Seniors with Diabetes: Why Are They Different?

Learning Outcomes

• Describe the specific care needs for the older adult with Type 2 diabetes.

• Discuss the appropriate treatment regimens for older patient with diabetes.
Outline

• I. Specific care needs for the older adult with Type 2 diabetes
• II. Appropriate treatment regimens for older adults with diabetes

Etiology of Diabetes

• Complex, chronic disease
• Estimate 29 million individuals living in the US have diabetes
• Approximately 26% people ≥ 65 years have diabetes

Epidemiology of Diabetes in Older Adults

• Long latency period between development of Type 2 diabetes and diagnosis
• Prolonged duration of diabetes
  – On average 10 years in patients aged 65 to 79
• At risk for diabetes associated microvascular and macrovascular complications

Delayed Diagnosis in Older Adults

• Symptoms mimic common age-related changes
• Classic symptoms often are unrecognized
  – Increased thirst and urination
• Diagnosis may follow presentation of a diabetes related complication
AGING AND WEIGHT CHANGE IN OLDER ADULTS

- Lean body mass decreases
- Body fat and visceral fat increases
- Weight gain, obesity, and visceral fat associated with
  - Reduced insulin sensitivity
  - Decreased glucose uptake in muscle

FACTORS: COMPROMISING GLYCEMIC CONTROL

- Comorbidities
- Coexisting diseases
- Functional disabilities
- Geriatric Syndromes

COMORBIDITIES

- Fatty liver disease
  - Higher BMI, waist circumference, triglyceride levels and lower HDL cholesterol levels
- Obstructive sleep apnea
  - Significantly higher (Central Obesity)
- Increased risk for cancers
  - Liver, pancreas, endometrium, colon/rectum/bladder and bladder
- Arthritis
  - Limited functional ability

COMORBIDITIES

- Fractures
  - Higher risk for hip fractures
- Low testosterone in men
  - Especially with obesity
- Periodontal disease
  - Adversely affects diabetes outcomes
- Hearing impairment
  - More common in people with diabetes
    - Neuropathy and/or vascular disease

COEXISTING DISEASES

- Hypertension
- Cardiovascular disease — myocardial infarction
- Stroke
- Emphysema
- Depression
- Stage 3 or worse chronic kidney disease

FUNCTIONAL DISABILITIES

- Difficulty preparing or eating food
- Depression/social isolation
- Cognitive impairment
- Reduced visual acuity
- Limited manual dexterity
- Decreased physical activity or mobility
COGNITIVE IMPAIRMENT
- Diabetes associated with an increased risk for cognitive decline and dementia
- Presentation may range
  - Subtle executive dysfunction to memory loss to overt dementia
- May affect a patient’s ability to perform complex self-care
  - Glucose monitoring, insulin administration, preparing food, and taking medication as prescribed

OTHER IMPORTANT AREAS FOR ASSESSMENT
- Attitudes toward diabetes self care
  - Meal plan, exercise, medications
- Current self-care knowledge
  - Does patient understand self-care practices and how to perform them
- Family and social support
  - Widowed, divorced, social isolation, inability to drive
- Literacy
  - Ability to read, write, language

GERIATRIC SYNDROMES
- Polypharmacy
- Urinary incontinence
  - UTI’s, urine retention, fecal impaction, and some medications
- Injurious falls
  - Hazardous conditions in the home
- Psychotropic medications
- Persistent pain
  - Neuropathic pain, arthritis

Patient Case
- PW, 72 year old AA female, presents to clinic for 3 month follow up visit.
  - PMH: dyslipidemia, osteoarthritis, hypertension, Type 2 DM, depression, mild dementia
  - Current meds: metformin 1000 mg BID, glyburide 5 mg BID, lisinopril 10 mg QD, Norvasc 5 mg QD, acetaminophen 500 mg BID PRN
  - BG averages: fasting 200 mg/dL and bedtime 250 mg/dL
  - A1c: 9%
  - BP 145/85
  - eGFR 50 mL/min

Appropriate Treatment Regimens
- Glycemic Target
  - ADA glycemic targets
  - Customization of goal values
  - Prevention of hypoglycemia
  - Prevention of hyperosmolar hyperglycemic state (HHS)
ADA GLYCEMIC GOALS

• A1C <7%
• Preprandial capillary plasma glucose 80-130mg/dL
• Peak postprandial capillary plasma glucose <180 mg/dL

Consider life expectancy, disease duration, important comorbidities, established vascular complications, patient resources, and motivation for self-care capacities

GLYCEMIC GOALS IN OLDER ADULTS WITH DIABETES

Healthy
• Few coexisting chronic illnesses
• Intact cognitive and functional status
• A1C goal – < 7.5%
• Fasting or preprandial glucose – 90-130 mg/dL
• Bedtime glucose – 90-150 mg/dL

GLYCEMIC GOALS: OLDER ADULTS WITH DIABETES

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• Fasting or preprandial glucose – 90-130 mg/dL
• Bedtime glucose – 90-150 mg/dL

GLYCEMIC GOALS: OLDER ADULTS WITH DIABETES

Complex/Intermediate
• A1C goal <8.0%
• Fasting or preprandial glucose 90-150 mg/dL
• Bedtime glucose 100-180 mg/dL

