Diabetes Health Disparities in the Latino Population

The metabolic syndrome associated with diabetes and the implications for clinical practice.

September 20, 2013
Portland, Oregon

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All efforts were made to maintain fair balance.

This will be done as little as possible and does not reflect any financial associations Dr. Aguilar has with the pharmaceutical industry.
Educational Objectives:

- Understand the definitions of Metabolic Syndrome (MS)
- Understand the current diagnostic targets for diabetes as well as treatment goals for A1c, FPG and PPG in the context of individualization of care- (ADA/EASD Position Statement)
- Discuss the basic physiology surrounding the use of many of the agents used for the treatment of T2DM.
- Be familiar with the unique ethnic/Latino, cultural, genetic and environmental factors that may impact the development of diabetes and its management.
- Be familiar with Data from several large clinical trials which studied diabetes in Latinos.
- Review some culturally tailored practices that may be suitable to the primary care setting.
Diabetes and the “Latino”

The ethnic terms *Latino* and *Hispanic* are sometimes used interchangeably

**Latino***:
Persons of any race who trace their origin to Mexico, Puerto Rico, Cuba, Central and South America, or other Spanish cultures.*

The Metabolic Syndrome

Metabolic Syndrome: Synonyms*

- Hypertension-hyperglycemia-hyperuricemia syndrome
- Syndrome X
- Dysmetabolic syndrome X
- Insulin resistance syndrome
- Metabolic dyslipidemia
- The Deadly Quartet (upper-body obesity, glucose intolerance, hypertriglyceridermia, and hypertension)
- Civilization syndrome

* https://www.clinicalkey.com/topics/internal-medicine/metabolic-syndrome.html
Metabolic Syndrome: web definition*
(Insulin resistance syndrome, Syndrome X)

MS is a name for a group of risk factors that occur together and increase the risk for coronary artery disease, stroke, and T2DM.

The Metabolic Syndrome

Metabolic Syndrome*: (Insulin resistance syndrome, Syndrome X)

The two most important risk factors for MS are:

- Extra weight around the middle and upper parts of the body (central obesity). The “apple-shaped”.
- Insulin Resistance.

The Metabolic Syndrome

Metabolic Syndrome*:

Other risk factors include:
1. Aging
2. Genetic influences
3. Hormone changes
4. Lack of exercise

Patients who have MS often have 2 other problems that can either cause the condition or make it worse:
1. Excess blood clotting
2. Abnormal levels of inflammation markers

Metabolic Syndrome
IDF (International Diabetes Federation) WHO

• A quarter of the world’s adults have metabolic syndrome

• People with metabolic syndrome are:
  1. Twice as likely to die from CHD
  2. Three times as likely to have a heart attack or stroke compared with people without the syndrome

http://www.idf.org/metabolic-syndrome
Executive Summary of the Third Report of the NCEP expert panel (ATP III), JAMA June, 2001; 285;2486-2497.
The Relationship Between Obesity, Insulin Resistance and Dyslipidemia

Adapted from Brunzell JD, et al. Diabetes Care. 1999(suppl 3) C210-C13
NCEP: Clinical Identification of the Metabolic Syndrome*

ATP III

### NCEP: Clinical Identification of the Metabolic Syndrome*

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Defining Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal obesity</td>
<td>Waist circumference</td>
</tr>
<tr>
<td>Men</td>
<td>&gt;40 in (&gt;102 cm)</td>
</tr>
<tr>
<td>Women</td>
<td>&gt;35 in (&gt;88 cm)</td>
</tr>
<tr>
<td>TG</td>
<td>≥150 mg/dL</td>
</tr>
<tr>
<td>HDL-C</td>
<td>Men &lt;40 mg/dL</td>
</tr>
<tr>
<td>Women</td>
<td>&lt; 50 mg/dL</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>≥130/≥85 mm Hg</td>
</tr>
<tr>
<td>Fasting glucose</td>
<td>≥110 mg/dL</td>
</tr>
</tbody>
</table>

AACE Clinical Criteria for Diagnosis of the Insulin Resistance Syndrome*

Additional Defining Measures

Other risk factors
- Family history of T2DM, hypertension or CVD
- Polycystic ovary syndrome
- Sedentary lifestyle
- Advancing age
- Ethnic groups having high risk for T2DM or CVD

*Diagnosis depends on clinical judgment based on risk factors.

