Nutritional interventions for Ill & Vulnerable Newborns
Institutional & country level

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Neonatology,
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Improving Nutrition services workshop Accra Ghana Oct 30 – Nov 2
Understanding Neonatal Health

An estimated 47% babies born in India are small for gestational age or “born too small” – making them more vulnerable.
Preterm birth – Absolute numbers

10 countries with the greatest number of PT births:

India: 3 519 100
China: 1 172 300
Nigeria: 773 600
Pakistan: 748 100
Indonesia: 675 700
USA: 517 400
Bangladesh: 424 100
Philippines: 348 900
Congo: 341 400
Brazil: 279 300

Prematurity is the leading cause of neonatal mortality

An estimated three-fourth premature babies can be saved with cost-effective and feasible interventions.
Breastfeeding is the most powerful intervention to prevent neonatal deaths

- ~230,000 lives could be saved globally.
- ~450,000 lives could be saved globally.
- ~500,000 lives could be saved globally.
- ~823,000 (14%) of <5 deaths would be prevented by breastfeeding alone.

However, breastfeeding rates continue to remain low in India.
Human milk

• Breast milk is a complete food
• Species specific
• Quantitatively & qualitatively appropriate & adequate
• Considered crucial to child survival and health
Human milk

In absence of human milk the vulnerable infant (Sick & small) is deprived of

- Nutrients as well as
- Anti-infective factors
- Growth factors
7 crucial components of human milk

• Human milk Oligosaccharides
• Antibodies
• Anti-oxidants
• Lactoferrin
• Osteopontin
• White blood cells
• Stem cells
• Microbiome - microbiota
Vaginally delivered infants acquired bacterial communities resembling their own mother’s vaginal microbiota and C-section infants harbored bacterial communities similar to those found on the skin surface. (Dominguez-Bellow, MG. Proc Natl Acad Sci U S A. 2010 Jun 29;107(26):11971-5)
Entero-mammary Circuit

Table 5a. Multivariable Logistic Regressions: Antibiotic Duration and NEC or Death *

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Duration of initial empirical antibiotics (odds per day)</th>
<th>Prolonged initial empirical antibiotics (&gt; 5 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>NEC or Death</td>
<td>1.04 (1.02, 1.06)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Total N=3883</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N w/outcome=884</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC</td>
<td>1.07 (1.04, 1.10)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total N=3899</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N w/outcome=427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>1.16 (1.08, 1.24)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total N=3882</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N w/outcome=631</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Institutional level

1. LHMC – 14000 births a year
2. Prematurity rate -25%
3. LBW rate – 38%
4. Birth – Sick or Healthy
5. Healthy – Maternity wards
6. Sick – NICU
7. Stable preterm, LBW <2000 Gm & SGA – Small baby ward
Expression of breastmilk for NICU babies

- Manual expression
- Pumping
Mother’s Expressed Breastmilk for Biologic baby
Early Total Enteral Feeding in Stable Very Low Birth Weight Infants: A Before and After Study

by Sushma Nangia,¹ Amit Bishnoi,² Ankita Goel,² Piali Mandal,² Soumya Tiwari,² and Arvind Saili¹

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²Department of Pediatrics, Lady Hardinge Medical College and Kalawati Saran Children Hospital, New Delhi 110001, India

