PERSPECTIVE

Mainstreaming Early and Exclusive Breastfeeding for Improving Child Survival

J P DADHICH AND RK AGARWAL*

*From S L Jain Hospital, Delhi, India and *R K Hospital, Udaipur, India.*
Correspondence to: Dr JP Dadhich, 23 Canara Apartments, Sector 13, Rohini, New Delhi 110 085, India. E-mail: jpdadhich@gmail.com

India is home to maximum number of under-five deaths and underweight children in the world. In 2006, for the first time, the number of children in the world dying before their fifth birthday fell below 10 million, to 9.7 million annually. South Asia's contribution to this figure was 3.1 million out of which 2.1 million deaths occurred in India *i.e.,* 21 percent of the global burden of under-five deaths. Most of these deaths occur during the neonatal period. A reduction in the number of deaths among the under-five children reflects the country's progress on the fourth Millennium Development Goal (MDG 4)(1-3).

About 55 million, or one-third of the world's underweight children under the age of five years, live in India. Malnutrition has been estimated to be an underlying cause of up to 50–60 percent of under-five deaths. The number of young underweight children reflects the country's progress on the first Millennium Development Goal (MDG 1), which deals with eradication of extreme poverty and hunger(1,3). In India, the average annual rate of decline in malnutrition has been around 0.9% since 1990. Considerably accelerated progress is needed for India to meet its MDG target of halving the percentage of underweight children by 2015(2). The World Health Organization (WHO) Global Database on Child Growth and Malnutrition concludes that the mean weights in developing countries start to falter at about 3 months of age and decline rapidly thereafter in infancy(4). Results of the third National Family Health Survey (NFHS-3) also show that at six months of age 29.5% infants are already underweight(5). These findings highlight the need for early life interventions to prevent growth failure and consequent ill effects.

Early breastfeeding within one hour and exclusive breastfeeding for the first six months are the key interventions to achieve MDG 1 and MDG 4, which deal with reduction in child malnutrition and mortality, respectively(3,7). In India, effective implementation of these interventions is yet to be achieved. NFHS-3 data show that the initiation of breastfeeding within one hour is only 24.5% while the exclusive breastfeeding rates in children under six months is only 46.4%(5). Universalizing early and exclusive breastfeeding in the country will require a national policy and program, along with effective strategies and necessary budgetary provisions. In the ensuing sections, we explore the role of early and exclusive breastfeeding as child health strategies and evidence-based ways to universalize optimal infant and young child feeding (IYCF) practices.

WHAT ARE THE GLOBAL RECOMMENDATIONS FOR OPTIMAL IYCF PRACTICES?

The guidelines on the IYCF recommend that infants should begin breastfeeding within one hour and be exclusively breastfed for the first six months of life to achieve optimal nutrition, survival, growth and development. Thereafter, to meet their evolving nutritional requirements, they should receive appropriate and adequate complementary feeding along with continued breastfeeding for up to two years of age or beyond(8,9). Mainstreaming of optimal IYCF, inclusion of breastfeeding indicators in outcome evaluation, capacity building for

effective improvement in breastfeeding rates, breastfeeding research and building public awareness on the importance of breastfeeding are crucial parts of policies and strategies related to child nutrition, health and development. Child health programs currently do not focus adequately on improving public awareness of the importance of breastfeeding and on providing adequate knowledge and counseling skills.

The global community is committed towards accelerating the achievement of Millennium Development Goals. There is growing understanding worldwide to invest in direct interventions for exclusive breastfeeding rates to go up. The September 2007 "*Campaign to Reduce Maternal and Child Deaths*" stressed on two interventions to reduce neonatal deaths: (*i*) breastfeeding and (*ii*) treatment of sick neonates using antibiotics by trained medical workers(10). The 2006 report of the World Bank also advocates shifting emphasis of nutrition programs from directly providing food to changing the behaviors of mothers–to early initiation and exclusive breastfeeding for the first six months of life and seeking quick treatment for children's illnesses. The report emphasizes that the developing countries must increase investment in nutrition programs for speeding poverty reduction, to achieve high benefit-cost ratios, and to improve nutrition much faster than reliance on economic growth alone(11).

In its report "*A Practical Plan to Achieve the Millennium Development Goals*" the MDG Task force recommends "Neonatal Integrated Package" that includes 2 key components: neonatal care and breastfeeding education. Women to succeed in breastfeeding need accurate information during pregnancy, assistance and support at the time of birth for early initiation, counseling to maintain exclusive breastfeeding for the first 6 months, answers to their questions, solution to their problems like 'not enough milk' and breast problems such as sore nipples, mastitis and engorgement. Breastfeeding education (in all situations including HIV infection) providing correct information in simple language by a well-trained care provider will help prevent problems and help women to succeed in breastfeeding(12,13).

