

WHAT WE NEED

Implications for psychiatric prescribers:
- Uniquely positioned to identify metabolic risks
- Do not ignore physical health issues
- Pay attention to weight gain (weigh patients/do regular waist circumference measurements)
- Consider changing medications to be more weight neutral; simplify medication regimens; decrease number of second generation antipsychotics
- Partner with primary care providers/collaborate on issues

WHAT WE NEED

Conclusions:
- Novel models should include primary care clinicians, psychiatric clinicians, nutritionists and fitness professionals.
- Holistic approaches are needed to care for the whole person.
- Health care integration is critical; psychiatric-mental health nurses must be empowered and active participants in the care process.

WHAT WE NEED

Close follow up means many opportunities to identify risks and assist with strategies to decrease risks.

Provide assessment, treatment where patients are seeking care (for those with serious mental illness, this means in the behavioral health setting).

Don’t assume the PCP is managing these risks.

Strategize with patients for behavioral changes to improve health.

WHAT WE NEED

Our next study (in process):

Looking at the perspective of the person with serious mental illness and their caregivers.
1. What do they know about risks?
2. What do they know about medications and risks?
3. What are their providers doing to assess risks?
4. What are their providers doing to help them manage or reduce risks?
WHAT WE NEED

Implications for psychiatric providers at all levels:

- Better monitoring is needed
- Imbed monitoring algorithms into practice
- Refer to and follow up with PCP providers
- Design strategies to work on health promotion activities
  - Diet/exercise/smoking cessation/stress management
  - Help access services for physical needs

New systems for providing care:

- Behavioral health imbedded in medical homes
- Medical care imbedded in psychiatric home
- Insurance reimbursement changes to allow time for health promotion visits/groups devoted to healthy lifestyle changes

REFERENCES


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