MEASUREMENT OF MATERNAL POSTPARTUM FATIGUE IN PERU USING STANDARDIZED SCALES

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November 26, 2015
Soil-Transmitted Helminths

The soil-transmitted helminths (STHs) are endemic in over 100 countries, affecting ~1.5 billion people globally.

They include:

a) *Ascaris* (roundworms)
b) *Trichuris* (whipworms)
c) *Necator* and *Ancylostoma* (hookworms)
BACKGROUND

Å CONSEQUENCES
  o Nutritional impairment
  o Blood loss and anemia
  o Fatigue

Å HIGH RISK GROUPS
  o Preschool-age children
  o School-age children
  o Women of reproductive age (WRA)
    ➢ Including pregnant and lactating women
Figure 1: Proportion of children (1-14 years) requiring preventive chemotherapy, 2013

DEWORMING
Recommendations in WRA

WHO INFORMAL CONSULTATION IN 1994

- Concluded that pregnant and lactating women should be included based on expert opinion and data in other populations
- Called for research on lactation performance following STH control

Lack of empirical evidence on benefits to mothers and children; Lactating women still excluded from deworming programs (equipoise)
OBJECTIVES

To estimate the effectiveness of maternal postpartum deworming following delivery at 1, 6, 12 and 24 months postpartum on:

1. Infant growth
   2. Maternal fatigue
METHODS
Setting and Design

SETTING
Â Amazon region of Iquitos Peru

DESIGN
Â Double-blind randomized controlled trial

SAMPLE SIZE
Â 1 010 mother-infant pairs

Figure 2: Map of Iquitos, Loreto, Peru
METHODS

Intervention

Pre-recruitment in third trimester of pregnancy

1124 excluded
Did not meet inclusion criteria (n=886)
Declined to participate (n=175)
Other* (n=63)

Recruitment at Hospital Iquitos

1010 randomized

510 allocated to albendazole

Follow-up
1, 6, 12 and 24 months

500 allocated to placebo

Follow-up
1, 6, 12 and 24 months
METHODS
Fatigue Scales

MAF
- 16 questions
- Numerical responses
- Global Fatigue Index

Example question:
In the past week, to what degree has fatigue interfered with your ability to:
Do household chores

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>
NOT AT ALL | A GREAT DEAL

FAS
- 10 questions
- Numerical/Verbal responses
- Scoring with 10 items

Example question:
I get tired very quickly

<table>
<thead>
<tr>
<th>NEVER</th>
<th>SOMETIMES</th>
<th>REGULARLY</th>
<th>OFTEN</th>
<th>ALWAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
RESULTS

Table 1: Fatigue scores at 1 month postpartum, as assessed by the Multidimensional Assessment of Fatigue (MAF)

<table>
<thead>
<tr>
<th></th>
<th>Albendazole</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>506</td>
<td>493</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>21.6 ± 8.1</td>
<td>21.7 ± 8.0</td>
</tr>
<tr>
<td>Range</td>
<td>1-44.0</td>
<td>1-46.6</td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td>0.87</td>
<td>0.84</td>
</tr>
<tr>
<td>% Fatigued</td>
<td>41.9</td>
<td>42.8</td>
</tr>
</tbody>
</table>

¹Cut-offs for fatigue scores of 22 for MAF
RESULTS

1 month (MAF) n=999

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficient</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment group</td>
<td>0.05</td>
<td>-9.0, 1.0</td>
<td>0.925</td>
</tr>
<tr>
<td>Age</td>
<td>0.08</td>
<td>0.01, 0.2</td>
<td>0.022</td>
</tr>
<tr>
<td>District</td>
<td>-0.07</td>
<td>-1.1, 0.9</td>
<td>0.896</td>
</tr>
<tr>
<td>Secondary school</td>
<td>0.3</td>
<td>-0.5, 1.3</td>
<td>0.620</td>
</tr>
<tr>
<td>Predominant feeding</td>
<td>-1.8</td>
<td>-3.0, -0.7</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Å Older mothers had higher fatigue scores

Å Mothers who predominantly breastfed had lower fatigue scores compared to mothers who practiced complementary feeding
## RESULTS