*Circulation January 27, 2004 vol. 109 no. 3 433-438
http://circ.ahajournals.org/content/109/3/433/T3.expansion.html
Raised triglycerides
   ≥ 150 mg/dL (1.7 mmol/L)
   or specific treatment for this lipid abnormality

Reduced HDL cholesterol
   < 40 mg/dL (1.03 mmol/L) in males
   < 50 mg/dL (1.29 mmol/L) in females
   or specific treatment for this lipid abnormality

Raised blood pressure
   systolic BP ≥ 130 or diastolic BP ≥ 85 mm Hg
   or treatment of previously diagnosed hypertension

Raised fasting plasma glucose
   (FPG) ≥ 100 mg/dL (5.6 mmol/L),
   or previously diagnosed type 2 diabetes
# Metabolic Syndrome

<table>
<thead>
<tr>
<th>WHO</th>
<th>NCEP (ATPIII)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Obesity:</strong> (BMI &gt;30 Kg/m²) or visceral adiposity (WHR)*</td>
<td>Obesity: visceral adiposity WC; (M) &gt;40&quot;, (F) &gt;35&quot;</td>
</tr>
<tr>
<td><strong>Blood Pressure:</strong> Anti-hypertensive treatment or ≥ 140/90 mmHg</td>
<td><strong>Blood Pressure:</strong> Anti-hypertensive treatment or ≥ 130/85 mmHg</td>
</tr>
<tr>
<td><strong>Lipids:</strong> TG &gt;1.7 µmol/L or fibrate-treated or HDL•Chol &lt;35 mg/dL (M) &lt;39 mg/dL (F)</td>
<td><strong>Lipids:</strong> TG &gt;150 mg/dL or fibrate-treated or HDL•Chol &lt;40 mg/dL (M) &lt;50 mg/dL (F)</td>
</tr>
<tr>
<td><strong>Microalbuminuria:</strong> ≥ 20 µg/ml</td>
<td></td>
</tr>
</tbody>
</table>


*Executive Summary of the Third Report of the NCEP expert panel (ATPIII), JAMA June, 2001; 285;2486-2497.*

Waist Hip Ratio > 0.9 (M) > 0.85 (F), 1 mg/dL = 0.1 µmol/L
<table>
<thead>
<tr>
<th>Total patients</th>
<th>Positive for both methods</th>
<th>Concordantly negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1569</td>
<td>1113</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td>71%</td>
<td>12%</td>
</tr>
</tbody>
</table>


- 65% of patients had A1c <8.0%, 58% on oral therapy and 3.8% on insulin
Metabolic Syndrome

New IDF WORLDWIDE DEFINITION OF THE METABOLIC SYNDROME: **WHO**

- For a person to be defined as having the MS, the new definition **Required** they have central obesity, plus **two** of the following four additional factors: raised triglycerides (TG), reduced HDL-cholesterol, raised blood pressure or raised fasting plasma glucose level.

- **Gender** and, for the first time, **ethnicity** specific cut-off points for central obesity as measured by waist circumference were included.

http://www.idf.org/metabolic-syndrome
1. For Japanese women and men the established cut points were changed:
   >80cm in women (31.4 inches)
   >90cm in men (35.4 inches)

2. Waist Circumference: ATPIII
   >35 inches Female
   >40 inches Male

2. Executive Summary of the Third Report of the NCEP expert panel (ATPIII), JAMA June, 2001; 285;2486-2497.
Age-Adjusted Prevalence of the Metabolic Syndrome by Race/Ethnicity Among US Adults

Insulin Resistance Syndrome in African Americans*

Additional Defining Measures

Other risk factors

1. African-American women and Hispanic men and women have the highest prevalence of the Metabolic Syndrome.

2. The lower reported rates of metabolic syndrome in Blacks can be partly ascribed to the lower prevalent rates of some major components of metabolic syndrome, TG and HDL cholesterol levels.

The higher prevalence of HTN and CKD in Blacks suggests that the current classification, definition, and criteria for metabolic syndrome in Blacks needed to be reconsidered.

