



Metabolic Syndrome, Diabetes, and Depression

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Objectives

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- 1 Learn about Metabolic Syndrome, Diabetes Mellitus, Depression and the relationship between them
 - 2 Learn how to assist your patients with prevention and treatment
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Metabolic Syndrome

Metabolic syndrome is a combination of four conditions:

1. Increased blood pressure
2. High blood sugar
3. Excess body fat around the waist
4. High cholesterol or triglyceride levels

Subsequent risk: Heart disease, stroke and type 2 diabetes

Prevalence : Up to one-third of U.S. adults

Prevention: Aggressive lifestyle changes can prevent or reverse metabolic syndrome and the consequential (serious) health problems

Diabetes Mellitus

- Diabetes mellitus is a disease that affects how your body uses blood sugar (glucose). Glucose is an important source of energy for muscle cells and other tissues and the main fuel source for your brain. Insulin produced in the pancreas moves glucose into the body's cells to provide energy. Lack of insufficient insulin leads to Diabetes
- Diabetes can lead to excess sugar in your blood, which can lead to serious health problems such as vascular disease, blindness, kidney disease, and diabetic coma
- Two Types: 1 and 2 (often abbreviated as T1DM and T2DM), as well as prediabetes and diabetes of pregnancy.
- Type 1 also know as juvenile onset, type 2 “later” onset, generally related to weight gain or older age

Diabetes Mellitus Symptoms

Things you can observe/ask:

- Frequent urination (often at night)*
- Thirst*
- Weight loss without trying
- Feeling hungry*
- Blurry vision*
- Numb or tingling hands or feet
- Feeling very tired*
- Very dry skin
- Sores that heal slowly
- Having more infections than usual

Diabetes Mellitus Risk Factors

1. Overweight (body mass index of 25 or greater) -> increase blood sugar
2. Prediabetes (high blood sugars, but no other symptoms yet)
3. Age 45 years or older
4. Have a parent or sibling with type 2 diabetes
5. Being physically active less than 3 times a week
6. Higher risk for African American, Hispanic/Latino American, American Indian, or Alaska Native, Pacific Islanders or Asian Americans

(Major) Depression

A combination of five or more of the following symptoms

- Sadness
- Decrease in interest
- Guilt feelings
- Decrease in energy
- Trouble concentrating
- Decrease or increase in appetite
- Psychomotor retardation
- Suicidal thoughts

Link Between Metabolic Syndrome, Diabetes and Depression

Multiple trajectories: Two-way street

E.g.: Stress -> High Blood Pressure -> Depression -> Overeating -> Obesity -> High cholesterol and (pre)diabetes

Metabolic Syndrome -> low grade inflammation -> depression

Non-adherence to e.g. blood pressure and diabetes medications due to depression worsens the former two.

Role of Gut Microbiome

- Gut microbiome = microbes in the gut (~ 100 trillion microbial cells)
- Brain and gut connected through nervous, immune and endocrine systems, neurotransmitters
- Stress hormones regulated by gut microbiota
- Altered biome composition in psychiatric disorders
- Medications can alter gut microbiome
- Different biome composition between lean and obese people, disappearing with healthier diet...
- Fecal transplants: Can feces help?

Which is more urgent.....

Depression, Diabetes Mellitus and Metabolic Syndrome are all deadly diseases

Treatment of one can affect/improve others

Start with highest risk, consider depression first, but treat all three simultaneously

Case

- A 40-year old overweight patient with severe depression, increased appetite, decreased energy, lack of sleep, trouble focusing, poor self-care
- Fluoxetine not helpful
- Risperidone added
- Develops obesity quickly
- prediabetes
- Worsening depression

What you can do

1. You arrange for (accompany to?) appointment with primary care doctor
2. Make a list of questions

Results of assessment by MD:

- Elevated hemoglobin A1c observed
- Metformin prescribed for blood glucose control
- High cholesterol/triglycerides diagnosed – diet/exercise recommended

Prevention (and treatment)

A healthy lifestyle

- Getting at least 30 minutes of physical activity most days
- Eating plenty of vegetables, fruits, lean protein and whole grains, PORTION CONTROL
- Limiting saturated fat and salt in diet
- Maintaining a healthy weight
- Not smoking/vaping (nicotine/marijuana)

What you can do

Observe and document any changes

Encourage:

- Healthy eating. Go grocery shopping, cook
- Adherence to medications
- Keep doctor's appointments
- Connect to others
- Moving

Diabetes Treatment and Serious Mental Illness

- Diabetes increases risk for depression 2-3 fold
- Up to 45 % of mental health disorders in diabetic patients undiscovered
- Diabetes treatment does not cause but can improve mental health disorders
- Metformin may help with weight loss.....if combined with diet and exercise

Role of psychiatric medications in Metabolic Syndrome

Risk for obesity in severe mental illness 2-3 fold increased. Young adults at higher risk

~ Ten percent of patients on antipsychotics develop diabetes

Most antipsychotics increase in appetite:

-> weight gain

-> high blood pressure

-> diabetes

-> high cholesterol

However, effects can be independent of weigh gain: e.g. decreased insulin sensitivity

Antipsychotics alter effect of hormones (ghrelin and leptin) on lipid and glucose

regulation

Role of psychiatric medications in Metabolic Syndrome

Commonly used antipsychotics and antidepressants* causing weight gain, sedation, insulin resistance (T2DM):

| Zyprexa (olanzapine) | Rexulti (brexpiprazole) | Thorazine (chlorpromazine) |
|-------------------------|-------------------------|----------------------------|
| Risperdal (risperidone) | Clozaril (clozapine) | |
| Invega (paliperidone) | Saphris (asenapine) | |
| Fanapt (iloperidone) | Vraylar (cariprazine) | |
| Seroquel (quetiapine) | Haldol (haloperidol) | |
| Abilify (aripiprazole) | Prolixin (fluphenazine) | Lithium * |
| Latuda (lurasidone) | Trilafon (perphenazine) | Remeron (mirtazapine)* |



Conclusion

- Depression can be caused by medical disorders such as diabetes mellitus or medication side effects
- Certain pharmacological treatments for depression can cause metabolic syndrome
- Metabolic Syndrome and Type 2 Diabetes are reversible
- Prevention and treatment have similarities (healthy life style)

References and Helpful links

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Stahl, S: The prescriber's guide

https://stahlonline.cambridge.org/prescribers_guide.jsf

Thank You

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