Food by Prescription: Impact of food supplements on nutritional recovery of malnourished HIV infected clients

Nutrition and HIV Program

Implementers Meeting August 2010, Nairobi
In July 2011, FHI 360 acquired the programs, expertise and assets of AED.
• This presentation will cover…

• Reflections on significance malnutrition in management of HIV infected;
• Treatment options and rationale for feeding regimens;
• Experiences from operations research and in service delivery;
• Conclusions and opportunities for the future
Pathophysiology of malnutrition in HIV infection

- Modified metabolism – increased resting energy expenditure, increased protein degradation, peripheral lipolysis (re-cycling fatty acids), impaired organ function
- Inadequate food intake – food insecurity, anorexia, pain, physical impairment, neurological impairment
- Gastrointestinal disorders - Impaired digestion, malabsorption and intestinal permeability/gut loss.
- Reduced physical activity (due to constitutional symptoms) - disuse atrophy.
- Interference with androgenic hormone production.
Treatment Options – Adjunct to HAART

• Nutritional – Nutrient dense supplemental and therapeutic foods + anti-oxidant micronutrients (vitamins and minerals)
• Resistance exercises – progressive resistance exercise training
• Hormone therapy – Anabolic compounds
• Cytokine – Blockers (TNF-α)

Most Feasible ➤ Nutritional + resistance exercise
Aim of nutrition treatment in PLHIV

- Improve Quality of Life;
  - Restore function
  - Reduce morbidity
  - Slow disease progression
  - Reduce stigma

- Improve adherence to medications (ARVs) & lower drug toxicity

- Reduce mortality
Supplemental and Therapeutic Feeding Regimens

- Fortified Blended Food – Pre-cooked flour
  - Energy dense foods: Whole grain cereal flour + Fat
  - Essential amino-acid + Non-EAA: Soya ~ L-glutamine, L-arginine
  - Multiple micronutrients (MM): Anti-oxidants - Se, Zn, Vit E,C;

- Ready to Use Therapeutic Food (RUTF)
  - Spreads: Peanuts-lipid paste + Milk powder + MM + Sugar

- Combination of FBF + RUTF
Food Products

FBF

RUTF
### Effectiveness of FBP in treatment of malnutrition in PLHIV

<table>
<thead>
<tr>
<th>Study Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ndeka MJ et al 2009; Malawi</td>
<td>Patients with BMI &lt; 18.5 starting ART Supplemented with energy dense peanut-lipid based spread vs corn-soy blend for 14wks; Rapid wt gain in 1st 2 wks. BMI increase 2.2 ± 1.9 vs 1.7 ± 1.6; No obvious effects on mortality at 3.5 mo (26% vs 27%)</td>
</tr>
<tr>
<td>Muttunga JN et al 2010; Kenya (FANTA/KEMRI)</td>
<td>FBF supplement + nutrition counseling vs nutrition counseling alone on malnourished adult patients starting ART &amp; pre-ART. Wt gain 1.9 &amp; 1.0 kg in 1st mo and 4.6 &amp; 3.4 kg by 3rd mo on food &amp; non-food respectively</td>
</tr>
</tbody>
</table>
Evidence? FBF vs. No Food for HIV+ Adults: Results: $\Delta$BMI (ART)

- Differences significant through the 3rd month.
- Food significant determinant of $\Delta$BMI at 3 months in multivariate regression but not 6.
- Greater difference for women than men.
- Rapid weight gain: 1.9 & 1.0 kg in 1st month and 4.6 & 3.4 kg. by 3rd month on food & non-food respectively.

*FANTA & KEMRI, 2010*
Evidence?; FBF vs. No Food for HIV+ Adults: Results: $\Delta$BMI (pre-ART)

- Differences significant through the 6th month.
- Food significant determinant of $\Delta$BMI at 3 and 6 months in multivariate regression.
- Greater difference for women than men.
- After 6 months differences not significant (n quite low by then).
Experiences from NHP

- Sub-sample of data drawn from 292 primary and satellite sites during the period January – June, 2010
- Clients with 2 consistent follow-up visits after baseline were selected
- Estimated changes in weight and BMI
Profiles of clients enrolled Jan-June 2010 (n=17,065)