UKPDS: Average Risk Reductions for Every 1% Reduction in A1C

Decrease in risk with 1% reduction in updated mean A1C (%)

- Microvascular complications
- Peripheral vascular disease
- Myocardial infarction
- Stroke
- Heart failure
- Cataract extraction

* P < 0.0001; †P = 0.035; ‡P = 0.016;
§ Lower extremity amputation or fatal peripheral vascular disease
UKPDS = UK Prospective Diabetes Study

Management of Hyperglycemia in Type 2 Diabetes: A Patient-Centered Approach

Position Statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)
ANTI-HYPERGLYCEMIC THERAPY

• Glycemic targets
  - HbA1c < 7.0% (mean PG ~150-160 mg/dl [8.3-8.9 mmol/l])
  - Pre-prandial PG <130 mg/dl (7.2 mmol/l)
  - Post-prandial PG <180 mg/dl (10.0 mmol/l)
  - Individualization is key:
    - Tighter targets (6.0 - 6.5%) - younger, healthier
    - Looser targets (7.5 - 8.0%+) - older, comorbidities, hypoglycemia prone, etc.
  - Avoidance of hypoglycemia
Approach to management of hyperglycemia:

- **More stringent**
  - Patient attitude and expected treatment efforts: highly motivated, adherent, excellent self-care capacities
  - Risks potentially associated with hypoglycemia, other adverse events: low
  - Disease duration: newly diagnosed
  - Life expectancy: long
  - Important comorbidities: absent
  - Established vascular complications: absent
  - Resources, support system: readily available

- **Less stringent**
  - Patient attitude and expected treatment efforts: less motivated, non-adherent, poor self-care capacities
  - Risks potentially associated with hypoglycemia, other adverse events: high
  - Disease duration: long-standing
  - Life expectancy: short
  - Important comorbidities: few / mild
  - Established vascular complications: few / mild
  - Resources, support system: limited
Pharmacologic Effect on Glycemic Control: Reduction in A1c
(Data Based On Clinical Trials/PI information)

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Mode of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfonylureas/Meglitinides</td>
<td>↑ Insulin Release</td>
</tr>
<tr>
<td>Metformin</td>
<td>↓ Gluconeogenesis &amp; “IR”</td>
</tr>
<tr>
<td>Thiazolidinediones</td>
<td>Insulin Sensitizers</td>
</tr>
<tr>
<td>Alpha-glucosidase inhibitors</td>
<td>Delay glucose absorption</td>
</tr>
<tr>
<td>Incretin Mimetics</td>
<td>β-cell and non β-cell effects</td>
</tr>
<tr>
<td>DPP IV Inhibitors</td>
<td>Inhibit DPP IV = ↑ Native GLP-1</td>
</tr>
<tr>
<td>Amylin analog</td>
<td>Suppress glucagon/+satiety</td>
</tr>
</tbody>
</table>
Pharmacologic Effect on Glycemic Control: Reduction in A1c

(Data Based On Clinical Trials/PI information)

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Mode of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bile acid sequestrans</td>
<td>Bind bile acids</td>
</tr>
<tr>
<td></td>
<td>↓ Hepatic glucose production</td>
</tr>
<tr>
<td>SGLT-2 Antagonist “Glucuretics”</td>
<td>↑ Glucose loss in the urine</td>
</tr>
<tr>
<td></td>
<td>(↓ Blood pressure)</td>
</tr>
<tr>
<td></td>
<td>(↓ Weight)</td>
</tr>
</tbody>
</table>
OTHER CONSIDERATIONS

• Sex/ethnic/racial/genetic differences
  - MODY & other monogenic forms of diabetes
  - Latinos: more insulin resistance
  - East Asians: more beta cell dysfunction
  - Gender may drive concerns about adverse effects
    (e.g., bone loss from TZDs)
Projected Increase in the US Population with Diagnosed Diabetes by 2020 by Ethnicity

Diabetes Health Disparities in the Latino Population

• US healthcare system, costs of diabetes treatment increased from $174 billion in 2007 to $245 billion in 2012.¹
• Projected increase to $333 billion by 2034.²
• Hispanic/Latino population is the largest and fastest growing minority group in the US, with an annual national growth rate of 3.2%.
• By 2050, Latinos may constitute up to 30% of the US population.³

Total per-capita health care expenditures are:
1. Lower among Hispanics ($5,930)
2. Higher among non-Hispanic blacks ($9,540)
3. vs. Non-Hispanic whites ($8,101).

Non-Hispanic blacks also have 75% more emergency department visits than the population with diabetes as a whole.

