Measuring adherence to antiretroviral therapy among HIV positive youth, Uganda

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Outline

• Background
• Adherence problems among adolescents
• The role economic strengthening in adherence to ART
• Measuring adherence to antiretroviral therapy
• The Suubi+ Adherence study
  • Preliminary findings
• Conclusion
• Acknowledgement
Background

• Sub-Saharan Africa (SSA) remains the most heavily affected region by HIV/AIDS, contributing about 67% of the global 35.3 million infected cases, and 70% of the 2.3 million global annual new infections (UNAIDS 2013).

• 7.2 percent of Uganda’s population was living with HIV. (UNAIDS 2013), of which 100,000 were children under 15 years.

• Despite the availability and proven efficacy of HIV care, many children living with HIV do not access HIV care (IRIN/PlusNews).

• Among those who access, non-adherence to treatment is still a problem.

• Strict adherence to antiretroviral therapy (ART) is key to sustained HIV suppression, reduced risk of drug resistance, improved overall health, quality of life, and survival, as well as decreased risk of HIV transmission (Chesney MA, 2006, WHO)

• Poor adherence is a major cause of therapeutic failure & loss of virologic control and may lead to emergence of drug resistance and loss of future treatment options
Adherence problems among adolescents

- HIV-infected adolescents are especially vulnerable to adherence problems resulting from their psychosocial and cognitive developmental trajectory. (AIDSinfo 2016)

- Compared with adults, youth have lower rates of viral suppression and higher rates of virologic rebound and loss to follow up (Hosek SG, 2005)

- Inability of the children or their caretakers to meet costs associated with utilization of HIV care and treatment services has been identified as a major barrier (Nakigozi, 2013; Hudelson & Cluver 2015)
  - commonly cited reasons for nonadherence are economic in nature, such as lack of resources for medication, transportation to attend follow-up clinic appointments, and food and nutritional supplements
The role of economic strengthening in adherence to ART

• Poor children are less likely to adhere to ART and other health-related regimens compared to children who are more economically stable.

• In Uganda, HIV+ adolescents are affected by parental HIV, orphan hood, poverty, and discrimination

• Poverty has been identified as a barrier to ART adherence in low resource settings. Specifically, in SSA, individual and family-level poverty—manifesting as lack of assets, monetary income, and material resources
  • Highlighting the importance of economic strengthening, to achieve good adherence to HIV treatment

• Unfortunately, adherence interventions have not focused on the underlying economic drivers of non-adherence to ART among HIV+ adolescents
Measuring Adherence to antiretroviral therapy

• Measuring Adherence in Research Studies
  • Clinical studies employ a number of methods, alone or in combination, to measure medication adherence. This reflects the fact that there is no gold standard by which to measure adherence measures used in research, although impractical for most clinical settings, are more sensitive than patient self-report for detecting medication nonadherence

• Adherence measurements include:
  • MEMS Caps: The MEMS caps measure utilizes a computer chip embedded in a specially designed pill-bottle cap to record the time and duration of each bottle opening.
  • Pill Counts
    Pill counts can be conducted in clinic or at unannounced home visits. Pill count adherence is usually calculated by counting the remaining doses of medication and assuming that remaining pills in excess of what is expected represent missed doses
  • Biological Markers
    Biological markers of adherence refer primarily to plasma concentrations of antiretroviral drugs.
  • Pharmacy Refill Data
    Pharmacy refill data can serve as an adherence measure by providing the dates on which antiretroviral medications were dispensed
The Suubi+ adherence study

• An evaluation of a youth-focused economic empowerment approach to HIV treatment adherence

• Suubi+ Adherence is the first study to integrate and test economic empowerment and stability-focused interventions in relation to antiretroviral therapy adherence for HIV-infected adolescents in Uganda

• Target population: HIV+ adolescents enrolled in care, ages 10-16; on ART, living within a family

• aims to:
  • 1) promote income-generating activities—also known as microenterprises—for poor HIV-infected adolescents and their families so that there is sufficient income to meet the specific needs associated with managing HIV as a chronic illness
  • 2) provide support for adherence to antiretroviral therapy (ART).

**To examine the impact of the Suubi+ Adherence intervention on key adherence to HIV treatment regimen outcomes for HIV+ adolescents**
Adherence assessment and biomarkers in the Suubi adherence study

**ART adherence is assessed using:**
- *Wisepill*, an electronic monitoring system (similar to MEMS caps)
- Self-report
- Pill counts

**Viral load monitoring**
- Used to monitor response to antiretroviral therapy
- Participant plasma viral load tested using the Abbott real time HIV-1 (M2000rt) platform annually.
Preliminary findings

Baseline characteristics of participants
- A total of 702 participants gave blood for Viral load testing
- Participants were comparable in regard to age, gender and baseline viral load

Follow up
- 37 (5%) participants (19 in the control and 18 in the treatment arm) had no wave 2 viral load
- A significantly higher proportion in the control arm, that had virologic suppression remained suppressed at wave 2 visit. (below detectable at both visits)
- Among participants who had detectable viral load at baseline, a significantly higher proportion had achieved viral suppression by wave 2 among the treatment arm compared to the control arm

Change in viral load by study arm

<table>
<thead>
<tr>
<th>Change in viral load</th>
<th>Control (N=325)</th>
<th>Treatment (N=340)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remained below detectable</td>
<td>181 (55.7)</td>
<td>162 (47.7)</td>
<td>0.038</td>
</tr>
<tr>
<td>Changed from detectable to below detectable</td>
<td>30 (9.2)</td>
<td>52 (15.3)</td>
<td>0.017</td>
</tr>
<tr>
<td>Became detectable</td>
<td>23 (7.1)</td>
<td>31 (9.1)</td>
<td>0.335</td>
</tr>
<tr>
<td>Remained detectable</td>
<td>91 (28.0)</td>
<td>95 (27.9)</td>
<td>0.987</td>
</tr>
</tbody>
</table>
Conclusion

Economic strengthening may potentially improve adherence hence virological response to antiretroviral therapy among adolescent
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