Epidemiology and Prevention of Cardiovascular Disease in South Asian Indians

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Background

- Earliest literature from Singapore 1950s comparing ethnic Indians to ethnic Chinese and Malays
- 1970s literature in the U.K. and East Indies
- 1980s literature in the U.S.
- 1990s comparison of Indian populations to diaspora populations
Scope

- 2010 - Asian Indians will be 60% of the world’s cardiac patients
- 100 million patients predicted
- designated as an “at risk” special population in Healthy People 2010
South Asians in the United States

Total US Population: 1,678,765

California 314,819 (18.8%)
Texas 129,365 (15%)
Illinois 124,723 (7.4%)
Michigan 54,631 (3.3%)
New York 251,724 (15%)
New Jersey 169,180 (10.1%)
Maryland 49,909 (3%)
Pennsylvania 57,241 (3.4%)
Virginia 48,815 (2.9%)
Florida 70,740 (4.2%)
Percent of Persons Who Are Asian Indian, by County

Data Classes

<table>
<thead>
<tr>
<th>Percent</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 0.5</td>
<td>Lightest Green</td>
</tr>
<tr>
<td>0.6 - 1.5</td>
<td>Light Green</td>
</tr>
<tr>
<td>1.6 - 3.3</td>
<td>Green</td>
</tr>
<tr>
<td>4.0 - 6.9</td>
<td>Dark Green</td>
</tr>
<tr>
<td>7.8 - 11.2</td>
<td>Darkest Green</td>
</tr>
</tbody>
</table>

Features

- Major Road
- Stream/Waterbody

Items in gray text are not visible at this zoom level.

Approx. 65 miles across.
Men Age 25-84

Risk Factors explored

- elevated serum cholesterol
- smoking
- hypertension
- Apolipoprotein B and E
- Fibrinogen
- Lp(a)
- Homocysteine
More Potential Risk factors

- Vessel size/caliber
- Endothelial function
- Diet, exercise
- Acculturation stress
- Visceral adiposity
- Low HDL, high triglycerides
- Apo A1
Insulin Resistance?

- Barker hypothesis
- Low birth weight
- Obesity, low HDL, high triglycerides, elevated fasting glucose, HTN
Insulin Resistance Studies

- Stanford 1994 - 22 Asian Indian Men and Women compared to whites
- Asian Indians had higher fasting plasma triglyceride and lower HDL-C
- Asian Indians had increased glucose consistent with insulin resistance.

- Laws, 1994
Heterogeniety within the South Asian Indian Population
Who should be the referent group?
## CVD Risk Factors (SHARE Study)

<table>
<thead>
<tr>
<th>Factor</th>
<th>South Asians (n=342)</th>
<th>Europeans (n=326)</th>
<th>Chinese (n=317)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic BP (mm Hg)</td>
<td>119</td>
<td>118</td>
<td>119</td>
</tr>
<tr>
<td>Diastolic BP (mm Hg)</td>
<td>76</td>
<td>73</td>
<td>75</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>26.0</td>
<td>28.4</td>
<td>25.1</td>
</tr>
<tr>
<td>Women</td>
<td>26.5</td>
<td>26.6</td>
<td>22.8</td>
</tr>
<tr>
<td>Waist-to-hip ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>0.93</td>
<td>0.94</td>
<td>0.90</td>
</tr>
<tr>
<td>Women</td>
<td>0.84</td>
<td>0.80</td>
<td>0.81</td>
</tr>
<tr>
<td>LVH by ECG (%)</td>
<td>4.1</td>
<td>1.3</td>
<td>3.8</td>
</tr>
</tbody>
</table>

SHARE=Study of Health Assessment and Risk in Ethnic groups in Canada.