Diabetes Health Disparities in the Ethnic Populations

Compared to non-Hispanic whites:

1. Per capita hospital inpatient costs are 41.3% higher among non-Hispanic blacks
2. 25.8% lower among Hispanics.

Diabetes Health Disparities in the Latino Population

• Are at increased risk for obesity and T2DM compared with Whites.¹
• Develop diabetes at younger ages and with lower BMI.¹
• Age-adjusted prevalence of diabetes in 2006 was 16% in Mexican American adults compared with 9% in non-Latino Whites.²
• Higher prevalence of metabolic syndrome and adolescent diabetes.³

Diabetes Health Disparities in the Latino Population

Diabetes Related complications: Cultural or genetic factors may contribute to an increased risk of developing diabetic complications.*

1. KPNC: despite insurance coverage the incidence of ESRD was significantly higher in Latinos.*

2. Latinos: less active lifestyle and higher proportion of dietary fat.¹ ²

3. Greater propensity for IR.³


Diabetes Health Disparities in the Latino Population
The Insulin Resistance Atherosclerosis Study (IRAS)

• **Purpose**
  - The healthcare treatment of non-Latino whites was compared with healthcare treatment of Latinos and African-Americans with T2DM and its complications

• **Population**
  - Data from the IRAS study (1993-1998), N=452

• **Results**
  - Latinos and AA were as likely to receive treatment for their diabetes HTN, hyperlipidemia, albuminuria, and CAD as non-Latino whites.
  - Latinos and AA were more likely to have poorly controlled diabetes and HTN compared to non-Latino whites

# Trends in T2DM Prevalence in High-Risk Populations:

Retrospective Analysis of >2000 patients

<table>
<thead>
<tr>
<th>Prevalence of Diabetes</th>
<th>A1c &gt;7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11% NHW</td>
<td>19% NHW</td>
</tr>
<tr>
<td>21% AA</td>
<td>33% AA</td>
</tr>
<tr>
<td>29% Hispanic</td>
<td>66% Hispanic</td>
</tr>
</tbody>
</table>

Ness. et. al. *Coron Artery Dis.* 1999, July; 10(5): 343-346 #2769  Mount Sinai School of Medicine, New York
Academic hospital based geriatric practice mean age 80 ±8 years. NHW= non-Hispanic white, AA= African-American
Diabetes Health Disparities in the Latino Population

- Meta-analysis reported HbA1c values for Latinos 0.5% higher than non-Latinos Whites.¹

- Data from NHANES reported a higher proportion of Latinos with “severely elevated” HbA1c levels.²
  - Latinos: >10% had an HbA1c >11%
  - Whites: 1.7% had an HbA1c >11%

- Data from NHANES showed that roughly 62% of Latinos with diabetes were above the ADA target of <7% HbA1c

Despite the higher prevalence of obesity and risk factors for CV disease in the Latino population, Latinos have a LOWER risk of CV-related mortality. "Hispanic Paradox"¹⁻³

Not all studies report similar findings of reduced CV mortality risk (Diabetes Care, Obesity and Am J Epidemiol)

↑ Retinopathy

↑ Amputation

Higher incidence of failed Lower extremity bypass surgery leading to amputations despite NO difference in PVD

Diabetes Health Disparities in the Latino Population
What can be done?

Education and Lifestyle Changes

The Home and Cultural Environments may pose challenges that are unique for Latinos.¹

• Reluctance to part with traditional foods
• Intolerance to foods
• Feeling pressure from family/friends to eat during family events or holidays
• Lack of facilities for exercise, sidewalks in certain neighborhoods.

Diabetes Health Disparities in the Latino Population
What can be done?

Cultural Barriers and Opportunities¹

*The Practitioner:*

- Minority patients *don’t care* about their health.
- Biomedicine is right.
- Science is the only basis for practice.
- Traditional beliefs *should be changed* rather than built upon.
- People *will follow directions* given by health practitioners.
- Adherence *failure is the patient’s problem.*

Ethnic differences in appointment keeping may be an important factor in poor health outcomes among Latino and African American patients with diabetes.

Survey of data and medical records for nearly 13,000 participants in the NIH-funded Diabetes Study of Northern California (DISTANCE) found that some minorities missed scheduled appointment with their primary care providers twice as often as others.

Latinos and African-Americans had the lowest rates.

