The South Asian Cardiovascular Epidemic and a Vision for the Future

Shoeb J. Sitafalwalla, MD
Medical Director
South Asian Cardiovascular Center

Advocate Lutheran General Hospital
Inspiring medicine. Changing lives.
No Disclosures
South Asian Defined

- Asian Indian
- Pakistani
- Bangladeshi
- Sri Lankan
- Nepalese
A NOT so uncommon story...

- 33 year Asian Indian man
- No past medical history, no tobacco, no alcohol
- Not obese with a BMI = 24
- New father with a 4 month old son
- Wife works as a nurse
- Family History: father died at 64 of a heart attack
- Presents with chest pain while driving his son to the pediatrician
Framingham Risk Calculator

- Age: 33 years old
- Gender: Male
- Total Cholesterol: 190 mg/dl
- HDL: 30 mg/dl
- Smoker: NO
- SBP: 130 mm Hg

Total Risk over 10 years of having a heart attack: 1%!!!!!!
Bad Luck?  Example of a Larger Issue
The Community
National Growth

Growth of South Asians in the United States

2000: 1,678,765
2010: 2,843,391

70% increase
Local Growth

Growth of South Asians in Illinois

- 2000: 124,723
- 2010: 188,328

50% growth from 2000 to 2010.
Local Growth

Proportion of South Asians in Chicago Metro Area

Chicago Metro Area: 91%

South Asians: 9%
Illinois South Asian Age Breakdown

Percentage of Population by Age

- <5 years: 8.3%
- 5 - 17 years: 15.6%
- 18 - 24 years: 9.9%
- 25 - 34 years: 24%
- 35 - 44 years: 16.3%
- 45 - 54 years: 10.8%
- 55 - 64 years: 9%
- 65 - 74 years: 4.4%
- 75+ years: 1.8%

Advocate Lutheran General Hospital
The Epidemic
Study of Health Assessment and Risk in Ethnic groups (SHARE) – Lancet 2000

- 985 participants in Canada of South Asian, European, and Chinese origin
  - Immigrants and 2\textsuperscript{nd} generation South Asian Canadians
- CV Disease by carotid ultrasound or ECG criteria
- Traditional and novel risk factors investigated
Prevalence of Cardiovascular Disease

- South Asians: 10.7%
- Europids: 5.4%
- Chinese: 2.4%

SHARE Study, Lancet 2000
Coronary Artery Disease in Indians (CADI) Study – IHJ 1996

- 1688 Asian Indians (physicians and families)
  - 1131 Men
  - 557 Women
- Age adjusted history of myocardial infarction or angina 3 times greater than Framingham Offspring Study among men.
Mortality from Ischemic Heart Disease in the United States

Younger and Sicker

Percent of Heart Attacks By Age in South Asian Men

30% of cardiac deaths occur under the age of 65

Sharma et al, Vascular Health & Risk Management, 2005
Mothers, Wives, & Sisters....

- British Heart Foundation
  - Cardiac deaths amongst South Asian Women 51% higher than the general population.
  - Amongst 6 ethnic groups, South Asian Women were the only individuals to experience an increase in proportional heart disease deaths.
- M. Gupta et al (Canadian Journal of Cardiology, 2006)
  - Asian Indian women 2 times more likely to have triple vessel disease or left main disease when compared to Caucasians.
The Clinical Risk
The Perfect Storm

Increased Cardiovascular Disease Risk

**Metabolic Syndrome**
- 20-30% prevalence of DM
- “thin-fat” phenotype

**Poor HDL**
- Small HDL particle size
- ↓HDL2b

**Toxic LDL**
- ↑ApoB100/ApoA-1
- 2x greater LDL particles than whites

**Novel Factors**
- Lp(a)
- Homocystiene
- hsCRP

**Lifestyle Issues**
- Physical Inactivity
- Misleading Vegetarian Diet

**Advocate Lutheran General Hospital**

Gupta et al, Circulation 2006
The Classic South Asian Lipid Profile

<table>
<thead>
<tr>
<th>Factor (mg/dl)</th>
<th>SHARE</th>
<th>SABRE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>South Asian</td>
<td>European</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>211.77</td>
<td>184.6</td>
</tr>
<tr>
<td>LDL</td>
<td>128.7</td>
<td>123.63</td>
</tr>
<tr>
<td>HDL</td>
<td>38.56</td>
<td>46.41</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>174.44</td>
<td>145.96</td>
</tr>
</tbody>
</table>

Table 1. Compiled lipid data from Study of Health Assessment and Risk in Ethnic groups (SHARE) and Relationship Between Metabolic Risk Factors and Incident Cardiovascular Disease in Europeans, South Asians, and African Caribbeans [Southall and Brent Revisited] (SABRE) Studies.3,5 Data from SABRE Study was converted from mmol/L to mg/dl.

Advocate Lutheran General Hospital
The Gap

Lipid modification

Cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease

Issued: May 2008 last modified: March 2010

NICE clinical guideline 67
guidance.nice.org.uk/ng67

Introduction

Cardiovascular disease (CVD) is the leading cause of death in England and Wales. In 2005, CVD was the cause of one in three deaths, accounting for 124,000 deaths; 39,000 of those who died were younger than 75\textsuperscript{th}. For every one fatality, there are at least two people who have a major non-fatal CVD event.