Newer Risk Factors (SHARE Study)

<table>
<thead>
<tr>
<th>Factor</th>
<th>South Asians (n=342)</th>
<th>Europeans (n=326)</th>
<th>Chinese (n=317)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homocysteine (µmol/L)</td>
<td>11.1</td>
<td>9.9</td>
<td>9.1</td>
</tr>
<tr>
<td>Lp(a) (mg/dL)</td>
<td>2.93</td>
<td>2.59</td>
<td>2.59</td>
</tr>
<tr>
<td>Glucose (mg/dL)</td>
<td>98.5</td>
<td>92.4</td>
<td>93.5</td>
</tr>
</tbody>
</table>

SHARE=Study of Health Assessment and Risk in Ethnic groups in Canada

Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies

WHO expert consultation*

A WHO expert consultation addressed the debate about interpretation of recommended body-mass index (BMI) cut-off points for determining overweight and obesity in Asian populations, and considered whether population-specific cut-off points for BMI are necessary. They reviewed scientific evidence that suggests that Asian populations have different associations between BMI, percentage of body fat, and health risks than do European populations. The consultation concluded that the proportion of Asian people with a high risk of type 2 diabetes and cardiovascular disease is substantial at BMIs lower than the existing WHO cut-off point for overweight (≥25 kg/m²). However, available data do not necessarily indicate a clear BMI cut-off point for all Asians for overweight or obesity. The cut-off point for observed risk varies from 22 kg/m² to 25 kg/m² in different Asian populations; for high risk it varies from 26 kg/m² to 31 kg/m². No attempt was made, therefore, to redefine cut-off points for each population separately. The consultation also agreed that the WHO BMI cut-off points should be retained as international classifications. The consultation identified further potential public health action points (23.0, 27.5, 32.5, and 37.5 kg/m²) along the continuum of BMI, and proposed methods by which countries could make decisions about the definitions of increased risk for their population.
<table>
<thead>
<tr>
<th>Classification of Obesity</th>
<th>BMI (kg/m²) Proposed Asian Criteria</th>
<th>BMI (kg/m²) Previous WHO Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>&lt;18.5</td>
</tr>
<tr>
<td>Normal Weight</td>
<td>18.5 to &lt;23</td>
<td>18.5 to &lt;25</td>
</tr>
<tr>
<td>Overweight</td>
<td>23 to &lt;25</td>
<td>25 to &lt;30</td>
</tr>
<tr>
<td>Obese</td>
<td>&gt;25</td>
<td>&gt;30</td>
</tr>
</tbody>
</table>

Note: no association of waist circumference

The Y-Y Paradox: Limitations of BMI as Measure of Adiposity Across Populations

Identical BMIs

Big difference in body fat

Future Directions

- Epidemiologic evidence in the US
- Population based surveys
- Culturally tailored instruments
- Larger studies of lipid and genetic markers
- Pairing survey information with biomarkers
- Prevention and Treatment intervention trials
Research Conducted by:
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Internal Medicine, Clinical Epidemiology
Stanford Center for Research in Disease Prevention
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SOUTH ASIAN INDIAN WOMEN WEIGHT LOSS STUDY

Quick Jumps to Areas on this Page:
Overview of the Study
Hypothesis
Background and Significance
Study Design and Methods
Screening
Insulin Sensitivity Test
Meal Profile
Dietary Treatment
Time Commitment
Benefits
Change in Weight (kg)

P < 0.0001, N=22
Change in SSPG (mg/dL)

P < 0.0001, N=22
Change in Fasting Glucose

Fasting Glucose

Pre
Post

P = 0.004, N=22
Change in Triglycerides

P = 0.003, N=22

Triglycerides mg/dl

P = 0.003, N=22
### Risk Factors for Heart Disease

**Non-modifiable**
- Age
- Family history
- Gender

**Modifiable**
- Physical Inactivity
- Obesity
- High fat diet
- High Blood Pressure
- Diabetes
- High Cholesterol
- Cigarette Smoking
Key Tests for Heart Disease Risk

- Do you smoke?
- Blood pressure
- Blood cholesterol
- Fasting plasma glucose (diabetes)
- Body mass index (BMI) – ratio of height to weight (kg/m²)
TOBACCO #1 PREVENTABLE RISK

- Second-hand smoke increases cardiac risk.
- The health benefits of quitting smoking begin immediately.
- Many people who quit smoking successfully have tried and failed many times.
- Ask about low cost or free programs to help you or someone you care about stop smoking.
Blood Pressure

- Reduces the chance of:
  - Stroke: 35-40 %
  - Heart Attack: 20-25 %
  - Heart Failure: 50 %
- A person who has a normal blood pressure at age 55 has a 90% lifetime chance of developing hypertension.
- OPTIMAL: <120 systolic and <80 diastolic

American Heart Association website:
www.americanheart.org
Lifestyle Change: What Difference Does it Make?

