VDF and The Burden of Vascular Disease

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Disclosures: Boston Scientific- Consultant, RIVA medical- Stock Options
Authoritative data on incidence, prevalence, risk factors, outcomes, treatments and cost for all major CV diseases and stroke

Published yearly in Circulation, executive summary on web site and slides sets available

222 pages with >500 references

Basis of NIH and CDC stats
The Power of Numbers

- 1 in 3 Americans have Cardiovascular Disease
- On average, one death from CVD every 39 seconds
- CVD claims more lives than Cancer, Chronic Respiratory Disease and Accidents combined
“Knowledge is power.”
-Sir Francis Bacon
VDF Strategic Plan

To promote VDF as the key trusted source of health information for public, vascular disease patients, and health care professionals.

Credible, comprehensive vascular disease statistics is central to our mission
Where do you find VD Stats now?

- AHA Heart and Stroke Statistics
- Vascular Disease Foundation
- CDC
- Individual disease web sites
Key AHA PAD Stats

- 6.8-7.2 Million (5.8% of US population) with PAD in 2000. 1 in 5 over age 65 y.\textsuperscript{1,2}
- Higher prevalence in AA and worse outcome \textsuperscript{1}
- Only 10% of pts have intermittent claudication\textsuperscript{3,4}
- DM and cigarette smoking are stronger RF \textsuperscript{4}
- PAD increases mortality and CV risk \textsuperscript{2,4,5}
- Long term outcome worse with DM and poly-vascular disease (22% of symptomatic pts)

\textsuperscript{1} Allison AJPM 2007;\textsuperscript{2} Bhatt JAMA 2006, \textsuperscript{3} McDermott JAMA 2001;101:1007, \textsuperscript{4} Hirsch JAMA 2001 \textsuperscript{4} Steg JAMA 2008;297:1197, \textsuperscript{5} Diehm Circ 2009;120:2053,
Key AHA VTE stats

- The incidence is 1-2/100,000 leading to over 700,000 hospitalizations/y
- The incidence increases with age and in AA.
- PE has a 5-10% mortality at 30 days and 30% at 5y
- Approximately 30% have recurrences
- The 20 year incidence of venous stasis syndrome after DVT is approximately 40%
- Risk factors account for >75% of all VTE

Limited Information on Vascular Disease in AHA Heart and Stroke Statistics

- Stroke - 28 (of 222) pages
- Aortic Aneurysm – ½ page
- Peripheral Arterial Disease – 1 page
- DVT/PE – 1 page
VDF’s Web site is also limited!
## Incidence and Prevalence VD

<table>
<thead>
<tr>
<th>Disease</th>
<th>Incidence</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD</td>
<td>900,000/y</td>
<td>16.3 million</td>
</tr>
<tr>
<td>Stroke</td>
<td>800,000/y</td>
<td>7 million</td>
</tr>
<tr>
<td>PAD</td>
<td>≈1.8 M/y</td>
<td>≈8 million</td>
</tr>
<tr>
<td>AAA</td>
<td>≈7-14,000/y</td>
<td>≈6-8,000</td>
</tr>
<tr>
<td>VTE</td>
<td>≈700,000/y</td>
<td>≈1-3 million</td>
</tr>
</tbody>
</table>
Vascular Disease is Bad

* Estimated from incidence and mortality

Derived from AHA Heart and Stroke stats, ACS stats
## Total Burden of Vascular Disease?

### Gross approximations

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Prevalence</th>
<th>Deaths/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAD</td>
<td>( \approx 8,000,000 )</td>
<td>260,000</td>
</tr>
<tr>
<td>Stroke</td>
<td>7,000,000</td>
<td>135,000</td>
</tr>
<tr>
<td>VTE</td>
<td>( \approx 1,200,000 )</td>
<td>( \approx 1-300,000 )</td>
</tr>
<tr>
<td>AAA</td>
<td>( \approx 14-16,000 )</td>
<td>( \approx 6-8,00000 )</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>( \approx 16.2 \text{ million} )</td>
<td>( \approx 5-700,000 )</td>
</tr>
<tr>
<td>CVD</td>
<td>82 million</td>
<td>811,000</td>
</tr>
</tbody>
</table>
Challenge #1 - There are many types of Vascular Diseases