EVIDENCE IN FAVOUR OF BREASTFEEDING AS A CHILD HEALTH STRATEGY

Exclusive breastfeeding and child survival

In 2003, Lancet series on child survival(6) and later Lancet series on newborn survival(14) summarized that 13% to 15% of under-five deaths in resource poor countries could be prevented through achievement of 90% coverage with exclusive breastfeeding alone and an additional 6% deaths could be prevented with appropriate complementary feeding. Moreover, these interventions are level 1 intervention *i.e.* sufficient high-quality evidence of their beneficial effect is available. It sets a stage for scaling up preventable interventions to universal level. The recent Lancet series on maternal and child undernutrition(7) has evaluated the effectiveness of universal coverage of promotion of breastfeeding strategies as a public health intervention. Some observations from this review are summarized in the **Box.**

A global ecological risk assessment(15) concluded that globally, as many as 1.45 million lives (117 million years of life) are lost due to sub-optimal breastfeeding in developing countries. This study further justifies focus on nutrition interventions being mainstreamed. Another study from Bangladesh (13) described breastfeeding practices and investigated the influence of exclusive breastfeeding in early infancy on the risk of infant deaths, especially those attributable to respiratory infections (ARI) and diarrhea. It concluded that compared with exclusive breastfeeding in the first few months of life, partial or no breastfeeding was associated with a 2.23-fold higher risk of infant deaths resulting from all causes and 2.40- and 3.94-fold higher risk of deaths attributable to ARI and diarrhea, respectively. The study showed that in the study community, when exclusive breastfeeding rates at 6 months were increased from 39% to 70 %, the reduction in the infant mortality rate (IMR) was to the tune of 32% in a very short span.

Early initiation of breastfeeding prevents neonatal deaths

A study from Ghana showed an association between timing of breastfeeding and newborn survival(16).

Summary of Lancet Series on Maternal and Child Undernutrition(7)

- The relative risk for all cause mortality is 1.48 and 2.85 for predominant (breastfeeding plus water) and partial breastfeeding, respectively as compared to exclusive breastfeeding.
- The relative risk of diarrhea mortality is 2.28 and 4.62 and pneumonia mortality is 1.75 and 2.49 for predominant and partial breastfeeding, respectively as compared to exclusive breastfeeding.
- The relative risk for prevalence of diarrhea is 1.26 and 3.04, and for pneumonia is 1.79 and 2.49 for predominant and partial breastfeeding, respectively as compared to exclusive breastfeeding.
- Infectious diseases like diarrhea, pneumonia and malaria are important contributors to stunting.
- Globally, there are 2.8 million child deaths (28% of under-five deaths) and 114 million Disability Adjusted Life Years (DALYs) (27% of under five DALYs) attributable to childhood undernutrition. India alone has 0.6 million-child deaths and 24.6 million DALYs attributed to stunting.
- Even if all other nutrition risks were addressed, a substantial number of child deaths still require interventions related to breastfeeding practices.

The study showed that 22% of all neonatal deaths could be prevented if all women could initiate breastfeeding within one hour of birth. Further, an epidemiological evidence of a causal association between early breastfeeding and infection specific mortality in the newborn infants has also been documented(17). Though it is intuitively correct, this is the first time a study has demonstrated this with data on infection specific mortality. The study showed that those newborns in Ghana, who died of neonatal sepsis had 2.6-fold increase in odds of late initiation (after day 1) of breastfeeding (adjusted OR 2.61; 95% CI: 1.68, 4.04]. The risk of the infection deaths increased with increasing delay in initiation of breastfeeding from 1 hour to day 7. Additionally, partial breastfeeding during first month was associated with risk of death as a result of infectious disease (adjusted OR: 5.73; 95% CI: 2.75, 11.91) after adjusting with the effect of early breastfeeding. This means that programs that focus on early initiation of breastfeeding and exclusive breastfeeding in the neonatal period can significantly reduce the burden of infectious disease-related mortality. This is an important addition to existing scientific evidence on the role of breastfeeding in saving babies. It calls for focus on preventive approaches in saving newborn babies and reduce burden on curative health services.