- Weight loss. (decreases SBP*1.6 mm Hg for each kg lost)

- Dietary Approaches to Stop Hypertension: DASH diet:
  - (decreases systolic BP 8-14 mmHg)

- Reducing salt in the diet. (decreases SBP 2-8 mmHg)

- 30-45 minutes daily aerobic exercise
  - (decreases systolic BP 4-9 mmHg)

- Limit alcohol. (decreases SBP 2-4 mm Hg)

- Avoidance of tobacco products.
The Lipid Profile: Know Your Numbers!

- Total Cholesterol Goal: < 200 mg/dL
- Low Density Lipoprotein Cholesterol or LDL Goal: < 100 mg/dL
- Triglycerides Goal: < 150 mg/dL
- High Density Lipoprotein Cholesterol (HDL) > 40 mg/dL for men, > 50 mg/dL for women
- Lifestyle is the key: dietary changes, exercise, weight loss
American Diabetes Association (ADA) Guidelines

- Optimal fasting blood sugar < 100 mg/dL

- Criteria for diabetes
  - Fasting glucose 126 mg/dL or higher
  - Random glucose 200 mg/dL or higher

- Impaired fasting glucose 100 - 125 mg/dL

- People at risk for diabetes who follow a diet and exercise plan (with only a modest weight loss) can decrease their risk of developing diabetes by almost 50%.
Obesity and Diabetes Trends

Health Consequences of Obesity

- High blood pressure
- High blood cholesterol
- Type 2 diabetes
- Insulin resistance
- Coronary heart disease
- Angina pectoris
- Congestive heart failure
- Stroke
- Gall bladder disease
- Gout, Osteoarthritis
- Obstructive sleep apnea and respiratory problems
- Some types of cancer
- Poor female reproductive health
- Bladder problems
- Kidney stones
- Psychological disorders
Where Does Exercise Come In?

- EVERYWHERE!
- Exercise helps lower blood pressure.
- Exercise helps prevent diabetes.
- Exercise helps raise HDL (good cholesterol).
- Exercise helps manage stress.
- Exercise helps bone health.
Portion Size

SPAGHETTI AND MEATBALLS

20 Years Ago
500 calories
1 cup spaghetti with sauce
and 3 small meatballs

Today
1,025 calories
2 cups of pasta with sauce
and 3 large meatballs

Calorie Difference: 525 calories
To Survive a Heart Attack

- Call 9-1-1 within minutes—5 minutes at most
- Emergency medical personnel will begin treatment at once
- Don’t drive yourself to the hospital
- Uncertainty is normal—don’t be embarrassed by a false alarm
- Plan ahead
- Learn the warning signs
How To Lower Heart Disease Risk

- Begin today
- Be physically active—30 minutes of moderate-intensity activity on most days of the week
- Follow a healthy eating plan
  - Limit Portion Sizes
  - Count Calories (1500 for women, 1800 for men)
  - Low in saturated fat and cholesterol and moderate in total fat
  - Limit salt and sodium
  - If you drink alcoholic beverages, have no more than one a day
Internet Resources

National Heart Lung and Blood Institute
(http://www.nhlbi.nih.gov)

American Heart Association
(http://www.americanheart.org,
www.goredforwomen.org)
In Summary

- Know the symptoms of heart disease.
- Know your risk factors for heart disease.
- Visit your healthcare provider:
  - Discuss your risk factors
  - Ask questions about your heart tests
- Maintain a healthy lifestyle.
- Heart disease is largely preventable.
Google search terms:

AAPI Nutrition

Indian Foods: AAPI’s Guide To Health, Nutrition, and Diabetes

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Thank You!