Improving Severe Acute Malnutrition Care

Buka General Hospital
Dr Edwinah Baleo
Introduction:

Global < 5yrs:
- 99 million = underweight,
- 68 million = wasted (8%)
  (severely wasted-3%)

(WHO/UNICEF/WB=2013)

Mortality risk =45%

• Risk- ill health, poor growth, reduced intellect and poor social capacity

• PNG:
  - case fatality (2014)=18 %
  - admission(2014)= 14.9%

Bougainville:
  - case fatality (2014)= 14.9%
  - admission( 2014)= 12.4%

Protocol Adoption (2014):

Significant improvement in treatment outcomes – PMGH Landi (2014)

• **Objective:**
  - Improve quality of malnutrition care- outpatient and in-patient.

• **Aim:**
  - Assess quality nutritional care
  - Validate significant improvements from the implementation of the WHO/NDOH recommended treatment guideline
Treatment intervention

Staff Education:
- 2 sessions on SAM screening & 10 aspects of patient care
- Therapeutic feeding (F-75,F100,RUTF)
- Continued teachings throughout study
- Case registry introduced-OPD/OTC

Appropriate equipment/supplies:
- Necessary screening equipment provided
- Therapeutic feeds sourced (F-75,F-100, Eezee paste) –NDOH
- Constant supply made available in ward and OTC (RUTF)
- Frequent feeding schedule

Man power:
- Integrative management approach for care emphasised (Limited capacity to expand staffing)
On-duty staff (nursing /medical) assessed patients –anthropometry, temperature, glucose, hydration monitoring and feeding
Methodology

- **Study**: Point prevalence

- **Timeline**:
  - Primary survey - Feb
  - First training session - March
  - First post inter. survey - March-April
  - Second post. Inter. Survey - May – June
  - Second training session - June
  - Third post inter. Survey - June-July

**Admission criteria**:
- **1. Severe (SAM)**
  - 1. WFH z-score < -3SD
  - 2. MUAC < 11.5 cm (child > 6 mo, no oedema)
  - 3. Presence of oedema (kwashiorkor)
  - 4. WFA < -3SD or < 60% (last option)

- **2. Moderate: (MAM)**
  - 1. WFH z-score < -2SD
  - 2. WFA z-score < -2SD or between 60-80%
  - 3. MUAC between 11.5-12.5 cm (child > 6 mo, no oedema)

**OPD**_ all patients <5 yrs screened
**Inpatient** - recruited all SAM cases
Measured outcomes...

- **OPD/OTC:**
  - Standard anthropometry
  - Appetite testing
  - Case recording

- **In patient:**
  - Compliance to treatment guideline
  - Feeding initiation
  - Post treatment weight gain
Data analysis

Analysis: Data was analysed by STATA (13.1)=95%
Confidence interval
categorical statistics= Chi square test, Fishers exact test
& t-test

1 case fatality.
Exclusion criteria- children older than 5 years.
• Verbal consent for inclusion was obtained from all patients in the study
## OPD

<table>
<thead>
<tr>
<th></th>
<th>Primary Survey</th>
<th>1st PI survey</th>
<th>2nd PI survey</th>
<th>3rd PI study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total cases surveyed</strong></td>
<td>50</td>
<td>31</td>
<td>21</td>
<td>32</td>
</tr>
<tr>
<td><strong>Mean age (months)</strong></td>
<td>22.2</td>
<td>16.4</td>
<td>22.2</td>
<td>20.9</td>
</tr>
<tr>
<td><strong>Median (IQR)</strong></td>
<td>18 (5,38)</td>
<td>10 (8,24)</td>
<td>18 (5,38)</td>
<td>12 (5,36)</td>
</tr>
<tr>
<td><strong>Std. deviation</strong></td>
<td>17.32</td>
<td>13.47</td>
<td>18.83</td>
<td>19.02</td>
</tr>
</tbody>
</table>

## Inpatient

<table>
<thead>
<tr>
<th></th>
<th>Primary Survey</th>
<th>1st PI survey</th>
<th>2nd PI survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Cases recruited</strong></td>
<td>20 (16%)</td>
<td>20 (19%)</td>
<td>15 (13%)</td>
</tr>
<tr>
<td><strong>Mean Age (months) (Std. deviation)</strong></td>
<td>19.8 (15.7)</td>
<td>15.3 (9.6)</td>
<td>10.1 (5.3)</td>
</tr>
<tr>
<td><strong>Median (IQR)</strong></td>
<td>12 (9,30)</td>
<td>14 (7.5, 21)</td>
<td>9 (6,12)</td>
</tr>
<tr>
<td><strong>Length of stay (Days)</strong></td>
<td>9.3</td>
<td>11.5</td>
<td>10</td>
</tr>
<tr>
<td><strong>Median (IQR)</strong></td>
<td>5.5 (3,8.5)</td>
<td>7 (5.17)</td>
<td>10 (7,14)</td>
</tr>
</tbody>
</table>
Gender distribution-OPD

- Gender distribution-in-patient

<table>
<thead>
<tr>
<th></th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Post interven 1</td>
<td>85</td>
<td>15</td>
</tr>
<tr>
<td>Post interven 2</td>
<td>73.3</td>
<td>26.7</td>
</tr>
</tbody>
</table>

Baseline, Post interven 1, Post interven 2
Anthropometry - OPD

<table>
<thead>
<tr>
<th></th>
<th>WT</th>
<th>HT</th>
<th>MUAC</th>
<th>WFA (%)</th>
<th>ZS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P value</td>
<td>&lt;0.00</td>
<td>&lt;0.00</td>
<td>&lt;0.00</td>
<td>&lt;0.00</td>
<td>&lt;0.00</td>
</tr>
</tbody>
</table>