CVD predominantly affects people older than 50 and age is the main determinant of risk. Apart from age and sex, three modifiable risk factors – smoking, raised blood pressure and raised cholesterol – make a major contribution to CVD risk, particularly in combination. These account for 80% of all cases of premature coronary heart disease (CHD). The risk of a future CVD event can be calculated from these risk factors and people at highest risk can be identified. There are also major identifiable population groups at particular risk. CVD is strongly associated with low income and social deprivation, the lifetime burden is greater in women because of their longevity and their increased risk of stroke over the age of 75\textsuperscript{th}. South Asian men are more likely to develop CVD at a younger age. Family history of premature CHD identifies an important group that contains people with a genetic predisposition.
Toxic South Asian LDL

- Small lipid particles
- Prone to oxidation
- ↑ApoB100/ApoA-1
- KR Kulkarni
  - SA with LDL particles 2 times greater than Caucasians
Less Protective HDL

HDL

- NC Bhalodkar
  - South Asian HDL smaller than Caucasians
- Nat’l Asian Indian Heart Disease Project
  - ↓HDL2b

Advocate Lutheran General Hospital
Lipoprotein (a)

- Inherited lipid particle
- LDL “like” particle
  - Promote plaque deposition and smooth muscle proliferation
- Plasmin “like” particle
  - Inhibit fibrinolysis
- \( \text{Lp}(a) \) 20 – 30 mg/dl
  - 2-3 fold increase in acute MI and restenosis post revascularization
- \( \text{Lp}(a) > 55 \text{ mg/dl} \) with low HDL and high TC/HDL
  - MI risk increases to 100-fold

Narasimhan et al, Cardiology In Review 2012
Homocysteine

- Hyperhomocysteinemia (>15 μM) contributes to venous and arterial thrombosis
- Boushey et al (JAMA 1995) 1μM increase in homocysteine led to a 12% and 16% increase in CAD among men and women, respectively.
- Chambers et al (Lancet 2000) Asian Indians in the UK had homocysteine levels 8% higher compared to Europeans with a 200% greater incidence of CHD related death
Diabetes and Metabolic Syndrome

- American Diabetic Association: 8.3% prevalence of DM within the United States
- M. Kanaya et al (Metab Syndr Relat Disord. 2010) → South Asian Americans diabetic prevalence of 29%, prediabetes of 37%
- South Asians: higher visceral fat, less lean muscle, thicker truncal skin folds
- International Diabetes Federation developed ethnic specific waist circumference cut offs
  - Men: 35 inches vs 40 inches
  - Women: 31 inches vs 35 inches
SACC June 2013 Heart Fair
HgBa1c Frequency Distribution

317 Total
63% pre-diabetic or diabetic
# INTERHEART: 9 risk factors for 90% of Heart Attacks

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Other Populations</th>
<th>South Asians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated Apo B / Apo A1</td>
<td>31.8%</td>
<td>43.8%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>7.2%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>23.6%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>50.6%</td>
<td>59.2%</td>
</tr>
<tr>
<td>Not Obese (by BMI)</td>
<td>66%</td>
<td>70.4%</td>
</tr>
<tr>
<td>Moderate to high physical activity</td>
<td>21.6%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Daily fruits/vegetables</td>
<td>45.2%</td>
<td>26.5%</td>
</tr>
<tr>
<td>Alcohol &gt; 1 per week</td>
<td>26.9%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Psychosocial stress</td>
<td>18%</td>
<td>14%</td>
</tr>
</tbody>
</table>
A Vision for the Future
A Three Part Model

- Influential Council of Advisors
- Social Media
- Faith Community Collaboration
- Governmental Partnerships
- Behavior Modification
- American Heart Association
- Advocate Lutheran General Hospital
Announcing Two New Strategically Focused Research Network Topics!

The AHA Board of Directors has approved the topics for the next two Strategically Focused Research Networks (SFRN). The second SFRN will focus on HYPERTENSION and the third SFRN will focus on DISPARITIES IN CARDIOVASCULAR DISEASE.

Also in this issue:
South Asian Ethnicity – An Underscored Cardiovascular Risk
Metabolic Syndrome Guidelines for Populations Around the World. How Do Screening Tools Differ?

This issue is sponsored by the Midwest Lipid Association
Another not so uncommon story...

- 42 year old South Asian male
- Two young children and a wife
- Brother recently admitted for chest pain and mother with premature heart disease
- Total Cholesterol = 206 mg/dl
- LDL = 129 mg/dl
- HDL = 37 mg/dl
- Triglycerides = 199 mg/dl
Went to his Primary Care Physician

- Placed on 1000mg of Omega 3 Fish Oil
- Told to eat a heart healthy diet

10-Year ASCVD Risk:
- Gender: Male
- Age: 42
- Race: White/Other
- Total Cholesterol: 206
- HDL-Cholesterol: 37
- Systolic Blood Pressure: 138
- Hypertension Treatment: No
- Diabetes: No
- Smoker: No

Not In Statin Benefit Group Due To 10-Year ASCVD Risk <5%

Advocate Lutheran General Hospital
SACC Evaluation

- Positive Coronary Calcium Score (132.37)
- MESA Database
  - Arterial age of 76
  - Modified risk of 30% over 10 years
    2.6% ➔ 30%
Consider when evaluating South Asian CV risk

- Traditional Risk Factor Factors
- HgBa1c
- Lp(a)
- hsCRP
- Homocystiene
- ApoB/ApoA
- Coronary Calcium Score
South Asians hold a four times greater risk for heart disease.

Clinical Evaluations
Community Outreach
Research

1.847.723.SACC (1.847.723.7222)
advocatehealth.com/luth/sacc

Find us on Facebook
Follow us on Twitter @AdvocateSACC

LIVE LIFE WITH HEART

Advocate Lutheran General Hospital