Long-term effects of breastfeeding

Breastfeeding is also linked with childhood intelligence and adult health. WHO has published a systematic review to assess the association between breastfeeding and hypertension, diabetes and related indicators such as serum cholesterol, overweight and obesity(18). This meta-analysis conclusively establishes protective role of breastfeeding on obesity, diabetes, hypertension and resultant cardiovascular disease later in the life. All effects were statistically significant, but for some outcomes the magnitude of benefit was modest. A recent Indian study has found that breastfed babies have significantly higher total cholesterol and LDL-cholesterol compared to mixed fed babies in the first 6 months of life with improving HDL-cholesterol / LDL-cholesterol ratio at 6 months. High cholesterol intake in infancy may have a beneficial long-term programming effect on synthesis of cholesterol by down-regulation of hepatic enzymes(18,19).

Exclusive breastfeeding cuts down HIV transmission

Exclusive breastfeeding can cut down HIV transmission rates from HIV positive women to their offspring by half in comparison with those who practice mixed feeding. The new intervention cohort

study from South Africa, assessed the HIV-1 transmission risks and survival associated with exclusive breastfeeding and other types of infant feeding in HIV positive women. Risk of acquisition of infection at six months of age via exclusive breastfeeding was 4.04%. Breastfed infants who received some solids had 11 times higher risk of infection and if other milk or formula is given along with breastfeeding, the risk could almost double(20). The study showed that HIV free infant survival was much higher in exclusively breastfed children at 3 months.

STATUS OF POLICIES AND PLANS FOR EARLY AND EXCLUSIVE BREASTFEEDING IN INDIA

The Global Strategy adopted by the World Health Assembly (WHA) and the UNICEF Executive Board in the year 2002, calls for urgent action by all members states to develop, implement, monitor and evaluate a comprehensive policy and a plan of action on IYCF to achieve a reduction in child malnutrition and mortality(21). The assessment of the policies and programs for infant and young child feeding in India identified several gaps(22), some of which are given below:

- Lack of a national policy for IYCF consistent with global recommendations
- Lack of a national plan of action or strategy for IYCF
- Lack of any specific budgetary allocation for IYCF
- A standstill baby friendly hospital (BFHI) initiative program, waiting for revival
- Inadequate measures for maternity protection
- Inadequate emphasis on IYCF especially skills training in the pre service education curriculum of health workers
- Inadequate access to counseling services in the community during pregnancy and postnatal period
- Inadequate policy and program support for infant feeding counseling for HIV positive mothers
- Lack of a policy that addresses key issues related to IYCF during emergencies
- Lack of monitoring and evaluation components in the major IYCF programme activities

Is it feasible to improve breastfeeding rates?

Improving breastfeeding practices requires support at the family and community levels. A study done by the ‘Infant Feeding Study Group’ from India concluded that promotion of exclusive breastfeeding through existing primary healthcare services is feasible, reduces the risk of diarrhea, and does not lead to growth faltering(23). In this study, the key input was a 3-day training of frontline workers on IYCF counseling. Another multicentric study from Bolivia, Ghana and Madagascar(24) concluded that sizeable improvements in optimal breastfeeding can be achieved within a relatively rapid time by the programs using a approach that had partnerships, training, behavior change communication, and community actions. A study from Uganda, Africa revealed that training and follow up of peer counselors to support exclusive breastfeeding in the rural district was feasible. In this study, locally selected women were trained for five days on breastfeeding counseling using a structured curriculum. After training they returned to their communities and started supporting breastfeeding peers. They were able to identify common breastfeeding problems such as “insufficient breast milk”, sore nipples, breast engorgement, mastitis and poor positioning at the breast and were able to take action to establish correct positioning of the baby at the breast(25).

INTERVENTIONS REQUIRED AT COUNTRY LEVEL

India, which is striving to improve the situation of child undernutrition and child survival and wish to mainstream and integrate ‘breastfeeding education’ and support in the child health and development programs, needs to undertake following actions:

1. *National IYCF policy and a national plan of action:* It is necessary to recognize IYCF as a scientifically proven intervention to improve child nutrition status and child survival. It needs a comprehensive national policy developed in consultation with all the stakeholders. It also requires a national plan of action and adequate budgetary allocations to bridge various identified gaps in the policy and programs.

2. *Child health and development programs:* There is an urgent need to include breastfeeding counseling by appropriately trained counselors as a preventive intervention in the programs like Integrated Child Development Services (ICDS) scheme, National Rural Health Mission (NRHM), Reproductive and Child Health –2 program, and Integrated Management of Neonatal and Childhood Illness (IMNCI).

