HEPATITIS C THERAPEUTIC OPTIONS IN AFRICA

Olufunmilayo Lesi, MD, FWACP, FMCP

College of Medicine, University of Lagos, & Lagos University Teaching Hospital. Nigeria

BEST OF EASL- Africa
October 1, 2016
Addis Ababa, ETHIOPIA, 2016
OUTLINE- SOME QUESTIONS

1. Is HCV a public health threat in SSA
2. Who do we screen?
3. HCV treatment in Nigeria
4. Challenges to expanding therapeutic access in SSA
INTRODUCTION

• HCV is the most common chronic blood borne infection in the USA affecting at least 3 million Americans

• It is the leading cause of end-stage liver disease and liver transplantation.

• Availability of highly effective, yet highly costly curative therapy for HCV has converted hepatitis care into an emergency requiring urgent responses including an urgency to increase awareness and screening

• WHO elimination goals for 2030
PREVALENCE
170 MILLION PEOPLE

Estimates are derived from a meta-analysis of data from 232 studies published between 1997 and 2007 and NHANES data up to 2010. Point prevalence estimates are calculated using regional population age weights.
SUB-SAHARAN AFRICA: REGIONAL CHARACTERISTICS & VIRAL HEPATITIS CONTROL

- Population, total 960.1 million 2014
- Low income economies-60%
  - GNI per capita, Atlas method 2013 ($1,657)
- Urban population 37% (2014)
- Chronic HBV & HCV endemic - Significant public health & economic impact. Estimated 18 million cases of cirrhosis/HCC within next 20 yrs

World Bank, 2015
CHRONIC HCV IN AFRICA - 19 MILLION INFECTIONS - NEARLY 11% OF GLOBAL INFECTIONS

HCV seroprevalence 1.0-14%
- differential historical exposure to iatrogenic transmission

SSA: Highest prevalence
- Cameroon 4.9%,
- Burkina Faso 6.1%
- Gabon 4.9%

SSA: Largest absolute number
- Nigeria - 3.1% (2.5 million persons)
- Ethiopia - 2.7% (1.26 million persons)

Riou M et al, HCV seroprevalence in Africa; JVH, August 2015
CHRONIC HCV IN AFRICA- 19 MILLION INFECTIONS- NEARLY 11% OF GLOBAL INFECTIONS

In Egypt

• Estimated prevalence is 14.7% affecting an estimated 6.8 million

In Africa

Highest prevalence

• Middle Africa (Cameroon)
• West Africa (Burkina Faso, Gabon, Benin)

<table>
<thead>
<tr>
<th>Central /West Africa Country</th>
<th>Estimated adult seroprevalence (%)</th>
<th>Estimated number of adult carriers (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>3.9</td>
<td>370</td>
</tr>
<tr>
<td>Burundi</td>
<td>3.1</td>
<td>150</td>
</tr>
<tr>
<td>Cameroon</td>
<td>4.9</td>
<td>525</td>
</tr>
<tr>
<td>Burkina faso</td>
<td>6.1</td>
<td>475</td>
</tr>
<tr>
<td>DRC</td>
<td>2.1</td>
<td>647</td>
</tr>
<tr>
<td>Ghana</td>
<td>3.2</td>
<td>426</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2.7</td>
<td>1206</td>
</tr>
<tr>
<td>Congo republic</td>
<td>2.9</td>
<td>224</td>
</tr>
<tr>
<td>Rwanda</td>
<td>3.1</td>
<td>175</td>
</tr>
<tr>
<td>Nigeria</td>
<td>3.1</td>
<td>2575</td>
</tr>
</tbody>
</table>
# POOLED HCV SEROPREVALENCE - SSA

<table>
<thead>
<tr>
<th>Risk</th>
<th>Prevalence</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk cohorts</td>
<td>2.7%</td>
<td></td>
</tr>
<tr>
<td>Antenatal clinics</td>
<td>3%</td>
<td>2.2-3.8</td>
</tr>
<tr>
<td>Blood donors</td>
<td>2%</td>
<td>1.9-2.1</td>
</tr>
<tr>
<td>HIV positive</td>
<td>5.7%</td>
<td>4.9-6.6</td>
</tr>
</tbody>
</table>

