Community-Based Prevention and Management of Severe Pre-eclampsia and Eclampsia in a low resource setting of Bangladesh

Jannatul Ferdous  (MDC 2007-08, ITM)
Reproductive Health Advisor, MoH, Timor-Leste
& Consultant, icddr,b

ITM 57th Colloquium, Rabat, Morocco
26th November, 2015
Demographic Indicators

- Population: 166.2 million
- Area: 130,168 sq.km
- Density: 1238 persons/sq.km
- Urban: 28%
- Growth rate: 1.6%
- Birth rate: 20.8/1000 pop.
- Death Rate: 5.6/1000 pop.
- Life expectancy: 70.7 years.
- Children < 5 years: 15 million (10%)
- 0-14 years: 32% of population
- Poverty: 31.5% below poverty line (18% is lowest wealth quintile)
- GNI per capita: US$ 1,080
- Adult literacy rate: 75.1%
- Access to improved drinking water sources: 87.5%
- Access to improved sanitation facilities: 61%
Health Indicators in Bangladesh

- MMR: 194/100,000 live births (BMMS 2010)
- Neonatal mortality: 28/1000 live births
- IMR: 38/1000 live births
- U5MR: 46/1000 live birth
- Total Fertility Rate: 2.3
- Teenage pregnancy: 30.8/1000 girls (15-19)
- CPR: 62.4% any methods (54.1% modern methods)
- Unmet need: 5.3% for spacing (6.6% for limiting)
- Any ANC: 78.6% (57.9% by doctor, 12% by nurse, midwife, paramedic, FWV & CSBA)
- ANC 4+: 31.2%
- SBA: 42% (31% by doctor, 11% by nurse/midwife, paramedic, FWV & CSBA)
- Facility Births: 37.4% (public: 12.8, private: 22.4, NGO: 2.2)
- C/S: 22.9%
- PNC: 33.9, newborn: 31.5
- Complete immunization: 78%
- Exclusive breast feeding: 55%
- Undernutrition: stunting: 36%, wasting: 14%, underweight: 33%

Source: BDHS 2014
Background

Severe-pre-eclampsia and eclampsia are the second leading causes of direct obstetric deaths in Bangladesh and constitute 20% of all maternal deaths.

Over 100,000 women develop eclampsia and pre-eclampsia and around 2,000 women die each year in Bangladesh, which accounts for 4% of the estimated 50,000 eclamptic deaths globally.

Magnesium sulphate (MgSO₄) is choice of affordable treatment option to reduce the risk of seizures associated with severe pre-eclampsia and eclampsia.

Evidence for feasibility and effectiveness of use of MgSO₄ at the community level to prevent and treat eclampsia are rare.
Study objectives

- Identify and manage severe pre-eclampsia and eclampsia at community through trained Community-based Skilled Providers (CSPs) with injectable MgSO$_4$ and other logistics prior to hospital referral

- **Compare the maternal and perinatal outcomes** (i.e., maternal deaths, perinatal & neonatal death) in intervention and control groups

- Understand the factors that influence identification and use of MgSO$_4$ in severe pre-eclampsia and eclampsia at community
## At a Glance

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upazilla</td>
<td>8</td>
</tr>
<tr>
<td>Union</td>
<td>77</td>
</tr>
<tr>
<td>Village</td>
<td>2,142</td>
</tr>
<tr>
<td>Pourashava</td>
<td>6</td>
</tr>
<tr>
<td>Ward</td>
<td>54</td>
</tr>
<tr>
<td>Area (sq km)</td>
<td>2636.59</td>
</tr>
<tr>
<td>Density per sq. km</td>
<td>792</td>
</tr>
<tr>
<td><strong>Total Population</strong></td>
<td><strong>2,171,064</strong></td>
</tr>
<tr>
<td>Average Population per Upazilla</td>
<td>271,383</td>
</tr>
<tr>
<td>Average Population per Union</td>
<td>28,195</td>
</tr>
<tr>
<td>Average Population per Village</td>
<td>1014</td>
</tr>
<tr>
<td>Annual Growth Rate</td>
<td>1.72</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>96</td>
</tr>
<tr>
<td>Total Households</td>
<td>393,302</td>
</tr>
<tr>
<td>Literacy</td>
<td>40.5%</td>
</tr>
</tbody>
</table>

**Source:**
Community Report Habiganj Zila June 2012
Bangladesh Bureau of Statistics, Statistics and Informatics Division, Ministry of Planning, Bangladesh
**Sample size**

**Sample size**: 302 cases of severe-pre-eclampsia and eclampsia in each intervention and control group to fulfill study objectives (N=604).