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Phase 1 (N = 73)</th>
<th>Phase 2 (N = 51)</th>
<th>Phase 3 (N = 84)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day of full feed achievement* (days)</td>
<td>14.44 ± 6.2</td>
<td>8.97 ± 4.9</td>
<td>5.47 ± 1.8</td>
<td>0.0001</td>
</tr>
<tr>
<td>Day of regaining birth weight* (days)</td>
<td>16.4 ± 7.6</td>
<td>14.1 ± 6.5</td>
<td>12.3 ± 5.8</td>
<td>0.0006</td>
</tr>
<tr>
<td>Incidence of feed intolerance*</td>
<td>16 (22%)</td>
<td>7 (14%)</td>
<td>12 (14%)</td>
<td>0.28</td>
</tr>
<tr>
<td>Incidence of NEC#</td>
<td>10 (14.2%)</td>
<td>2 (4%)</td>
<td>0</td>
<td>0.028</td>
</tr>
<tr>
<td>Incidence of clinical sepsis#</td>
<td>67 (92%)</td>
<td>24 (47%)</td>
<td>19 (23%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Incidence of culture-proven sepsis#</td>
<td>32 (44%)</td>
<td>6 (12%)</td>
<td>3 (3.5%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Duration of antibiotic therapy* (days)</td>
<td>11.2 ± 6.8</td>
<td>4.3 ± 6.1</td>
<td>2.1 ± 4.2</td>
<td>0.0001</td>
</tr>
<tr>
<td>Duration of IV therapy* (days)</td>
<td>12.1 ± 5.7</td>
<td>6.47 ± 3.2</td>
<td>1.5 ± 0.4</td>
<td>0.0005</td>
</tr>
<tr>
<td>Duration of hospital stay* (days)</td>
<td>28.04 ± 6.76</td>
<td>19.47 ± 5.22</td>
<td>15.5 ± 4.04</td>
<td>0.0005</td>
</tr>
<tr>
<td>Mortality #</td>
<td>3 (4%)</td>
<td>1 (2%)</td>
<td>1 (1.2%)</td>
<td>0.18</td>
</tr>
</tbody>
</table>

*Mean ± SD, #Number (%).
Discharge Criteria for NICU & Small baby ward

• Regained Birth weight and is about 1350 +/- 50 gms.
• Consecutive weight gain for last 3 days – no less than 10gm/kg/day
• Maintaining temperature without external heat source
• Mother confident to take care of the baby
• Receiving & tolerating 180ml/kg/day feeds by paladai or on direct breastfeeds

Discharge advise:
• Maintain hygiene
• Tactile assessment & maintenance of temperature
• Breastfeeding & KMC at home (till baby wriggles out)
• Danger signs & immediate care seeking
• Follow up visits
• Immunization

6 RCTs on Early vs conventional discharge (1973-2000). No adverse effect of early discharge on Mortality/Later growth
It has to be... Community And Facility

Facility Care

(23 - 50 % NMR Reduction)

Community Care

(15 - 32 % NMR Reduction)

Out reach Care : (6 to 9 % NMR reduction)

Source : Lancet New born Series
Newborn care facilities at different levels

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>Facility for all newborns at birth</th>
<th>Facility for Sick newborns</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHC</td>
<td>Newborn Corner in Labour rooms</td>
<td>--------------------------</td>
</tr>
<tr>
<td>CHC/FRU</td>
<td>Newborn Corner in Labour rooms and in OT</td>
<td>Neonatal Stabilization Unit</td>
</tr>
<tr>
<td>District Hospitals</td>
<td>Newborn Corner in Labour rooms and in OT</td>
<td>Special Care Newborn Unit</td>
</tr>
<tr>
<td>Medical Colleges</td>
<td>Newborn Corner in Labour rooms and in OT</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
</tbody>
</table>
Government of India – Initiatives

‘SNCU Training Package’
Government of India – Initiatives

Operational Guidelines on:

1. Inj Vit K prophylaxis at birth
2. Use of ANCS for preterm labour
3. KMC & optimal feeding of LBW Infants
4. Use of Inj Gentamicin by ANM
India envisions a health system that eliminates preventable deaths of newborns and stillbirths and where every pregnancy is wanted, where every birth is celebrated, and where women, babies, and children survive, thrive, and reach their full potential.

Targets to achieve single digit NMR and SBR by 2030
Integrations

Partnerhips

Equity

Gender

In

A

P

Convergence

Quality of care

Accountability

Integration

Preconception & Antenatal Care

Care during labour & childbirth

Care of healthy newborn

Immediate newborn care

Care of small & sick newborn

Care beyond survival
Home Based Care By ASHA
Currently 9.4 Lakh ASHAs are in place

Currently on an average one ASHA covers a 899 population. 7% gap in ASHA selection – mostly in difficult / hard to reach areas leaving the most vulnerable groups uncovered

States with 1 ASHA for more than 1000 population are Rajasthan, Bihar, UP, Karnataka, Maharashtra, Punjab and WB (12% - 20% in Rajasthan and WB