![Graph showing prevalence of HCV and HIV](graph.png)

Roa VB, et al. Lancet infectious diseases 2015; 15; 819 to 824
Overlapping Epidemics of HBV, HCV and HIV

Viral hepatitis has become one of the most clinically important co-morbidity among people living with HIV. (co-infection with HBV and HCV occur in 15% and 7%
THE ROAD TO THERAPEUTIC OPTIONS AND CURE FOR HCV INFECTION BEGINS WITH SCREENING
RISK FACTORS FOR VIRAL HEPATITIS-HCV

- Iatrogenic transmission
- Egypt: parenteral anti-schistosomal mass treatment in the 1960s and 1970s
- Mass treatment campaigns against yaws, malaria, syphilis in Cameroon, Gabon, CAR and DRC

Pepin j et al, clin Infectious diseases 2010
Njouom R et al, J gen viro. 2009
Ndong-Atome Gr et al, J med virol. 2008
UNSAFE INFECTIONS

Unsafe medical practices and injection safety- as in Egypt and Cameroon- Implications for aggressive & targetted screening

Traditional practices including scarifications, tattoos
WHO TO SCREEN: WESTERN COUNTRIES

3 approaches

- Population screening, including antenatal
- Risk-factor based screening e.g., PWID, MSM, prisoners
- Birth cohort screening

- No current universal screening program
- Risk based screening: population dependent
- Birth cohort - in USA and Japan, ??? Sub-Saharan Africa
WHO TO SCREEN ?: SUB-SAHARAN AFRICA

Remains unclear

• Persons with persistently abnormal ALT levels.
• Recipients of transfusions (prior) to ???
• Persons with recognized occupational exposures e.g. HCWs
• Exposure to unsafe injection or medical practices
• Children born to HCV-positive women
• HIV positive persons
• ? Traditional practices
• Persons who ever injected illegal drugs
## Therapeutic Options: Awareness, Screening, Testing

<table>
<thead>
<tr>
<th>Barrier</th>
<th>What we need to do to access therapy and promote treatment scale-up</th>
</tr>
</thead>
</table>
| Lack of awareness                                                      | Increase awareness of population /Health care worker /political  
  • Information, education, research, advocacy, civil society mobilization |
| Screening with anti- HCV serological tests                             | Access to testing  
  • rural and urban population  
  • Integration into existing facilities |
| NAT for HCV RNA needed for confirmation of viraemia                     | Health system strengthening  
  • Prequalified screening tests  
  • Laboratory facilities for viral load and genotype |
|                                                                        | Newer testing strategies –eg HCV Ag test  
  GeneXpert HCV |
BACKGROUND: NIGERIA, WEST AFRICA

Population: 180 million
GDP per capita $1,657
60% live below poverty line
average HBsAg prevalence of 13.7% and anti-HCV prevalence of <2%
20 million persons currently infected with hepatitis B.
2.5 million persons with HCV
SOGHIN
SOCIETY FOR GASTROENTEROLOGY AND HEPATOLOGY IN NIGERIA

Best of EASL, Lagos, Nigeria, July 2016
WHD 2016: community awareness and screening in 750 subjects (community 500 and Health Sciences students-150

Have you ever heard of viral hepatitis B or C?