**Table 2:** Fatigue scores at 6 months postpartum, as assessed by the Fatigue Assessment Scale (FAS)

<table>
<thead>
<tr>
<th></th>
<th>Albendazole</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>489</td>
<td>481</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>23.5 ± 5.5</td>
<td>23.9 ± 5.8</td>
</tr>
<tr>
<td>Range</td>
<td>12 ñ 43.0</td>
<td>10 ñ 43.0</td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td>0.74</td>
<td>0.77</td>
</tr>
<tr>
<td>% Fatigued</td>
<td>61.4</td>
<td>63.8</td>
</tr>
</tbody>
</table>

¹Cut-offs for fatigue scores of 28 for FAS
RESULTS

6 month (FAS) n=970

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficient</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment group</td>
<td>-0.2</td>
<td>-0.9, 0.5</td>
<td>0.509</td>
</tr>
<tr>
<td>Age</td>
<td>0.02</td>
<td>-0.03, 0.07</td>
<td>0.397</td>
</tr>
<tr>
<td>District</td>
<td>1.0</td>
<td>0.3, 1.7</td>
<td>0.005</td>
</tr>
<tr>
<td>Secondary school</td>
<td>0.9</td>
<td>0.2, 1.6</td>
<td>0.017</td>
</tr>
<tr>
<td>Hemoglobin (mg/dL)</td>
<td>-0.4</td>
<td>-0.6, -0.09</td>
<td>0.009</td>
</tr>
</tbody>
</table>

Å Mothers living in the **Belen district** had higher fatigue scores

Å Mothers who did not complete **high school** had higher fatigue scores

Å Mothers with higher **hemoglobin** levels had lower fatigue scores
RESULTS

6 month (FAS) n=962

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficient</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment group</td>
<td>-0.9</td>
<td>-0.8, 0.6</td>
<td>0.815</td>
</tr>
<tr>
<td>Age</td>
<td>0.02</td>
<td>-0.03, 0.07</td>
<td>0.457</td>
</tr>
<tr>
<td>District</td>
<td>1.0</td>
<td>0.3, 1.7</td>
<td>0.006</td>
</tr>
<tr>
<td>Secondary school</td>
<td>0.8</td>
<td>0.04, 1.5</td>
<td>0.038</td>
</tr>
<tr>
<td><strong>Ascaris infection</strong></td>
<td><strong>1.2</strong></td>
<td><strong>0.2, 2.1</strong></td>
<td><strong>0.017</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficient</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment group</td>
<td>-0.2</td>
<td>-0.8, 0.6</td>
<td>0.676</td>
</tr>
<tr>
<td>Age</td>
<td>0.02</td>
<td>-0.03, 0.07</td>
<td>0.506</td>
</tr>
<tr>
<td>District</td>
<td>1.0</td>
<td>0.3, 1.7</td>
<td>0.006</td>
</tr>
<tr>
<td>Secondary school</td>
<td>0.8</td>
<td>0.09, 1.5</td>
<td>0.027</td>
</tr>
<tr>
<td><strong>Hookworm infection</strong></td>
<td><strong>1.7</strong></td>
<td><strong>0.07, 3.4</strong></td>
<td><strong>0.041</strong></td>
</tr>
</tbody>
</table>

Mothers infected with *Ascaris* and *hookworm* had higher fatigue scores, adjusted for age, district of residence and education level.
DISCUSSION

Â Fatigue levels were similar in both intervention groups.

Â At 6 months, fatigue was associated with hemoglobin levels, and STH infection.
  ➢ First study on STHs to assess fatigue using standardized scales.

Â FAS shows promise in assessing fatigue in STH-endemic areas.
ACKNOWLEDGEMENTS

Funding
- Bill and Melinda Gates Foundation
- International Development Research Centre (IDRC)
- Canadian Institutes of Health Research (CIHR)

Co-investigators
- Martín Casapía; Antonio Montresor; Elham Rahme; William Fraser; Grace Marquis; Jozef Vercruysse; Lindsay Allen

Collaborators
- Dirección Regional de Salud (DIRESA)
- Hospital Iquitos

Handlers

Research personnel
- Norma Peñafiel
- Gina Gonzales
- Dori Pzashanaste
- Karen Apagüeño
- Patsy Torres
- Zuleyka Saavedra
- Lucelia Pinedo
- Rosa Charpentier
- Nancy Cumpa
- Claudia Sanjurjo
- Abby Ruiz
- Dannay Bardales
- Nathaly Gonzales
- Fátima Angulo
- Mayra Gúzman
- Jeannine Del Aguila
- Thalía Gutierrez
- Gina Ahuanari
- Jaqueline Gutierrez
- Frederic Leguia
Thank you!