GLYCEMIC GOALS: OLDER ADULTS WITH DIABETES

Very complex/poor health
• A1C goal <8.5%
• Fasting or preprandial glucose 100-180 mg/dL
• Bedtime glucose 110-200 mg/dL

RATIONALE FOR LESS STRIGENT GOALS

• Frail older adults

• Patients
  – Life expectancy < 5 years
  – Pronounced risk for severe hypoglycemia
  – Advanced comorbidities

HYPOGLYCEMIA OF OLDER ADULTS

• Major risk factors
  – Advanced age
  – Polypharmacy
  – Use of sulfonylureas (SU) and/or insulin
• Increased risk for medication induced hypoglycemia:
  o Slowed glucagon response
  o Inadequate food intake
  o Renal insufficiency

ADA Standards of Medical Care in Diabetes: Older Adults. Diabetes Care 2017; 40 (Suppl 1): S54-55
TREATMENT OF HYPOGLYCEMIA

- Fast acting carbohydrate (CHO)
  - Rule of 15
  - Use 4 glucose tabs, commercial liquid glucose product, ½ cup juice, 1 cup milk
- If meal delayed, follow with snack
- If person unable to swallow, administer glucagon if available

ADA Standards of Medical Care in Diabetes, Glycemic Targets, Diabetes Care 2017; 40 (Suppl 1): S54

HYPEROSMOLAR HYPERGLYCEMIC STATE (HHS)

- Life-threatening condition
- Usually precipitated by
  - Infections, drugs, dehydration
- May be insidious-gradual onset
- Classic symptoms
  - Thirst, confusion
- Treated with
  - Fluids
  - Electrolyte replacement
  - Insulin

Therapy for Diabetes Mellitus & Related Disorders, 10th ed. 2014, ch. 47

Appropriate Treatment Regimens

- Comprehensive monitoring
  - Blood glucose self monitoring
  - Screening for depression and cognitive impairment
  - A1c
  - Fasting lipid profile
  - Foot exam
  - Kidney function
  - Eye exam
  - Recommended immunizations

ADA Standards of Medical Care in Diabetes, Comprehensive Medical Evaluation & Assessment of Comorbidities, Diabetes Care 2017; 40 (Suppl 1): S25-S32

Blood Glucose Self Monitoring

- When prescribed as part of a broader educational context, SMBG results may be helpful to guide treatment decisions and/or patient self-management for patients using less frequent insulin injections or noninsulin therapies.
- When prescribing SMBG, ensure that patients receive ongoing instruction and regular evaluation of SMBG technique and SMBG results, and their ability to use SMBG data to adjust therapy.
- Glycemic goals may be relaxed in some older patients.
- Avoid hypoglycemia in older adults.


<table>
<thead>
<tr>
<th>Patient</th>
<th>Fasting/preprandial blood glucose</th>
<th>Bedtime blood glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>90 – 130 mg/dL</td>
<td>90 – 150 mg/dL</td>
</tr>
<tr>
<td>Complex/Intermediate</td>
<td>90 – 150 mg/dL</td>
<td>100 – 180 mg/dL</td>
</tr>
<tr>
<td>Very complex/poor health</td>
<td>100 – 180 mg/dL</td>
<td>110 – 200 mg/dL</td>
</tr>
</tbody>
</table>

American Diabetes Association Standards of Medical Care in Diabetes. Older Adults. Diabetes Care 2017; 40 (Suppl 1): S99-104

Blood Glucose Self Monitoring

- Most patients on multiple-dose insulin (MDI) or insulin pump therapy should do SMBG
  - Prior to meals and snacks
  - At bedtime
  - Prior to exercise
  - When they suspect low blood glucose
  - After treating low blood glucose until they are normoglycemic
  - Prior to critical tasks such as driving
  - Occasionally postprandially

Screening for Depression & Cognitive Impairment
- Older adults with DM should be considered a high-priority population for depression screening and treatment.
- Annual screening for early detection of mild cognitive impairment or dementia is indicated for adults 65 years of age or older.

Hemoglobin A1c
- Perform the A1C test at least 2x annually in patients that meet treatment goals (and have stable glycemic control).
- Perform the A1C test quarterly in patients whose therapy has changed or who are not meeting glycemic goals.

Blood Pressure
- Measure at every routine visit
- People ≥ 60 year old <150/90 mmHg (per JNC 8)
- People with diabetes and hypertension should be treated blood pressure goal of <140/90 mmHg (per ADA 2017).
  - Lower target <130/80 may be appropriate for certain individuals at high risk for CVD if they can be achieved without undue treatment burden.

Fasting Lipid Profile
- In adults not taking statins, a screening lipid profile is reasonable
  - At diabetes diagnosis
  - At the initial medical evaluation
  - And every 5 years, or more frequently if indicated
- Obtain a lipid profile at initiation of statin therapy, and periodically thereafter.
Foot Exam

- Perform a comprehensive foot evaluation annually to identify risk factors for ulcers & amputations.
  - History & 10g monofilament testing, vibration sensation (large-fiber function), and temperature or pinprick (small-fiber function)
- All patients with diabetes should have their feet inspected at every visit
- History should contain prior history of ulceration, amputation, Charcot foot, angioplasty or vascular surgery, cigarette smoking, retinopathy & renal disease, and should assess current symptoms of neuropathy and vascular disease.