3. *Community initiatives for supporting women:* Aggressive marketing of baby food by companies can easily mislead women who don't have access to accurate information. It also causes lack of confidence among women to be able to meet the nutritional demands of their babies. The feeling of 'not enough milk' forces many mothers to resort to other milks or foods during the period of exclusive breastfeeding. The remedy lies in building their confidence, which is a skillful act. They need support during pregnancy and childbirth whether they work inside homes or outside. An empathetic and skilled health worker must support women at the time of birth to succeed in beginning breastfeeding within an hour of birth and providing prolonged skin-to-skin contact. They should also have access to counseling (one to one or group) and support to continue breastfeeding for the first 6 months. They need answers to their questions and solution to their problems like sore nipples, mastitis and engorgement. Women also need counseling for adequate complementary feeding and continued breastfeeding at completion of 6 months. Finally, if women are HIV positive, they need counseling for infant feeding options. The support to the women may be provided at different levels:

   (*a*) At village level, the community based health workers should impart counseling services after getting appropriate (at least three days) training in breastfeeding counseling. Basic curriculum of health workers must also include the breastfeeding counseling.

   (*b*) At a cluster of 5-10 villages (or maximum of 30 villages), there should be an IYCF/ breastfeeding/lactation support center managed by woman nurse adequately skilled and trained using a 7 day-course such as the one developed by Breastfeeding Promotion Network of India (BPNI)(26). The counseling specialist should be able to provide counseling in all situations including HIV positive mothers.

   (*c*) BFHI should be implemented in all hospitals. The BFHI program was initiated in our country with great hopes and expectations, but the implementation of the program lacked a strong training component. There was no monitoring and reassessment system in place. The program at the moment is standstill and requires a revival in line with new international guidelines.

4. *Pre-service curriculum strengthening for doctors and nurses:* This will help reduce the need of in-service training and improve knowledge and skill of doctors and nurses, which is seriously lacking. BPNI and a technical group of medical college teachers have developed a teaching module that can be easily integrated in undergraduate medical education without increasing the duration of teaching.

5. *Protecting breastfeeding:* The legislation, the Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act(27) is in place for last so many years, but it needs an effective implementation. There is a need to ensure that the provisions of the Act are widely disseminated among all stakeholders at all levels in a user-friendly manner. Monitoring is also needed for effective implementation of IMS Act. The IMS Act also requires further strengthening in many aspects including synchronizing it with relevant World Health Assembly resolutions about sponsorship for health workers and conflict of interest.

6. *Behavior change communication:* The objectives should be to build an enabling environment to support mothers and families and develop a communication strategy based on an assessment of local and existing feeding and caring practices with the aim of promoting positive behavior as per the IYCF guidelines.

7. *Maternity benefits:* Working mothers should be supported to achieve successful exclusive breastfeeding by ensuring effective enforcement of maternity benefit act and provisions of supportive child care services. There is a dire need to strengthen the Maternity Benefit Act so as to include maternity leave benefits for six months for all the working mothers. It includes providing leave or cash support to ensure babies and mothers stay close and provision of crèches at work places.

CONCLUSIONS

Despite breastfeeding's numerous recognized advantages, early and exclusive breastfeeding rates in most states of the India are low. There are many gaps in policy and programs related to infant and young child feeding in India. The big challenge is how to mainstream IYCF counseling and support interventions to help women to succeed both in early and exclusive breastfeeding. The rationale for supporting a major program to protect, promote and support breastfeeding action, backed by a budgetary support, is compelling for our country. Child health and development policies should urgently address this major concern.

Funding: None

Competing Interests: JDP is working with Breastfeeding Promotion Network of India (BPNI), an organization with prime objective of protecting, promoting and supporting breastfeeding.