Do you know your HIV status?
Do you know your Hepatitis B or C status?
HCV REGISTRY PILOT-
REAL WORLD DATA- NIGERIA 2016

- Commenced July 2015 with availability of generic Sofosbuvir in the Nigerian market
- Over 300 persons treated with sofosbuvir containing regimen to date
- Gastroenterologists/ hepatologists/ National GI professional society -
- 8 recruiting collaborators/sites to date
### THE NIGERIAN HCV REGISTRY - PRELIMINARY REAL WORLD DATA - 2016

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N=80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age, y (range)</td>
<td>59 (40-60)</td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>43 (52%)</td>
</tr>
<tr>
<td>Risk factor</td>
<td></td>
</tr>
<tr>
<td>Prior surgery/instrumentation</td>
<td>19 (15%)</td>
</tr>
<tr>
<td>Prior Blood transfusion</td>
<td>12 (9.4%)</td>
</tr>
<tr>
<td>HIV infection/IVDU/MSM</td>
<td>0</td>
</tr>
<tr>
<td>Genotype 1</td>
<td>62 (78%)</td>
</tr>
<tr>
<td>Genotype 2</td>
<td>10 (12.5%)</td>
</tr>
<tr>
<td>Genotype 3</td>
<td>2</td>
</tr>
<tr>
<td>Genotype 4</td>
<td>8 (10%)</td>
</tr>
<tr>
<td>No cirrhosis</td>
<td>48</td>
</tr>
<tr>
<td>Cirrhosis compensated</td>
<td>17</td>
</tr>
<tr>
<td>Cirrhosis decompensated (child Pugh) score</td>
<td>10</td>
</tr>
<tr>
<td>Regimen type</td>
<td></td>
</tr>
<tr>
<td>Sof/Peg +/-RIBA</td>
<td>65</td>
</tr>
<tr>
<td>Sof/Led or Sof/Daclatasvir</td>
<td>10</td>
</tr>
</tbody>
</table>
LESSONS LEARNT FROM REGISTRY PILOT

1. “African Birth Cohort’ effect
2. Significant history of exposure to blood transfusion, health care or hospital admission/surgical intervention etc
   1. Iatrogenic transmission, unsafe injection, blood safety,
3. HCV screening driven by clinical features of liver disease or abnormal liver function tests
4. Predominant HCV genotype 1
5. High cost of care-exceeding 4000 USD
   consultation, HCV viral load ± genotype, liver enzyme, fibroscan etc)
   high end private health care, specialist liver care model. Mostly out-of-pocket expenses
6. Predominant use of Sof/Peg/Riba (availability)-generic
   sofosbuvir and Increasing availability/ use of Ledipasvir & Daclatasvir combinations (generic)
7. Limitations
<table>
<thead>
<tr>
<th>Product</th>
<th>Presentation</th>
<th>Posology</th>
</tr>
</thead>
<tbody>
<tr>
<td>PegIFN-α2a</td>
<td>Solution for injection containing 180, 135 or 90μg of PegIFN-α2a</td>
<td>Once weekly subcutaneous injection of 180μg (or less if dose reduction needed)</td>
</tr>
<tr>
<td>PegIFN-α2b</td>
<td>Solution for injection containing 50 μg per 0.5 ml of PegIFN-α2b</td>
<td>Once weekly subcutaneous injection of 1.5 μg/kg (or less if dose reduction needed)</td>
</tr>
<tr>
<td>Ribavirin</td>
<td>Capsules containing 200 mg of ribavirin</td>
<td>Two capsules in the morning and 3 in the evening if body weight &lt;75 kg Or Three capsules in the morning and 3 in the evening if body weight ≥75 kg</td>
</tr>
<tr>
<td>Sofosbuvir</td>
<td>Tablets containing 400 mg of sofosbuvir</td>
<td>One tablet once daily (morning)</td>
</tr>
<tr>
<td>Simeprevir</td>
<td>Capsules containing 150 mg of simeprevir</td>
<td>One capsule once daily (morning)</td>
</tr>
<tr>
<td>Daclatasvir</td>
<td>Tablets containing 30 or 60 mg of daclatasvir</td>
<td>One tablet once daily (morning)</td>
</tr>
<tr>
<td>Ledipasvir/Sofosbuvir</td>
<td>Tablets containing 400 mg of sofosbuvir and 90 mg of ledipasvir</td>
<td>One tablet once daily (morning)</td>
</tr>
<tr>
<td>Paritaprevir/ombitasvir/ritonavir</td>
<td>Tablets containing 75 mg of paritaprevir, 12.5 mg of ombitasvir and 50 mg of ritonavir</td>
<td>Two tablets once daily (morning)</td>
</tr>
<tr>
<td>Dasabuvir</td>
<td>Tablets containing 250 mg of dasabuvir</td>
<td>One tablet twice daily (morning and evening)</td>
</tr>
</tbody>
</table>
TREATMENT GUIDELINES