Guidelines, dedicated budget lines in PIP, Institutional Mechanisms, Training package, Job aides, HBNC kits, support structure in place

In 2017-18 Rs 300 crores (27%) approved as incentives for ASHAs under HBNC

States with higher allocation: UP 58%, Punjab 36%, Gujarat 32%, Haryana & Bihar 30%
High coverage of HBNC visits observed during field visits

Role in increasing access for institutional deliveries, immunization, family planning services and more than 55% users sought ASHA’s advice for management of the sick newborn

Average time spent per day by ASHAs ranges from 1-4 hrs in Delhi to 4-6 hrs in Jharkhand of which – 70% is spent on MCH activities

Expanding range of activities thus difficulty in adhering to schedule of visits by ASHAs
Key Learnings from HBNC roll out -

Building the capacity

Institutionalizing the mechanism

- Completion of training of Module 6&7
- Ensure 15 days of training every year
- On the Job Support and mentoring – by ANM and ASHA facilitators ANM

monitoring and review systems

Strengthening of data systems and ownership

- Revitalize performance monitoring to identify weak areas
- Regular joint reviews to plan for corrective measures
- Enable functional referral mechanisms with effective follow up – both at the facility and community level
- Strengthen community participation by engaging with VHSNCs
Home Based Care for Young Child

Objectives of HBYC programme is to:

• Reduce child mortality and morbidity

• Improve nutrition status, growth and early childhood development through structured, focused and effective home visits by ASHAs.
Domain Specific Actions & Incentives

Promotion of evidence based interventions in four key domains:

<table>
<thead>
<tr>
<th>KEY DOMAINS</th>
<th>SPECIFIC ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUTRITION</td>
<td>• Exclusive breastfeeding for six months</td>
</tr>
<tr>
<td></td>
<td>• Adequate complementary feeding from six months &amp;</td>
</tr>
<tr>
<td></td>
<td>continued breast feeding up to two years of age</td>
</tr>
<tr>
<td></td>
<td>• Iron and folic acid (IFA) supplementation</td>
</tr>
<tr>
<td></td>
<td>• Promote use of fortified food</td>
</tr>
<tr>
<td>HEALTH</td>
<td>• Full immunization for children</td>
</tr>
<tr>
<td></td>
<td>• Regular growth monitoring</td>
</tr>
<tr>
<td></td>
<td>• Appropriate use of Oral Rehydration Solution (ORS) during diarrhoea episodes</td>
</tr>
<tr>
<td></td>
<td>• Early care seeking during sickness</td>
</tr>
<tr>
<td>CHILD DEVELOPMENT</td>
<td>Age appropriate play and communication for children</td>
</tr>
<tr>
<td>WASH</td>
<td>Appropriate hand washing practices</td>
</tr>
</tbody>
</table>

- Each ASHA will be entitled for a sum total of INR 250 **for completion of 5 additional home visits for each young child** starting from 3rd months and extending into 2nd year of life (in 3rd, 6th, 9th, 12th and 15th months).

- In case of twins/triplets the amount of incentive will be provided per child.

- The payment given after validating age appropriate vaccination and growth monitoring in MCP Card.
Age Appropriate Interventions to be Promoted During HBYC Visits

- **3 months (1st visit)**: Promote exclusive breastfeeding
- **6 months (2nd visit)**: Initiate complimentary feeding (CF), introduce IFA syrup, ORS
- **9 months (3rd visit)**: Increase frequency of CF and measles vaccine
- **12 months (4th visit)**: Increase amount of CF, give feeds adequate in quality and quantity
- **15 months (5th visit)**: Add variety of food from family pot, booster vaccination

Use of MCP Card as a tool

**Age Appropriate Play and Communication**
Key milestones of Newborn Survival in India

- **2011**: FBNC Launched
- **2014**: India Newborn Action Plan
- **2015**: MDG target likely attained
- **2030**: SDG target Single digit NMR
- **1990**: High NMR
- **1992**: CSSM launched
- **2005**: JSY
- **2009**: NSSK
- **2011**: NRHM launched
Shhhhhhh....