Having 604 cases, the study required 8,683 pregnancies in each group (Requires total of 17,366 pregnant mothers).

3 sub-districts as intervention and 4 sub-district as control of Habiganj district

301 and 302 cases in intervention and control arms were enlisted over 12 months of study during 2013-2014.
Methodology

Intervention area:

✓ Listing and identification;
✓ early loading dose of MgSO₄ (10gm by I/M in two divided doses) by trained CSPs
✓ referral to a facility.

Control area:

✓ Listing and identification
✓ referral to a facility as per standard program practice.

- Information was obtained from records of CSPs, service records at facilities, and, through structured interviews with cases
- Qualitative method such as Focus Group Discussions (FGDs) among both community based and facility based providers
Case by type

Intervention
n=301 (E: 111; SPE: 190)

Eclampsia: 37%
Severe Pre Eclampsia: 63%

Control
n=302 (E: 184; SPE: 118)

Eclampsia: 40%
Severe Pre Eclampsia: 60%
## Reproductive History

<table>
<thead>
<tr>
<th>Characteristics (Age and parity)</th>
<th>SPE</th>
<th>Eclampsia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention (n=154)</td>
<td>Control (n=79)</td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>25.3</td>
<td>19.0</td>
</tr>
<tr>
<td>20-30 years</td>
<td>61.7</td>
<td>59.5</td>
</tr>
<tr>
<td>&gt;30 years</td>
<td>13.0</td>
<td>21.5</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>24.9</td>
<td>26.7</td>
</tr>
<tr>
<td>Primi para</td>
<td>44.8</td>
<td>27.8</td>
</tr>
<tr>
<td>Multi para</td>
<td>55.2</td>
<td>72.2</td>
</tr>
</tbody>
</table>
# Antenatal care visits

( intervention & control )

<table>
<thead>
<tr>
<th>4 ANC from skilled provider including doctors</th>
<th>Intervention %[n=224]</th>
<th>Control %[n=196]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received</td>
<td>38.4 (n=86)</td>
<td>30.6 (n=60)</td>
</tr>
</tbody>
</table>

P=0.09 (>0.09) 224 and 196 mothers received at least one ANC from skilled providers

<table>
<thead>
<tr>
<th>Sources [Providers]</th>
<th>Intervention %[n=224]</th>
<th>Control %[n=196]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBBS Doctor/Private Clinic</td>
<td>49.6 (n=111)</td>
<td>53.1 (n=104)</td>
</tr>
<tr>
<td>CSPs ( CSBA, FWVs)</td>
<td>58.9(n=132)</td>
<td>39.8(n=78)</td>
</tr>
</tbody>
</table>

P: FWV=0.00 (<0.05)  Multiple response
Source of diagnosis by providers (intervention & control)

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>Control</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBBS doctors</td>
<td>75.7</td>
<td>54.4</td>
</tr>
<tr>
<td>Community skilled providers (CSBAs, FWVs, Paramedic, SACMO)</td>
<td>12.9</td>
<td>35.5</td>
</tr>
<tr>
<td>Others (TTBAs)</td>
<td>11.4</td>
<td>10.1</td>
</tr>
</tbody>
</table>

P = 0.001 (<0.05)
<table>
<thead>
<tr>
<th>ID</th>
<th>Question</th>
<th>Author</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>I18</td>
<td>objective 1</td>
<td>lira</td>
<td>14/10/2014</td>
</tr>
<tr>
<td>JF5</td>
<td>who is paramedic?</td>
<td>Jannatul Ferdous</td>
<td>15/05/2015</td>
</tr>
</tbody>
</table>
Identification and management by CSPs with loading MgSO$_4$

- Loading MgSO$_4$ receipt CASEs: 24% of 301 cases
- Severe pre-eclampsia: 77% of 73 cases
- Eclampsia: 23% of 73 cases

n=301

n=73
Referral by skilled providers

By CSPs:
Intervention: 48%;
Control: 13%

- MBBS: Control (n=98) 92.9%, Intervention (n=145) 64.1%
- FWV: Control (n=98) 5.1%, Intervention (n=145) 22.1%
- CSBA: Control (n=98) 1%, Intervention (n=145) 4.8%
- Paramedic: Control (n=98) 3.1%, Intervention (n=145) 18.6%
- SACMO: Control (n=98) 4.1%, Intervention (n=145) 2.8%

