Dementia in Africa

Adesola OGUNNIYI, FAS
Department of Medicine
University College Hospital
Ibadan, NIGERIA
E-mail: aogunniyi@com.ui.edu.ng

WCN 2019 Teaching Course 19:
Dementia: Atypical presentations of Alzheimer’s disease
Disclosure

None
Learning Objectives

• At the end of this course, attendees should:
  1. Know the range of prevalence estimates in Africa and reasons for the variations
  2. Understand the factors responsible for rising dementia prevalence in Africa
  3. Understand the Be able to describe peculiar hanging association of APOE with AD in Africa
  4. Be able to describe preventive strategies for overcoming dementia burden
Outline

• Introduction
• Epidemiology of Degenerative Dementias
• Atypical presentations in Africa
• HIV Dementia
• Preventive strategies
• Conclusion
Dementia/Major Neurocognitive Disorder

- Severe impairment in cognitive function
- The cognitive deficit is acquired and not developmental (not present at birth or shortly thereafter)
- Impairment in activities of daily living
- Need for supervision in the advanced stages
- Represents a decline from a previous level of performance
- There is no impairment of consciousness
Dementia in Africa

- Neurodegenerative causes
- Complication of HIV infection
Dementia Prevalence in Africa

27 community-based studies
• Age-adjusted prevalence: 2.29 – 21.60%

14 hospital-based studies
• Prevalence rate: 0.05 – 8.87%

Olayinka Mbuyi Int J AD 2014
## Estimates of dementia prevalence (%) in sub-Saharan Africa

<table>
<thead>
<tr>
<th>Sub-Saharan Africa</th>
<th>60-64</th>
<th>65-69</th>
<th>70-74</th>
<th>75-79</th>
<th>80-84</th>
<th>85+</th>
<th>Age-standardised prevalence for all those aged 60 years and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>All studies (n=12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.34</td>
<td>2.02</td>
<td>3.09</td>
<td>5.05</td>
<td>7.77</td>
<td>17.22</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2.43</td>
<td>3.68</td>
<td>5.66</td>
<td>9.30</td>
<td>14.35</td>
<td>32.07</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.74</td>
<td>2.64</td>
<td>4.07</td>
<td>6.71</td>
<td>10.38</td>
<td>23.31</td>
<td></td>
</tr>
<tr>
<td>DSM criteria only (n=10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.16</td>
<td>1.70</td>
<td>2.51</td>
<td>3.95</td>
<td>5.86</td>
<td>12.20</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.74</td>
<td>2.66</td>
<td>4.16</td>
<td>6.94</td>
<td>10.86</td>
<td>24.90</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.23</td>
<td>1.89</td>
<td>2.94</td>
<td>4.91</td>
<td>7.68</td>
<td>17.60</td>
<td></td>
</tr>
</tbody>
</table>

*2 studies were not included in the meta-analysis because they did not provide age- and sex- specific prevalence*
Western Figures:
AD/DLB  55%
VD     15%
Mixed  12%
PD     8%
Trauma 4%
Rare   6%

Dementia subtypes in Africa

## Proportionate Increase in number of dementia cases by world region*

<table>
<thead>
<tr>
<th>GBD Region</th>
<th>Prevalence rate (2010)</th>
<th># of cases 2010 (m)</th>
<th># of cases 2030 (m)</th>
<th>% increase 2010-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>4.7%</td>
<td>35.56</td>
<td>65.69</td>
<td>85</td>
</tr>
<tr>
<td>The Americas</td>
<td>6.5</td>
<td>7.62</td>
<td>14.78</td>
<td>89</td>
</tr>
<tr>
<td>Europe</td>
<td>6.2</td>
<td>9.95</td>
<td>13.95</td>
<td>40</td>
</tr>
<tr>
<td>Asia</td>
<td>3.9</td>
<td>15.94</td>
<td>33.04</td>
<td>107</td>
</tr>
<tr>
<td>AFRICA</td>
<td>2.6</td>
<td><strong>1.86</strong></td>
<td><strong>3.92</strong></td>
<td><strong>111</strong></td>
</tr>
<tr>
<td>North Africa</td>
<td>3.7</td>
<td>1.15</td>
<td>2.59</td>
<td>125</td>
</tr>
<tr>
<td>Central</td>
<td>1.8</td>
<td>0.07</td>
<td>0.12</td>
<td>71</td>
</tr>
<tr>
<td>East</td>
<td>2.3</td>
<td>0.36</td>
<td>0.69</td>
<td>92</td>
</tr>
<tr>
<td>Southern</td>
<td>2.1</td>
<td>0.10</td>
<td>0.17</td>
<td>70</td>
</tr>
<tr>
<td>West</td>
<td>1.2</td>
<td>0.18</td>
<td>0.35</td>
<td>94</td>
</tr>
</tbody>
</table>

*WHO 2012*
Dementia increase in Nigeria

- Pooled crude prevalence of dementia in Nigeria: 4.9% (95% confidence interval (CI) 3.0-6.9)
- Prevalence significantly higher in women (6.7%, 3.6-9.9) compared to men (3.1%, 1.2-5.0).
- Risk factors: Age 80+ (OR 1.6, 1.3-1.9), female sex (OR 2.2, 1.4-3.4) and BMI ≤18.5 (OR 3.5, 1.2-10.1)
- Using epidemiologic model, we estimated that the number of dementia cases increased by over 400% over a 20-year period, increasing from 63,512 to 318,011 (1995-2015) among persons aged ≥60 years.