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The Actions, Attitudes and Beliefs of the Healthcare Team Can Strongly Influence Treatment

“The success of culturally tailored aspects of care, such as inclusion of peer educators and communications in Spanish, are … important in the physician-patient Relationship.” *

- Culturally sensitive health education programs have proven beneficial for Latinos with diabetes, particularly when community health workers are included and when meetings are conducted in Spanish. ¹ ²

Diabetes Health Disparities in the Latino Population

Culturally Competent Management

The Centers for Disease Control Racial and Ethnic Approaches to Community Health (REACH) program.¹

- Designed to eliminate racial and ethnic health disparities in 8 disease states including diabetes.
- Utilized trained community residents to deliver 5 monthly 2-hr group meetings on healthy lifestyle modifications
- Demonstrated efficacy of community-based programs that provide culturally sensitive care to Latino patients.

Diabetes Health Disparities in the Latino Population

Culturally Competent Management

Verbal and nonverbal communication and personal interaction may play an important role in how Latino patients respond to healthcare professionals.¹

- Respect, sympathy in interpersonal relationships between Latinos and HCPs have demonstrated reductions in HbA1c of up to 0.8% (Project Dulce).²

Health Perspectives of Some Latino Persons With Diabetes

• Patients may not take their diabetes seriously until they develop complications.¹ *(Machismo²)*

• Patients may feel that treating diabetes is hopeless, or that their diabetes is an act of God.¹ *(Fatalismo²)*

• Language difficulty is more of a barrier than economics.¹

• Alternative treatments are often used—but the clinician won’t know unless he/she asks.¹

• Stories/recommendations from family and friends strongly influence patient behavior.¹ *(Familismo/Comadre²)*

The Perspectives of Some Latino Persons with Diabetes

Strong family dynamics

• **Positive**
  - Families often come as a group to the office visit
  - Enhances adherence to regimen
  - Family provides valuable emotional support

• **Challenges**
  - Women with diabetes may have family obligations which may hinder self-care
  - The belief that the woman’s needs are secondary to the good of her family (fatalismo)
  - Costs of medications and supplies were considered less important than the family needs.

Lipton RB. et al. Diabetes Educ. 1998;24(1);67-71
The Attitudes and Beliefs of Physicians and the Healthcare Team Can Strongly Influence Treatment Recommendations

- Personalize the relationship
  • Ask questions
  • Respect your patient’s needs
  • Create an alliance with the patient and family

- Consider employing Spanish-speaking staff

- Obtain bilingual diabetes educational materials

- Prescribe diabetes education when possible
  • (CDE certified nurses and dietitians)
Diabetes Health Disparities in the Latino Population

Management with Education and Lifestyle Changes

The **DPP** evaluated lifestyle intervention on lowering the risk of developing DM which included 16% Latinos.

- Latino men and women lost a mean of 7.8% and 7.1% of body weight, respectively in the intensive lifestyle modification group

Similar finding of weight loss were reported in other studies, *(Look AHEAD trial).*

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Diabetes Health Disparities
When dealing with the elderly Latino, remember—

“Respeto”*

• In dress and demeanor
• Address in respectful manner
• Do not ignore elder
• Explain without appearing condescending

Diabetes Health Disparities
When dealing with the elderly Latino, remember-

“Familia” (family)

- Allow for family members or friends to be present during the office visit
- Be sensitive to family dynamic but allow the patient to express themselves

Summary: Metabolic Syndrome, Diabetes and the impact on ethnic populations.

- There are various and differing criteria for MS but they include obesity plus several clinical risk factors including BP, Lipids, glycemia and ethnic components.
- Some Ethnic populations have a higher prevalence of MS.
- Ethnic populations reflect higher (non-Hispanic blacks) as well as lower (Hispanic) costs for US health care expenditure per capita compared to Non Hispanic whites. (2013 ADA)
- There are number of different classes of medications to treat T2DM, two classes (TZD’s and Metformin) specifically address Insulin Resistance.
Summary: Metabolic Syndrome, Diabetes and the impact on ethnic populations.

- Glycemic targets & BG-lowering therapies must be individualized.
- Cultural and/or genetic factors may contribute to an increased risk of developing diabetic and its complications
- There are unique cultural challenges in treating the Latino patient with diabetes.
- Culturally sensitive health education programs have proven beneficial for Latinos with diabetes.
Thank you

Questions...