

CARE OF THE LOW BIRTHWEIGHT BABIES /NEONATAL INTENSIVE CARE

Aggrey Wasunna

Department of Paediatrics and Child Health

School of Medicine

College of Health Sciences

University of Nairobi

PO Box 19676 – 00202 NAIROBI

Phone: +254 20 271 80 45

+254 722 700 444

Email: wasunnabill@gmail.com

Aggrey.wasunna@uonbi.ac.ke

INTRODUCTION

While the under five childhood mortality rates have shown a somewhat decline in the developing countries in the last three decades, the neonatal mortality rates (NMR) have generally remained static (Darmstadt 2003; 224-25) Globally, there are about 4 million neonatal deaths out of the approximately 130 million live births annually and 99% of these deaths occur in the developing countries (Lawn, 2005:891-900). It is estimated that in the developing countries, 75% of the neonatal deaths occur in the first week and 50% happen at home. Low birth weight (LBW) babies account for nearly 80% of neonatal deaths. The rates for LBW babies are also highest in the developing countries. Unfortunately there is very poor documentation of these babies, and weights of newborn babies in general, in these countries (Victoria C 2003; 233-241; Adam T 2003; 407-420).

Millennium development Goals (MDGs) are broad global commitment to addressing general poverty and health. MDG 4 aims to reduce the under-five mortality rate by two thirds between 1990 and 2015 (Haines 2004; 394-397). To achieve this MDG, efforts in reducing the NMRs through better care of the LBW babies have to be increased (Darmstadt 2003; 224-225).

Care of the LBW, who are predominantly preterm, require a lot of resources for information and cost effective intervention measures. Paradoxically, the countries with the highest NMRs have the least of these resources (Hart JT 1971; 405-412). Any gains being made in reducing the NMRs through care of the LBW in the resource poor nations are also eroded by the HIV-AIDS scourge (Haines 2004; 394-397).

The rest of this paper outlines the care of the LBW babies in terms of

- Appropriate resuscitation /respiratory care
- Prevention of hypothermia
- Feeding
- Prevention of infection

which have been found to be cost effective strategies in reducing NMRs (See Table). The place of Neonatal Intensive Care is explored.

Table: Reduction In All Cause Neonatal Mortality/Morbidity (%) For Specified Major Risk Factor

Preconception

Folic acid supplementation IV Incidence of neural tube defects: 72% (42–87%)

Antenatal

Tetanus toxoid immunisation V 33–58%

Incidence of neonatal tetanus: 88–100%

Syphilis screening and treatment IV Prevalence-dependent¹³

Pre-eclampsia and eclampsia: prevention IV Incidence of prematurity: 34% (–1 to 57%)

(calcium supplementation) Incidence of low birthweight: 31% (–1 to 53%)

Intermittent presumptive treatment for IV 32% (–1 to 54%)

malaria PMR: 27% (1–47%) (first/second births)

Detection and treatment of asymptomatic IV Incidence of prematurity/low birthweight:

bacteriuria 40% (20–55%)

Intrapartum

Antibiotics for preterm premature rupture IV Incidence of infections: 32% (13–47%)

of membranes

Corticosteroids for preterm labour IV 40% (25–52%)

Detection and management of breech IV Perinatal/neonatal death: 71% (14–90%)

(caesarian section)

Labour surveillance (including partograph) IV Early neonatal deaths: 40%

for early diagnosis of complications

Clean delivery practices IV 58–78%

Incidence of neonatal tetanus: 55–99%

Postnatal

Resuscitation of newborn baby IV 6–42%

Breastfeeding V 55–87%

Prevention and management of hypothermia IV 18–42%¹³

Kangaroo mother care (low birthweight IV Incidence of infections: 51% (7–75%)

Adapted From Darmstadt G et al 2005; 977-988

Provision of care Algorithms is one way of improving the quality of care of LBW babies.

CARE OF LOW BIRTHWEIGHT BABIE

Appropriate Resuscitation /Respiratory Care

Perinatal asphyxia is recognized as a major cause of neonatal morbidity and mortality in the developing countries. The effects are more pronounced among the LBW babies (Ellis M et al 2000; 1229-1236; Kumar R 1995; 5-7). It is estimated that perinatal asphyxia contributes to about 23% of all neonatal deaths in Sub Saharan Africa.

The important role of appropriate neonatal resuscitation is the prevention of perinatal asphyxia is well established (Marsh D et al 2002; 572-576). The approaches to adequate resuscitation include:

- Birth preparedness
- Presence of a competent personnel for resuscitation
- Presence of basic resuscitation equipment

Recent study show that training midwives and TBAs in basic resuscitation techniques is associated with better birth care of the babies (Kumar R 1994; 59-160; Kamenir S 1997; 170-173

Treatment modalities for asphyxia which include cerebral hypothermia and rehabilitation are often costly and out of reach for most facilities in developing countries.

Prevention and Management of Hypothermia

Hypothermia in the newborn is acknowledged as a major cause of complications leading to mortality in developing countries. This is more so among the LBW babies (WHO-1993; 1997; Ellis M 1996; f42-f45)

Optimal thermal control can be achieved through

- Warming of the rooms
- Immediate drying and wrapping after birth
- Frequent feeding

- Delayed bathing
- Skin to skin contact with the mother (Kangaroo Mother Care) – KMC

Incubators, semi-permeable plastic sheeting and baby cloche are other methods of intervention
KMC has been found to provide the additional benefits of (Charpak N et al 2001; 1072-1079)

- Lower risk of nosocomial infection
- Severe illness
- Lower respiratory tract disease
- Promotion of exclusive breastfeeding
- Better weight gain

KMC is simple and easy to implement and should be widely promoted in the care of LBW babies.

