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

Nutrition and HIV Program

Implementers Meeting August 2010, Nairobi
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</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. <strong>BMI increase 2.2 ± 1.9 vs 1.7 ± 1.6</strong>; 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. <strong>Wt gain 1.9 &amp; 1.0 kg in 1st mo and 4.6 &amp; 3.4 kg by 3rd mo</strong> 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></th>
<th>ART</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>&lt; 16</td>
<td>1918</td>
<td>27.5</td>
<td>1535</td>
<td>21.7</td>
<td></td>
</tr>
<tr>
<td>16 - 17</td>
<td>1398</td>
<td>20.0</td>
<td>1275</td>
<td>18.1</td>
<td></td>
</tr>
<tr>
<td>17 - 18.5</td>
<td>2500</td>
<td>35.8</td>
<td>2694</td>
<td>38.2</td>
<td></td>
</tr>
<tr>
<td>18.5 – 21.9</td>
<td>1158</td>
<td>16.6</td>
<td>1557</td>
<td>22.1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6974</td>
<td>100.0</td>
<td>7061</td>
<td>100.0</td>
<td></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><strong>Pre-ART</strong></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><strong>ART</strong></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></th>
<th>ART</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>&lt; 10%</td>
<td>280</td>
<td>78.2</td>
<td>746</td>
<td>79.7</td>
<td></td>
</tr>
<tr>
<td>&gt; 10%</td>
<td>78</td>
<td>21.8</td>
<td>190</td>
<td>20.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>358</td>
<td>100.0</td>
<td>936</td>
<td>100.0</td>
<td></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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