INTERNATIONAL GUIDELINES VS LOCAL PRACTICE
**Therapeutic options: Financing access to care and drug therapy**

**DIRECT COSTS OF TESTS & DRUGS**

<table>
<thead>
<tr>
<th>Test / Drug</th>
<th>Cost (US $)</th>
<th>Government subsidy/insurance reimbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV/HCV serology (5 markers)</td>
<td>30</td>
<td>Nil</td>
</tr>
<tr>
<td>Biochemistry/ liver enzymes (panel)</td>
<td>40-50</td>
<td>Nil</td>
</tr>
<tr>
<td>Ultrasound scan CT scan</td>
<td>30-50</td>
<td>NIL</td>
</tr>
<tr>
<td>Ultrasound scan CT scan</td>
<td>200</td>
<td>NIL</td>
</tr>
<tr>
<td>HBV DNA Viral load HCV RNA Viral load</td>
<td>240-450</td>
<td>NIL</td>
</tr>
<tr>
<td>HBV DNA Viral load HCV RNA Viral load</td>
<td>240-450</td>
<td>NIL</td>
</tr>
<tr>
<td>Pegylated interferon (monthly)</td>
<td>800-950</td>
<td>NIL</td>
</tr>
<tr>
<td>Sof/ledipasvir (Generic)</td>
<td>25-50</td>
<td>NIL</td>
</tr>
<tr>
<td>Sof/Dacatasvir</td>
<td></td>
<td>NIL</td>
</tr>
</tbody>
</table>

The availability of oral DAA have revolutionized the treatment of HCV with cure rates over 90% even in HIV co-infected subjects.

Current costs of sofosbuvir, Per person (12 weeks)
KEY CHALLENGES CONFRONTING SSA COUNTRIES THE FIVE “LACKS”

- Information gaps on disease and economic burden, treatment need, and potential impact of treatment scale-up (to build investment case)
- Not enough advocacy, leadership and commitment for hepatitis response at higher levels
- Continued limited global and country funding
- Lack of national strategies and plans and dedicated hepatitis department/focal person within MOH in many countries
- Public health sector approach to hepatitis treatment still in its infancy and Lack of case finding (testing approaches)
- High cost of DAA drugs for HCV
ENHANCING THERAPEUTIC OPTIONS

Appropriate model of care to improve access

- Individualized or public health approach
- Vertical system (like HIV) vs integrative into existing program
- Lessons learnt: Public health approach successful in the control of HIV in Africa and likely to succeed in Hepatitis, Lessons from Egypt

Estimated numbers of people receiving antiretroviral therapy globally and by WHO Region and percentage coverage globally, 2000–2015
ENHANCING THERAPEUTIC OPTIONS

Health care financing

- Increased government budget
- Shared costs with other strategies
- Innovations and increased efficiencies

Drug access and funding in RLS

- Generic versions of DAA
- Tiered Pricing
- Government funding/Donor funding
- Treatment subsidization as available for HIV/AIDS, malaria and TB through international donors (Global Funds, PEPFAR, AU, others)
SUMMARY

• Significant disease burden

• Availability of curative therapy for HCV has converted hepatitis care into an emergency requiring urgent responses.

• Despite the therapeutic options, challenge of data hampers disease awareness and recognition. Provision of screening and testing and care needed within an integrated public health system

• There is need for a 360 degree response including government commitment and collaboration, strengthening African networks and collaborations, international collaborations (donors, pharmaceuticals) health insurance and HMOs, civil society, academia.
THANK YOU

Acknowledgements: Hepatitis B Registry team, SOGHIN
THANK YOU FOR YOUR ATTENTION