Routine viral load (VL) monitoring for targeted adherence support among antiretroviral therapy (ART) patients in a resource-limited setting, Swaziland

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1. Swaziland National AIDS Program, MoH
2. Médecins Sans Frontières, Swaziland
3. Clinton Health Access Initiative, Swaziland
Introduction

- Swaziland (popula 1.1 m)
- Adult (18-49yrs) HIV prevalence of 31% (SHIMS 2012)
- ~90,000 clients on ART (Mar 2013)
- >80% retention at 24months
- 4-6 monthly routine CD4 monitoring (currently)
Introduction II

- In May 2012, the Swaziland National AIDS Programme, in partnership with Medecins sans Frontieres, (MSF) began implementation of Routine Viral Load (VL) monitoring in Shiselweni region.

- Generic laboratory-based VL platform (Biocentric), at regional lab level.

- With detectability threshold at 100 copies/ml
Introduction III

• **Eligibility for routine VL monitoring:** on ART for at least 6 months.

• Patients with detectable VL then receive **enhanced adherence interventions** consisting of:
  
  • Baseline adherence and clinical assessment by nurse (with treatment of Opportunistic Infections)
  
  • 1-monthly drug pick-ups (from 3monthly pick-up)
  
  • **Stepped-up adherence counselling** (x 3 sessions)
    – solution-focused counselling intervention,
    – provided by lay counsellors (Expert Clients),
    – each counselling session lasting 30-45 minutes.
Rational

Routine VL monitoring enhances **timely detection** of treatment failure, & can help identify patients with **adherence problems**, thus permitting **adherence interventions** to prevent acquired resistance.
Objectives

- To identify determinants of detectable VL
- To define high-risk groups that may benefit from stepped-up adherence support
- To make recommendations for programming
Methodology 1

• Operational Research
• Involving 23 clinics and 2 health centres in 3 health zones of Shiselweni region, Swaziland
• Study period – May 2012 – March 2013
• Study subjects – all HIV+ clients on ART for =>6 months and have 1st VL test done
• Outcome measure – viral detectability following ART for =>6 months
Methodology 2

• We analysed lab records of 7689 patients who received 1st routine VL test during study period.

• Among these, 2089 were linked electronically with the national ART database using unique patient ID.

• Descriptive analysis and multivariable logistic regression were used to explore the relationship between VL and gender, age, time on ART, recent CD4 count & WHO stage.

• Statistical analysis were performed using Stata/SE (StataCorp, Texas, U.S.A.) Version 12.1.
Lab and staff
Description of the population

- 7689 patients
- 4979 (65%) female
- Median age 38 years (IQR 30 – 48)
- Median time since ART initiation 3 years and 5 months (IQR 2–5 years)
Findings
Viral detectability among study cohort

1098 (14%) patients had a detectable VL.
## Viral detectability by sex

<table>
<thead>
<tr>
<th></th>
<th>Undetectable (N, %)</th>
<th>Detectable (N, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2290 (84.5%)</td>
<td>420 (15.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>4301 (86.4%)</td>
<td>678 (13.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>65921 (85.7%)</td>
<td>1098 (14.3%)</td>
</tr>
</tbody>
</table>

Although small, we noted a significantly higher rate of detectability in men (p 0.023)
Viral detectability by age

Proportion with detectable VL was higher among children/adolescents (28.7% in patients aged $\leq$20yrs, compared to 12.6% in those aged $>20$, $p<0.001$).
Viral detectability by most recent CD4 count

<table>
<thead>
<tr>
<th>CD4 Range</th>
<th>Undetectable</th>
<th>Detectable</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200</td>
<td>32%</td>
<td>17%</td>
</tr>
<tr>
<td>200-349</td>
<td>19%</td>
<td>17%</td>
</tr>
<tr>
<td>350-499</td>
<td>14%</td>
<td>17%</td>
</tr>
<tr>
<td>500+</td>
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Patients with lower CD4 were more likely to have detectable VL, p < 0.001
Viral detectability by most recent WHO staging

Patients on WHO stages III/IV were more likely to have detectable VL, \( p=0.001 \)
## Viral detectability & time on ART

<table>
<thead>
<tr>
<th>Time on ART</th>
<th>Undetectable (N, %)</th>
<th>Detectable (N, %)</th>
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<tbody>
<tr>
<td>Median</td>
<td>3.4 yrs</td>
<td>3.4 yrs</td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>(2 yrs – 5.2 yrs)</td>
<td>(2 yrs – 5 yrs)</td>
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Among 200 “detectable patients” who had repeat VL test, 95 (47.5%) became undetectable following stepped-up adherence counseling (**re-suppression**).

- Level of **re-suppression** was significantly less among patients <=20 years old than those >20 years old (p=0.001).
- 41% of men vs 49% of women got re-suppressed (p=0.223)

**Viral re-suppression by age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Undetectable VL</th>
<th>Detectable VL (&gt;100 copies/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>26%</td>
<td>74%</td>
</tr>
<tr>
<td>over 20</td>
<td>54%</td>
<td>46%</td>
</tr>
</tbody>
</table>
Conclusions 1

• Routine VL monitoring can be beneficial in resource-constrained settings—to identify those who may benefit from targeted adherence interventions.

• Children and adolescents are more likely to have detectable VL, and are less likely to re-suppress following stepped-up adherence interventions.

• Men are more likely than women to have detectable VL, and are less likely to re-suppress following adherence interventions.
Conclusions 2

• These groups could benefit from routine, early and more frequent VL monitoring, to detect adherence problems early; with tailored interventions to improve adherence and achieve viral re-suppression.
Study Limitations

• An operational research – not RCT design
• Utilising laboratory-based data mainly
• Did not control for some baseline patient characteristics, e.g. CD4 count at initiation
• Adherence counselling interventions provided mainly by lay counsellors with limited skills
Acknowledgements

• Médecins Sans Frontières

• Swaziland National AIDS Programme

• Regional Health Management Team of Shiselweni

• The health care workers of Shiselweni

• Our patients
THANK YOU