Kidney Function

- At least once a year, assess urinary albumin and estimated glomerular filtration rate (eGFR)
  - In patients with type 1 diabetes duration of ≥35 years
  - In all patients with type 2 diabetes
  - In all patients with comorbid hypertension


Eye Exam

- Initial dilated and comprehensive eye examination by an ophthalmologist or optometrist
  - Adults with type 1 diabetes, within 5 years of diabetes onset.
  - Patients with type 2 diabetes at the time of diabetes diagnosis.


Recommended Immunizations

- Administer hepatitis B vaccine to unvaccinated adults with diabetes aged 19-59 years.
- Consider administering hepatitis B vaccine to unvaccinated adults with diabetes ≥ 60 years old.
- Pneumococcal: PCV 13 and PPSV 23
- Influenza
- Herpes zoster vaccine
- Td/Tdap


3ASIC MEDICAL NUTRITIONAL THERAPY PRINCIPLES

- MNT with registered dietitian
- Review of needs
  - Dietary
  - Physical activity needs
  - Supplements (i.e. vitamins)
- Obese patients
  - Meal plans incorporate moderate caloric restriction
- Consider CHO distribution throughout day

BASIC MEDICAL NUTRITIONAL THERAPY PRINCIPLES

- Constipation
  - Review of bowel function
  - Need for dietary supplements or medications
- Nutritional status and capacity to buy food
  - Food shopping, meal preparation, alcohol consumption
- Weight changes
- Adequate dentation

ADA Standards of Medical Care in Diabetes, Lifestyle Management, Diabetes Care 2017; 40 (Suppl1): S33‐S43

PHYSICAL ACTIVITY GUIDELINES

- Be as active as possible
- Exercises that maintain or improve balance
- Review physical activity relative to level of fitness
- Assess ability to do physical activity safely-pre exercise evaluation
  - Uncontrolled hypertension, autonomic neuropathy, foot lesions, untreated proliferative retinopathy

ADA Standards of Medical Care in Diabetes, Lifestyle Management, Diabetes Care 2017; 40 (Suppl1): S33‐S43

PHYSICAL ACTIVITY GUIDELINES

- Resistance exercise at least two times weekly
  - Free weights or weight machines
- Benefits
  - Improve circulation and joint flexibility
  - Increase lean body mass and muscle
  - Decrease risk for falls

ADA Standards of Medical Care in Diabetes, Lifestyle Management, Diabetes Care 2017; 40 (Suppl1): S33‐S43

Appropriate Treatment Regimens

- Pharmacotherapy
  - Beers criteria (2015)
  - ADA Standards of Care: Older Adults (2017)
  - Customization of medication regimen


ADA Standards of Care: Older Adults

- Cost
  - Medications
    - Metformin: Avoid in advanced renal insufficiency or heart failure
    - Thiazolidinediones: Very cautiously used in CHF or at risk for falls/fractures
    - Insulin Secretagogues: Adverse effect: Hyposglycemia
    - Incretin‐Based Therapies (DPP‐IV inhibitors & GLP‐1 agonists): Cost
    - SGLT2 inhibitor: Limited long term experience
    - Insulin Therapy: Must have good visual & motor skills and cognitive ability

Customization of Medication Regimen

- **Keys**
  - Achieving glycemic control while avoiding hypoglycemia
  - Start with lowest dose and go slow
  - Insurance Formulary
    - Medicare
    - Medicaid

- **Considerations**
  - Comorbidities
  - Kidney and liver function
  - Cognitive function
  - Support system
  - Risk of hypoglycemia
  - Disease Duration

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**Patient Case**

- PW, 72 year old AA female, presents to clinic for 3 month follow up visit.
- **PMH:** dyslipidemia, osteoarthritis, hypertension, Type 2 DM, depression, mild dementia
- **Current meds:** metformin 1000 mg BID, glyburide 5 mg BID, lisopril 10 mg QD, Norvasc 5 mg QD, acetaminophen 500 mg BID PRN
- **BG averages:** fasting 200 mg/dL and bedtime 250 mg/dL
- **A1c:** 9%
- **BP:** 145/85
- **eGFR:** 50 mL/min

- **What medication adjustments would you make for PW?**
Appropriate Treatment Regimens

- Individualized strategies for geriatric population
  - Achieving glycemic control while avoiding hypoglycemia
  - Considerations when selecting pharmacotherapy
    - Renal and hepatic function
    - Visual, physical and cognitive limitations
    - Support system
    - Financial

ADA Standards of Medical Care in Diabetes, Lifestyle Management, Diabetes Care 2017; 40 (Suppl 1): S33–S43

References

- American Diabetes Association Standards of Medical Care in Diabetes, Diabetes Care 2017; 40 (Suppl 1).
- Special considerations in the management and education of older persons with diabetes: AADE Practice Synopsis, December 2013.