REFERENCES

1. UNICEF. Progress for children – a report card on nutrition, 2006. Available from: URL: http://www.unicef.org/progressforchildren/2006n4/index.html. Accessed on November 3, 2008.
2. UNICEF. The State of the World's Children 2008. Available from: URL: http://www.unicef.org/sowc08. Accessed on November 3, 2008.
3. Bryce J, Terreri N, Victora CG, Mason E, Daelmans B, Bhutta ZA, *et al.* Countdown to 2015: tracking intervention coverage for child survival. Lancet 2006; 368: 1067-1076.
4. Shrimpton R, Victora CG, de Onis M, Costa Lima R, Blössner M, Oectroph D, *et al.* Worldwide timing of growth faltering: Implications for nutritional interventions. Pediatrics 2001; 107 (5): e75.
5. International Institute of Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS - 3), 2005-06: India: Mumbai:IIPS.
6. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris S S, and the Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Lancet 2003; 362: 65-71.
7. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, *et al ,* for the Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008; 371(9608): 243-260.
8. World Health Organization. What is the recommended food for children in their very early years? Available from: URL: http://www.who.int/features/qa/57/en/index.html. Accessed on November 3, 2008.
9. Ministry of Women and Child Development, Food and Nutrition Board, Government of India. National Guidelines on Infant and Young Child Feeding, Second Edition, New Delhi: 2006.
10. The Norwegian Agency for Development Cooperation (Norad). Hectic activity to save lives. Available from: URL: http://www.norad.no/default.asp?V_ITEM_ID=9310. Accessed on November 3, 2008.
11. The World Bank. Repositioning Nutrition as Central to Development - A Strategy for Large-Scale Action. Available from: URL: http://siteresources.worldbank.org/NUTRITION/Resources/281846-1131636806329/NutritionStrategy.pdf. Accessed on November 3, 2008.
12. Millennium Project. Investing in Development - A Practical Plan to Achieve the Millennium Development Goals. Available from: URL: http://www.unmillenniumproject.org/reports/index.htm. Accessed on November 3, 2008.
13. Arifeen S, Black RE, Antelman G, Baqui A, Caulfield L, Becker S. Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. Pediatrics 2001; 108: e67.
14. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de BL. Evidence-based, cost-effective

interventions: how many newborn babies can we save? Lancet 2005; 365: 977–988.

15. Lauer JA, Betran AP, Barros AJ, de Onis M. Deaths and years of life lost due to suboptimal breast-feeding among children in the developing world: a global ecological risk assessment. Public Health Nutr 2006; 9: 673-685.

16. Edmond KM, Zandoh C, Quigley MA, Amenga-Etego S, Owusu-Agyei S, Kirkwood BR. Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics 2006; 117: e380-e386.

17. Edmond KM, Kirkwood BR, Amenga-Etego S, Owusu-Agyei S, Hurt LS. Effect of early infant feeding practices on infection-specific neonatal mortality: an investigation of the causal links with observational data from rural Ghana. Am J Clin Nutr 2007; 86: 1126-1131.

18. Horta BL, Bahl R, Martines JC, Victora CG (Eds.). Evidence on the long-term effects of breastfeeding: systematic reviews and meta-analysis. World Health Organization, Geneva, 2007.

19. Harit D, Faridi MM, Aggarwal A, Sharma SB. Lipid profile of term infants on exclusive breastfeeding and mixed feeding: a comparative study. Eur J Clin Nutr2008;62(2):203-209.

20. Coovadia HM, Rollins NC, Bland RM, Little K, Coutsoudis A, Bennish ML, *et al.* Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study. Lancet 2007; 369:1107-1116.

21. WHO. Global Strategy on Infant and Young Child Feeding, 2003. World Health Organization, Geneva.

22. Dadhich JP, Gupta A (Eds). Assessment of Status of Infant and Young Child Feeding (IYCF) practice, policy and program-Achievements and Gaps – India report, 2005. Available from: URL: http://worldbreastfeedingtrends.org/report/India.pdf. Accessed on July 1, 2008.

23. Bhandari N, Bahl R, Mazumdar S, Martines J, Black RE, Bhan MK.(Infant Feeding Study Group). Effect of community-based promotion of exclusive breastfeeding on diarrhoeal illness and growth: a cluster randomised controlled trial. Lancet 2003; 361(9367): 1418-1423.

24. Quinn VJ, Guyon AB, Schubert JW, Stone-Jimenez M, Hainsworth MD, Martin LH. Improving breastfeeding practices on a broad scale at the community level: success stories from Africa and Latin America. J Hum Lact 2005; 21: 345-354.

25. Nankunda J, Tumwine JK, Soltvedt A, Semiyaga N, Ndeezi G, Tylleskär T. Community based peer counsellors for support of exclusive breastfeeding: experiences from rural Uganda. Int Breastfeed J 2006; 1: 19–26.

26. Infant and Young Child Feeding Counseling: A Training Course, The 3 in 1 course (integrated course on breastfeeding, complementary feeding and infant feeding & HIV. IBFAN Asia / BPNI; New Delhi, 2006.

27. The Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Amendment Act 2003. What has changed? Indian Pediatr 2003; 40: 747-757.