Graph:
- Weight taken
- Height taken
- MUAC taken
- Centile chart plotted (NCHS)
- Zscore correctly identified

Baseline: 0%
P = <0.00

Post interven. 1: 13%
P = <0.00

Post interven. 2: 65%
P = <0.00

Post interven. 3: 100%
P = <0.00
# Frequency of Nutritional State - MUAC

<table>
<thead>
<tr>
<th>Total</th>
<th>Primary Survey</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; PI survey</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; PI survey</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; PI survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (&gt;12.5 cm)</td>
<td>40 (80%)</td>
<td>30 (97 %)</td>
<td>18 (86%)</td>
<td>26 (81%)</td>
</tr>
<tr>
<td>Moderate (11.5 to ≤ 12.5 cm)</td>
<td>8 (16%)</td>
<td>1 (3 %)</td>
<td>3 (14%)</td>
<td>3 (9%)</td>
</tr>
<tr>
<td>Severe (&lt;11.5 cm)</td>
<td>2 (4%)</td>
<td>0</td>
<td>0</td>
<td>3 (9%)</td>
</tr>
</tbody>
</table>
## OTC-Frequency of case registry

<table>
<thead>
<tr>
<th># of cases recorded in registry</th>
<th>Primary</th>
<th>1st post intervention survey</th>
<th>2nd post intervention</th>
<th>3rd post intervention surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>10</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency-Appetite test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
</tr>
<tr>
<td>Post interven. 1</td>
</tr>
<tr>
<td>Post interven. 2</td>
</tr>
<tr>
<td>Post interven. 3</td>
</tr>
</tbody>
</table>

- 0%  
- 83%  
- 86%  
- 100%
Inpatient management

Blood glucose monitoring – 35% (p value <0.5)
40% (p value <0.53).

Albendazole was at 75%-90% (p value 0.2)
86.7% (p –value 0.3)

Only 3 cases - tested for HIV in the post intervention era.

Due to non-availability of biochemistry tests in the laboratory, adequate electrolyte analysis could not be achieved.
Therapeutic feeding....

<table>
<thead>
<tr>
<th></th>
<th>Primary</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; post intervent.</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; post interven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases Appropriately commenced on feeds</td>
<td>5 (25%)</td>
<td>20 (100%)</td>
<td>15 (100%)</td>
</tr>
<tr>
<td>Cases Feeding within 6hrs</td>
<td>3 (15%)</td>
<td>15 (75%)</td>
<td>14 (93%)</td>
</tr>
<tr>
<td>Cases Feeding within 24hrs</td>
<td>2 (10%)</td>
<td>5 (25%)</td>
<td>1 (7%)</td>
</tr>
<tr>
<td>P value</td>
<td>na</td>
<td>&lt;0.00</td>
<td>&lt;0.00</td>
</tr>
<tr>
<td>Ave. No of feeds per day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>4 0 (0,240)</td>
<td>7 5.5 (4,8)</td>
<td>8 7 (7,8)</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>0.00</td>
<td>0.005</td>
</tr>
<tr>
<td>Average vol of feeds per day (mLs /day)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>672 130 (130,130)</td>
<td>802.2 130 (130,130)</td>
<td>862.3 130 (130,130)</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>250</td>
<td>270</td>
<td>234</td>
</tr>
<tr>
<td>P value</td>
<td>Na</td>
<td>&lt;0.00</td>
<td>&lt;0.00</td>
</tr>
</tbody>
</table>
Inward weight gain outcomes...

**Baseline** - an average weight gain of 8.2g/kg/day.

**1st post intervention survey** - mean of 10.3kg, *(p-value <0.00)*.

**The final survey**  *(p- value 0.00 )*  
Mean weight in this study period was 9kg.
Discussion:

- Prior to the intervention: nutritional assessment deficient (tempt & weight)
- Significant improvements in malnutrition anthropometry (HT/MUAC/Z-score)
- Anthropometry enables better assessment of nutritional risk amongst OPD <5 yrs attendances
- OPD - adapted well to the usage of appetite testing
- Inpatient Mx of SAM also showed improvements.
  - therapeutic feeding (p value 0.01)
  - feeding initiation (p value <0.00)
  - regular feeds (p value 0.005)
  - Improved weight gains (p value of <0.00)
- Hazardous effects of potential fluid overload avoided by improved rehydration (oral)
- Adherence in the area of temperature, glucose and deworming - trivial improvements (p-value 0.2-0.5).
  - Observed decreased case fatality rate
  - 14.9% vs 2% >5 months now
  - Areas for improvement included HIV screening and proper data management.
  - Sufficient electrolytes in therapeutic feeds despite lack of biochemistry studies
  - Ward space limitation – Nutrition ward
  - Ongoing technical supervision required

*Global Nutrition Report ’Actions and Accountability to accelerate worlds progress on nutrition”.*
Conclusion

• Intervention:-Significant improvements in severe acute malnutrition care-BGH

• Sustained implementation required for improvement of current statistics.

• Recommendation for review of data entry at OPD possibly by adoption of integrated registry by NDOH (instead of separate entries)

• Adoption should be encouraged in other centres
Acknowledgements:

- I would like to thank the following people/groups who have assisted in respective ways in the compilation of this research.

- Dr Mathias Tovilu- Paediatrician
- Dr Welch- Nutritionist/Paediatrician
- Prof J Vince- Professor Paediatrics
- World Vision-Bougainville
- Sr Magasia-Nursing Training Supervisor
- OPD staff –Buka General Hospital
- Paediatric staff- Buka General hospital
- Technical support services-Buka General Hospital
- Agnes Tioloni-OIC Medical Records
- EPI Division –Health Department-AROB
- All contributing staff Buka General Hospital
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