P (MBBS)=0.00  P (FWV)=0.00  P (CSBA)=0.01  P (Paramedic)=0.00
Progression after loading MgSO$_4$ receipt by CSPs

- SPE converted to Eclampsia
- Eclampsia developed recurrent convulsion

- 00
- 02
objective 2,
## Deaths (Intervention & control)

### Outcome of last pregnancy

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SPE (n=190)</td>
<td>Eclampsia (n=111)</td>
<td>SPE (n=118)</td>
<td>Eclampsia (n=184)</td>
</tr>
<tr>
<td>Maternal death (n)</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>14</td>
</tr>
</tbody>
</table>

### Outcomes of last pregnancy

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SPE % (n=190)</td>
<td>Eclampsia % (n=111)</td>
<td>SPE % (n=118)</td>
<td>Eclampsia % (n=184)</td>
</tr>
<tr>
<td>Abortion</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Perinatal death</td>
<td>15.3 (29)</td>
<td>18.0 (20)</td>
<td>13.6 (16)</td>
<td>14.7 (27)</td>
</tr>
<tr>
<td>Neonatal death*</td>
<td>7.4(14)</td>
<td>6.3 (7)</td>
<td>3.4(4)</td>
<td>9.2(17)</td>
</tr>
</tbody>
</table>
### Outcomes of last pregnancy

<table>
<thead>
<tr>
<th>Intervention</th>
<th>SPE (n=52)</th>
<th>Eclampsia (n=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal death (n)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Outcomes of last pregnancy

<table>
<thead>
<tr>
<th>Intervention</th>
<th>SPE (n=52)</th>
<th>Eclampsia (n=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortion</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Perinatal death</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Neonatal death*</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
FGD results on quality ANC

- Substandard ANC by CSPs while observation, but denial about the sub-standard blood pressure measurement

- Lack of infrastructure at the home/community-based clinic for urine test,

  “The house owners don’t give permission to use their toilet”.

- Supply problem of strip was not mentioned by community level providers

- Lack of availability of strip and laboratory facility for urine test were reported by facility level providers
Community based skilled providers correctly stated the signs and symptoms of SPE and eclampsia, the age group who are at risk and blood pressure measurement and urine test techniques.

They demonstrated positive attitudes towards the training on SPE and eclampsia and its management.

While the facility based providers reported having no such formal training on SPE and eclampsia and lack of knowledge was evident among them.
FGD results on practice

Full coverage of ANC by community level providers claimed by community based skilled providers

THE CRITICAL QUESTION: why a large number of case mothers are available from hospital record rather than the CSP’s register??

“All mothers have to come for ANC. A single mother will not be excluded from ANC. Beside this, every household have to be knocked, to try to understand the reasons why mothers are not coming for ANC at the community based clinic. Community based skilled providers

Facility level provider’s argument,

“When mother came to the facility we asked them, did anybody go to your house for checkup, mother replied ‘NO’. I feel sorry, they received the training but they are not visiting the mother’s HH at least once.”
Community level providers were highly confident about administering MgSO$_4$.

"MgSO$_4$ works like a magic".

However they said,

"The basic training given on severe pre eclampsia and eclampsia was not sufficient. The algorithms we follow are not that simple. At least 10 days training should be given on severe pre eclampsia and eclampsia. If the foundation of the building is not strong, it is of no use to build 2-3 floors’

Sub-district level providers at facilities were scary about the eclamptic fit.

"Actually after administering MgSO$_4$ if patient died in the field, the situation will be dangerous for the provider".
FGD results on barriers

- Lack of mobilization of community based providers

- Simply providing training and logistics do not have the influence to engage the community level providers successfully.

- Lack of active supportive supervision by higher authority
Conclusion

• Significantly higher proportion of SPE/E have been identified and referred to higher level facilities from the intervention as compared to control areas by CSPs

• One-fourth of the case mothers have received loading dose of MgSO4 by CSPs

• Case mothers attendance for antenatal care by CSP significantly higher in the intervention area

• Identification and reporting of pregnancies and cases may not be completed and this may led to errors in estimating the cases and death

• The program was constrained due to supervision structure, ANC coverage, quality of ANC services
Recommendations

- Strengthening strategy for existing ANC by CSPs at community-based clinics and giving early loading dose could be resulted in the best possible outcome with available resources (necessary especially for women who are not able to reach a facility timely).

- All stakeholders should bring into board to provide supportive supervision to this community based management of SPE and eclampsia.
icddr,b thanks its Core Donors

- Australian Aid
- Canada
- Sweden
- UK Aid from the British people