- **Gender distribution** Male=33.3%, Female=66.1%
- **Mean Age:**
  - Male=39.84 (SD=12.75), Female=35.84 (SD=21.61)
- **ART Status:** Pre – ART = 48.4%, ART = 51.6%
- **Mean Overall Treatment time:** 62.7 days
- **Clients on TB treatment:** 16.1% (72% reporting)
## BMI Profile of beneficiaries

<table>
<thead>
<tr>
<th>BMI Category (kg/m²)</th>
<th>Pre ART</th>
<th></th>
<th>ART</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>&lt; 16</td>
<td>1918</td>
<td>27.5</td>
<td>1535</td>
<td>21.7</td>
</tr>
<tr>
<td>16 - 17</td>
<td>1398</td>
<td>20.0</td>
<td>1275</td>
<td>18.1</td>
</tr>
<tr>
<td>17 - 18.5</td>
<td>2500</td>
<td>35.8</td>
<td>2694</td>
<td>38.2</td>
</tr>
<tr>
<td>18.5 – 21.9</td>
<td>1158</td>
<td>16.6</td>
<td>1557</td>
<td>22.1</td>
</tr>
<tr>
<td>Total</td>
<td>6974</td>
<td>100.0</td>
<td>7061</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*p<0.005 between Pre-ART and ART groups*
Mean weight and BMI changes for a sample of clients

<table>
<thead>
<tr>
<th>Category</th>
<th>Indicator</th>
<th>Response</th>
<th>% Clients</th>
<th>Mean</th>
<th>(IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-ART</td>
<td>Weight (n=358)</td>
<td>Gain</td>
<td>76.8</td>
<td>3.7</td>
<td>(1.5,5.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss</td>
<td>23.2</td>
<td>-3.0</td>
<td>(-4.0,-1.0)</td>
</tr>
<tr>
<td></td>
<td>BMI (n=546)</td>
<td>Gain</td>
<td>73.1</td>
<td>1.09</td>
<td>(1.23,1.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss</td>
<td>26.9</td>
<td>-1.04</td>
<td>(-1.4,-0.4)</td>
</tr>
<tr>
<td>ART</td>
<td>Weight (n=937)</td>
<td>Gain</td>
<td>73.2</td>
<td>3.7</td>
<td>(1.4,5.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss</td>
<td>26.8</td>
<td>-2.93</td>
<td>(-4.0,-1.0)</td>
</tr>
<tr>
<td></td>
<td>BMI (n=1452)</td>
<td>Gain</td>
<td>72.6</td>
<td>1.1</td>
<td>(0.3,1.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss</td>
<td>27.4</td>
<td>-1.15</td>
<td>(-1.5,-0.4)</td>
</tr>
</tbody>
</table>

Age: Comparable to the cohort; Nutrition profile: similar to the cohort
Percentage weight change among clients

<table>
<thead>
<tr>
<th>% weight change</th>
<th>Pre ART</th>
<th></th>
<th>ART</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>&lt; 10%</td>
<td>280</td>
<td>78.2</td>
<td>746</td>
<td>79.7</td>
</tr>
<tr>
<td>&gt; 10%</td>
<td>78</td>
<td>21.8</td>
<td>190</td>
<td>20.3</td>
</tr>
<tr>
<td>Total</td>
<td>358</td>
<td>100.0</td>
<td>936</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Conclusions

• The NHP findings are similar to those reported in the Kenyan OR study;

• The reported weight gains did not attain the 10% threshold (~ assumed nutrition reconstitution threshold); Longer supplementation period/improved adherence required.

• Strengthening nutrition education and counseling, improve client follow-up mechanisms and data quality assurance
Future 1: Fully Mainstream Nutrition services in care & treatment – Action Points

• Alignment – include adult height & BMI in the BLUE CARD and Reporting
• Integrate Nutrition Services in Strengthening Data Quality Assurance in
• Demystify nutrition care and integrate in pre and in-service training
• Provide Intensive Nutrition Counseling at first contact & reinforce in follow-up contacts + IEC materials;
• Strengthen the fight against stigma
Additional Opportunities

• Future 2: Improve knowledge and capacity to manage gut health
• Future 3: Improve FBP regimens + Targeted Cytokine Blockers
• Future 4: Include inflammatory burden assessment – key Acute Phase Proteins in patient assessment
Acknowledgments

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