- PAD
  - Lower Extremity PAD
  - Critical Limb Ischemia
  - Renal Vascular disease
  - Buerger’s Disease
  - Diabetic foot disease
  - Mesenteric Artery disease
  - Reno-vascular disease

- Aortic Disease
  - Abdominal Aortic Aneurysm
  - Aortic Dissection
  - Thoracic Aortic Aneurysm

- Cerebrovascular disease
  - Carotid Artery Disease
  - Stroke

- Venous Disease
  - Chronic Venous Disease
  - Deep Vein Thrombosis
  - Pulmonary Embolism
  - Post-Thrombotic Syndrome
  - Varicose Veins

- Congenital Vascular Malformations
  - Fibromuscular Dysplasia
  - Lymphedema
  - Portal Hypertension
  - Raynaud’s Disease
  - Thrombophilia
  - Vasculilits
Challenge #2-Polyvascular Disease is not Uncommon

REACH Registry N=67,888

Cerebrovascular Disease

Coronary Artery Disease

Peripheral Arterial Disease

Polyvascular = 15.9%
(22% symptomatic)

Bhatt JAMA 2006
Challenge #3 - The Cause of Death in PAD is CVD in 1/3rd

<table>
<thead>
<tr>
<th></th>
<th>Total Death</th>
<th>CVD Death</th>
<th>% CVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No PAD N= 5392</td>
<td>1.95%</td>
<td>0.5%</td>
<td>25%</td>
</tr>
<tr>
<td>Asymptomatic PAD N= 832</td>
<td>4.1%</td>
<td>1.5%</td>
<td>36%</td>
</tr>
<tr>
<td>Symptomatic PAD N= 593</td>
<td>5.3%</td>
<td>1.7%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Diehm Circ 2009
Challenge #4 - Prevalence is Underestimated

- Typical Claudication – 10%
- Atypical leg symptoms - 40%
- No leg symptoms - 50%

Hirsch PARTNERS JAMA 2001
## Challenge #5 - Wide Variability in the Incidence of VTE

<table>
<thead>
<tr>
<th>Study</th>
<th>Incidence / 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worcester&lt;sup&gt;1&lt;/sup&gt;</td>
<td>115</td>
</tr>
<tr>
<td>Norwegian&lt;sup&gt;2&lt;/sup&gt;</td>
<td>143</td>
</tr>
<tr>
<td>CDC&lt;sup&gt;3&lt;/sup&gt; (hosp)</td>
<td>239</td>
</tr>
<tr>
<td>Boulet&lt;sup&gt;4&lt;/sup&gt;</td>
<td>870</td>
</tr>
<tr>
<td>Rathbun (Meta 11 trials)</td>
<td>2.5 (1.2-4.2) inpt</td>
</tr>
<tr>
<td></td>
<td>1.7 outpt</td>
</tr>
</tbody>
</table>

<sup>1</sup> Spencer JTT 2009  
<sup>2</sup> Naess JTT 2007  
<sup>3</sup> MMWR 2012  
<sup>4</sup> Boulet Arch IM 2010
What we don’t know

- The prevalence and incidence of most of the types of vascular diseases is not well defined for general population
- Most available data comes from selected populations or not from US
- Asymptomatic disease is largely unrecognized
- Total burden of vascular disease is unknown
Rationale for the Burden of VD Disease Initiative

- There is need for a comprehensive, credible source of information on all vascular diseases
- It is a core strategy that will help increase awareness for patients, families and professionals
- It will increase the visibility and credibility of VDF and will build brand
What should VD stats include?

- Prevalence
- Incidence
- Risk factors
- Awareness
- Mortality
- Morbidity
- Trends over time
- Racial and sex differences
- Treatments and outcomes
- Hospitalizations
- Costs
Next Steps

- Establish a Burden of Vascular Disease Task force with Coalition representation
- Identify Industry Partners
- Work with AHA, CDC, investigators and others to obtain the most accurate data available
- Facilitate or lead research in VD epidemiology
- Publish yearly a comprehensive Vascular Disease Statistics document
"Knowledge isn’t power until it is applied."

~ Dale Carnegie