Cardiovascular Risk Factors Burden in Saudi Arabia: The Africa Middle East Cardiovascular Epidemiological (ACE) Study

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Disclosure
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• This study was sponsored by Pfizer.
BACKGROUND

• Saudi Arabia has undergone a major economic transition and experienced significant urbanization in recent years.

• This rapid urbanization was associated with a rise in the burden of cardiovascular diseases; however, the national preventive health system and screening programs have trailed behind.
BACKGROUND

• Systemic epidemiological data from the Saudi Arabia on the prevalence of recent cardiovascular risk factors is lacking

• Opportunistic screening targeted at adults at risk of developing cardiovascular disease is very limited
The aim of this analysis is to describe the current prevalence of cardiovascular risk factors among patients attending general practice clinics in Saudi Arabia.

We also compared the prevalence of risk factors between local citizens and expatriates.
Methods
ACE Study design:

- It is a cross-sectional epidemiological study
- Conducted in 98 clinics across 14 countries in the Africa and Middle East (AFME) region between July 2011 and April 2012
- The primary objective was to estimate the prevalence of cardiovascular risk factors in outpatients attending general practice and other non-specialist clinics in urban and rural communities
Subject selection

• Outpatients’ attendance older than 18 years of age
• Signing an informed consent form
• Pregnant women, lactating mothers, and outpatient with life-threatening conditions were excluded
Methods

**Sampling technique**

- Enrolling every fifth outpatient seen by a physician or general practitioner on a particular day
- Evaluations were typically undertaken over one clinic visit
- For non-fasting outpatients during the first visit, a second visit was arranged to obtain fasting blood samples
ACE-Saudi Arabia:

• In Saudi Arabia, a total of 550 outpatients were enrolled, (15% of the entire ACE study cohort)

• The study was conducted in multiple clinics in the kingdom

• In this analysis, patients were divided into two groups: Saudi Arabian Nationals (SA nationals) and expatriates
**Statistical Methods**

- Categorical data were summarized using frequencies and percentages.
- Continuous data were reported as mean ± standard deviation.
RESULTS
## Baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>Total cohort (n = 550)</th>
<th>SA Nationals (n = 194)</th>
<th>Expatriates (n = 356)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender (Male)</strong></td>
<td>391 (71%)</td>
<td>116 (59.8%)</td>
<td>275 (77.2%)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>43.2 (10.5)</td>
<td>40.8 (11)</td>
<td>44.5 (10)</td>
</tr>
<tr>
<td><strong>Age Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 – 44 years</td>
<td>301 (54.7%)</td>
<td>117 (60.3%)</td>
<td>184 (51.7%)</td>
</tr>
<tr>
<td>45 - 64 years</td>
<td>241 (43.8%)</td>
<td>75 (38.7%)</td>
<td>166 (46.6%)</td>
</tr>
<tr>
<td>≥ 65 years</td>
<td>8 (1.5%)</td>
<td>2 (1%)</td>
<td>6 (1.7%)</td>
</tr>
<tr>
<td><strong>Body Mass Index (kg/m^2)</strong></td>
<td>29.7 (5.1)</td>
<td>30.5 (5.7)</td>
<td>29.3 (4.7)</td>
</tr>
</tbody>
</table>
Prevalence of cardiovascular risk factors per patient

<table>
<thead>
<tr>
<th>Risk Factors:</th>
<th>Only one</th>
<th>Two risk factors</th>
<th>More than two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (550)</td>
<td>15.6%</td>
<td>24%</td>
<td>50.9%</td>
</tr>
<tr>
<td>SA Nationals (194)</td>
<td>17%</td>
<td>20.6%</td>
<td>48%</td>
</tr>
<tr>
<td>Expatriates (356)</td>
<td>14.9%</td>
<td>25.8%</td>
<td></td>
</tr>
</tbody>
</table>
### Modifiable CV risk factors: prevalence and distribution

<table>
<thead>
<tr>
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<th>Total cohort (n = 550)</th>
<th>SA Nationals (n = 194)</th>
<th>Expatriates (n = 356)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>41.8%</td>
<td>31.4%</td>
<td>47.5%</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>25.9%</td>
<td>23.6%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>68.6%</td>
<td>55.1%</td>
<td>75.5%</td>
</tr>
<tr>
<td>Obese (BMI ≥ 30 kg/m²)</td>
<td>45.1%</td>
<td>52.6%</td>
<td>41%</td>
</tr>
<tr>
<td>Abdominal Obesity</td>
<td>56.9%</td>
<td>65.5%</td>
<td>52.2%</td>
</tr>
<tr>
<td>Smoker</td>
<td>20%</td>
<td>21.6%</td>
<td>19.1%</td>
</tr>
</tbody>
</table>
Prevalence of newly diagnosed hypertension, DM and dyslipidemia

Risk Factors:
- SA Nationals
- Expatriates

Hypertension: 8.3% (SA Nationals) vs. 8.4% (Expatriates)
Diabetes Mellitus: 3.1% (SA Nationals) vs. 3.1% (Expatriates)
Dyslipidemia: 29.4% (SA Nationals) vs. 37.4% (Expatriates)
Eligibility of lipid lowering medication according to the AHA guidelines

- **Risk Score of ASCVD of ≥ 7.5%**
  - SA National: 18.6%
  - Expatriates: 16.9%

- **DM (age 40 - 75), LDL-C 70 - 189**
  - SA National: 10.8%
  - Expatriates: 16.6%

- **Untreated LDL-C of ≥ 190 mg/dl**
  - SA National: 0.5%
  - Expatriates: 0.3%

- **Atherosclerotic CV disease**
  - SA National: 2.6%
  - Expatriates: 4.8%
Conclusion
Conclusion

• This analysis clearly shows that there is a significant high cardiovascular risk factors prevalence in Saudi Arabia.

• With the current risk factors prevalence and control, more resources are needed for risk factor detection to avoid an epidemic in atherosclerotic cardiovascular diseases.
Conclusion

• Programmed community based screening is needed for all cardiovascular risk factors in Saudi Arabia

• Improving the primary care services may decrease the incidence of coronary artery disease and improve overall quality of life
Thanks