Appropriate feeding and prevention of Hypoglycaemia

Hypoglycaemia is relatively common among the LBW babies. There is, however, little data on the incidence and impact of neonatal hypoglycaemia in developing countries due to paucity of laboratory backup.

Early initiation and frequent (2 to 3 hourly) feeding with breast milk is the most cost effective strategy in the prevention of hypoglycaemia. Breast milk both promotes ketogenesis and has a lower insulinogenic effect (Lucas A et al 1981; 195-200). (Hawdon JM et al 1992; 357-365). Alternative feeds can be considered in special circumstances as in presence of HIV infection. In the more preterm neonates, fortification of the breast milk where available, would be essential. Micronutrient supplementation with vitamins, and minerals promote better utilisation of feeds and faster growth.

Infection Control

Neonatal infections contribute to about 26% of mortality of these babies in sub Sahara Africa. The burden of neonatal infections in developing countries is huge, causing 8% - 80% of all neonatal deaths (Thaver D 2009; 53-59)

Approaches that have been used to prevent infection among the LBW babies include (Woods D; 2009)

- Avoiding overcrowding
- Strict policy of clean hands
- Colonising babies with maternal organisms
- Promoting breast feeding
- Skin to skin care
- Limiting use of antibiotics
 - Prophylactic
 - Therapeutic
- Clean equipment , feeds preparation
- Monitoring bacterial cultures and sensitivity
- Visiting policy and parent education
- Well trained staff

Neonatal Intensive Care (NICU)

Due to its high cost, neonatal intensive care is still out of reach for the majority of the developing countries. Where it is available, the bed capacity is extremely low and quite often not cost effective to run. Some of the difficulties faced in trying to establish NICU include

- Lack of trained personnel
- Erratic supply of consumables

- Poverty of those who need the care the most
- Initial cost of setting up a NICU
- Competing healthcare needs in each country

For the better part, NICUs are found in teaching hospitals with very little overall impact on the outcome of LBW babies.

CONCLUSION

Neonatal morbidity and mortality, particularly relating to the LBW babies is still unacceptably high in the Sub-Saharan Africa and contributes significantly to the under five mortality. Due to the widespread poverty and competing health needs in this region, a more evidence based cost effective approach to lower the NMRs involve caring for the LBW babies through preventing and managing

- Perinatal Asphyxia
- Hypothermia
- Hypoglycaemia
- Infection

Neonatal intensive care is to a large extent out of reach for most countries. Training of mid-level health personnel on appropriate care of the LBW and providing management protocols /algorithms is of great importance. Record keeping for auditing of care is paramount.

REFERENCES

1. Darmstadt G', Lawn J, Costello A
Advancing the state of the world's newborns
Bull World Health Organ. 2003; 81:224-225
2. Lawn J.E, Cousens S and Zupan J
4 million neonatal deaths: when? Where? Why?
Lancet 2005; 365:891-900
3. Victoria CG, Wagstaff A, Schellenberg JA; Gwatkind Claeson M and Esabicht JP
Applying an equality lens to Child Health and Mortality: more of the same is not enough
Lancet 2003; 362; 233-241
4. Adam T, Evans D and Koopmanschap M
Cost-effectiveness analysis: can we reduce variability in costing methods?
Int J Technol Assess Health Care 2003; 19: 407-420
5. Haines A and Cassels A
Can the millennium development goals be attained?
BMJ 2004; 329: 394-397
6. Hart JT
The Inverse care law
Lancet 1971; 1:405-412
7. Ellis M., Manadhar N, Manadhar D and Costello A
Risk factors for neonatal encephalopathy: The Kathmandu case control study
BMJ 2000; 320:1229-1236

8. Kumar R

Birth asphyxia in a rural community of North India

J Trop Pediatr 1995; 1:3-7

9. Marsh D, Darmstadt G., Moore J, Daly P, Oot D and Tinker A

Advancing newborn health and survival in developing countries: a conceptual framework

J Perinatal 2002; 22:572-576

10. Kumar R

Effect of training on resuscitation practices to traditional birth attendants

Trans R Soc Trop Med Hyg 1994; 88:159-160

11. Kamenir S

Neonatal resuscitation and newborn outcomes in Rural Kenya

J Trop. Pediatr 1997; 43:170-173

12. World Health Organization

Thermal control of the newborn: A practical Guide

Geneva Switzerland: World Health Organization: 1993

13. Ellis M, Manadhar N, Shankya U, Manadhar D, Fowdry A and Costello A

Postnatal Hypothermia and Cold Stress among newborn infants in Nepal monitored by continuous ambulatory recording

Arch Dis Child Fetal Neonatal Ed 1996: 75:f42-f45)

14. Charpak N, Ruiz-Pelaez J, Figueroa C and Charpak Y

A randomised controlled trial of Kangaroo mother care: results of follow up at 1 year of corrected age paediatrics 2001; 108:1072-1079

15. Lucas A, Boyes S, Bloom S and Aynsley-Green A

Metabolic and endocrine responses to a milk feed in six day old term infants; differences between breast and cow's milk formula feeding

Acta Paediatr 1981; 70:195-200

16. Hawdon JM, World Plati MP and Aynsley-Green A

Patterns of metabolic adaptation for preterm and term infants in the first neonatal week

Arch Dis Child 1992; 67:357-365

17. Thaver D

Burden of Neonatal Infections in Developing Countries: A Review of Evidence from

Community Based Studies

Pediatr Infect Dis J 2009; 28:53-59

18. Woods D

www.EBHealthcare.com Downloaded Oct 9 2009

19 Darmstadt G, Bhutta Z A Cousens S, Adam T, Walker N, de Bernis L

Evidence-based, Cost-effective Interventions: How Many Newborn Babies Can We Save

Lancet 2005; 365: 977-988