Conclusion
- Our findings suggest the prevalence and cases of dementia have increased in Nigeria over the last two decades. Population-wide response to dementia is lacking.

Adeloye D et al. J Glob Health 2019 03-e2019014
Risk Factors for Dementia*

- **From field studies:**
  - Age
  - Female gender
  - Social isolation
  - Vascular Factors – Hypertension*; Diet, BMI
  - Stress, Bereavement, Personality change
  - Alcohol, Low education

- **From the Bench:**
  - APOE ε4 allele now emerging + Cholesterol
  - Others (probable)

Hypertension and Incident dementia risk

<table>
<thead>
<tr>
<th>Effect</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>1.52</td>
<td>1.01- 2.30</td>
</tr>
<tr>
<td>Systolic BP, X 10 mm Hg</td>
<td>1.09</td>
<td>1.03 – 1.16</td>
</tr>
<tr>
<td>Diastolic BP, X 10 mm Hg</td>
<td>1.22</td>
<td>1.07 – 1.38</td>
</tr>
<tr>
<td>Pulse Pressure, X 10 mm Hg</td>
<td>1.10</td>
<td>1.01 – 1.21</td>
</tr>
</tbody>
</table>
Kaplan-Meier survival estimates for time to incident AD.
Novel PS1 mutation with profound neurofibrillary pathology in an indigenous African Family

*Brain 127: 133, 2003*

J Heckmann, R Low, CM Morris, H Rao, *S Rutherfoord, C de Villiers, R Ramesar and RN Kalaria

Newcastle General Hospital, University of Newcastle upon Tyne, United Kingdom; University of Cape Town, South Africa
## Burden of HIV Neurocognitive Disorders in SSA

<table>
<thead>
<tr>
<th>Authors/Country</th>
<th>Sample size</th>
<th>HAND</th>
<th>HIV-Dem</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joska et al. SA (2019)</td>
<td>1150</td>
<td>-</td>
<td>18.2%</td>
<td>HIV Neg: 10.7%</td>
</tr>
<tr>
<td>Debalkie_Animut M. Ethiopia (2019)</td>
<td>684</td>
<td>67.1%</td>
<td></td>
<td>low BMI; Married; Advanced dis</td>
</tr>
<tr>
<td>Saktor N, Uganda (2019)</td>
<td>399</td>
<td>56%</td>
<td>13% to 5% in 2 yrs of ART</td>
<td>Clade D &gt; A; Old age, Depression, Load</td>
</tr>
<tr>
<td>Mogambery JL; SA 2017</td>
<td>146</td>
<td>53%</td>
<td></td>
<td>Age</td>
</tr>
<tr>
<td>Hakkers CS; SA 2018</td>
<td>117</td>
<td>66%</td>
<td></td>
<td>MoCA not useful</td>
</tr>
<tr>
<td>Belete T, Ethiopia 2017</td>
<td>234</td>
<td>33.3%</td>
<td>9.8%</td>
<td>Late disease stage</td>
</tr>
<tr>
<td>Tsegaw M, Ethiopia 2017</td>
<td>-</td>
<td>36.4%</td>
<td></td>
<td>Low CD4; Age, educ, Poor adherence</td>
</tr>
<tr>
<td>Yusuf AJ; Nigeria 2017</td>
<td>418</td>
<td>21.5%</td>
<td></td>
<td>9.6% asymptomatic; duration, severity</td>
</tr>
<tr>
<td>Kelly CM 2014; Malawi</td>
<td>106</td>
<td>15%</td>
<td>3%</td>
<td>55% asymptomatic</td>
</tr>
<tr>
<td>Habib AG 2013 – syst review of 16 studies/7 countries</td>
<td>-</td>
<td>42.4%</td>
<td></td>
<td>Dropped to 30.4% in 6 months of ART</td>
</tr>
</tbody>
</table>
Cognitive Stimulation Therapy (CST) for dementia

• Psychological and social treatment.
• Group based
• Aims to improve function and slow deterioration.
• 14 sessions over 7 weeks
• Can be delivered by non specialist staff after training.
Figure 5: Potential brain mechanisms for preventive strategies in dementia
Justification for Dementia Studies in Africa

- Demographic transition
- Changing life styles
- Opportunity for identification of novel risk factors that may be environmental
- Investigation of gene-environmental interactions
- Opportunity to improve awareness and offer cost-effective management
Key Message

• Africa currently has the lowest burden of dementia
• Prevalence estimates range between 2.3% and 11%
• Between 200 and 400% increase is projected to occur in the next 30 years
• Alzheimer’s disease is the most common type as in the rest of the world; atypical cases do occur
• Vascular risk factors are of important consideration
• Cost of care is enormous
• Focus should be on implementing preventive strategies


3. Alzheimer Disease International. Dementia in sub-Saharan Africa. ADI 2017


7. Adeloye D et al. Dementia prevalence in Nigeria. *J Glob Health* 2019 03-e2019014


Acknowledgements

National Institute of Aging, NIH
Indianapolis-Ibadan Study Group
Grand Challenges Canada
IDEA Study Group
Newcastle University
Northumbria HC Trust, UK
Kilimanjaro Christian Medical College, Moshi
Alzheimer Disease International
Prof. Raj Kalaria

GCC 0086-04#
RO1 AG09956