

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



HADITH

**THE UPPER HAND IS
BETTER THAN THE
LOWER HAND, AND THE
LOWER HAND IS THE
BEGGING HAND. (Bukhari /
Muslim)**

MORTALITY IN INFANCY.....

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**PROF DR ABIDA SULTANA
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OBJECTIVES OF THE SESSION

At the end of this session, students will be able to;

Understand the different Periods in INFANCY

Describe different Mortalities in Infancy

Explain importance of IMR, PNMR, NMR.

Discuss the status of IMR and NMR in Pakistan

Enumerate the causes of IM in Pakistan

Suggest goals and discuss progress of preventive programs

Explain Preventive programs



SCENARIO IN PAKISTAN

Total Population is 150 million

5 million births per year

LBW 25-33%

IMR 74 per 1000 live births

DEFINITIONS

Child Under 5 years of age

Infants.... Under 1 year of age

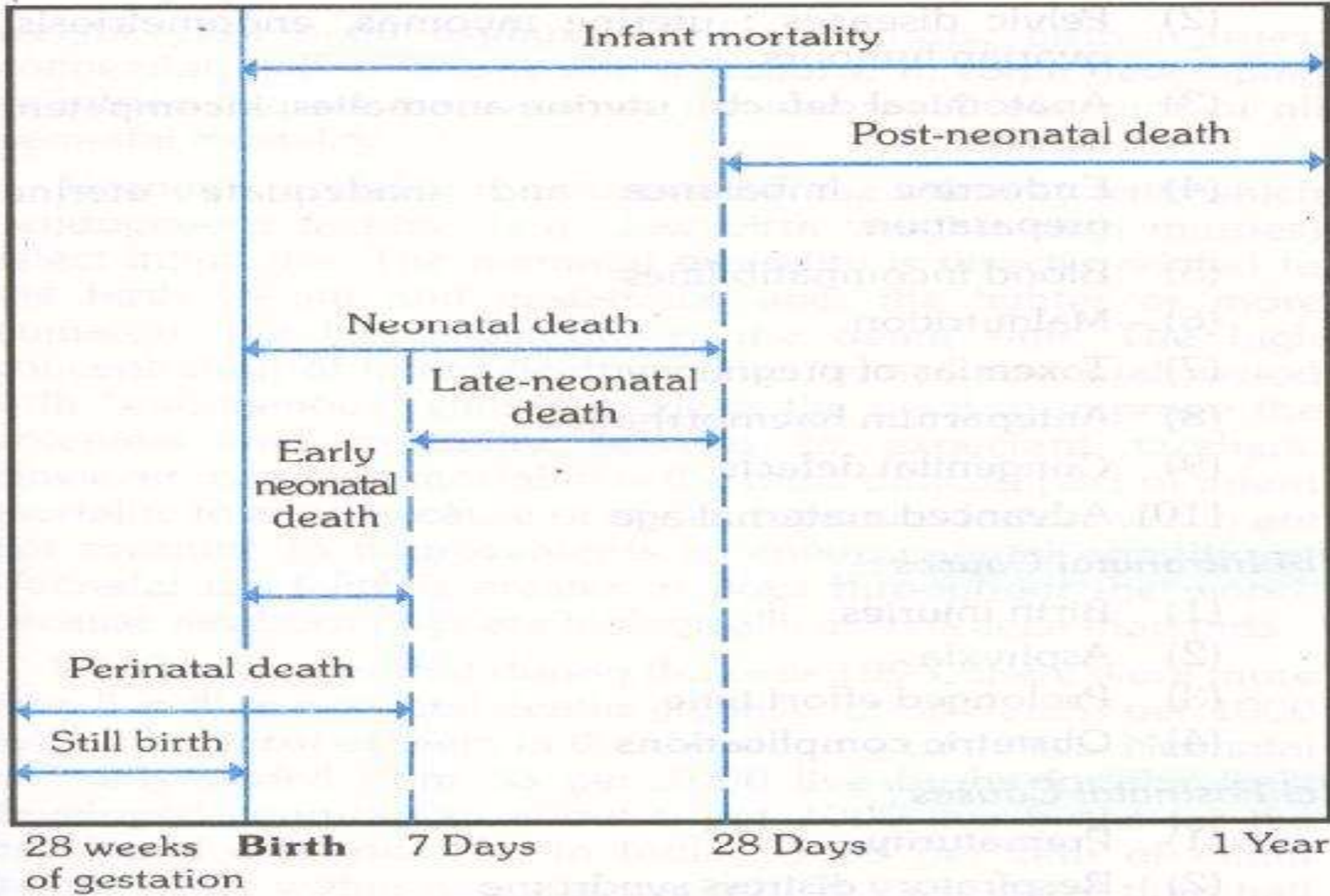
Neonates..... Up to 28 days of age

Perinatal period....28 weeks of gestation to 7 days after birth

Still Births

TIME PERIODS IN INFANCY

- 1. Perinatal period**
- 2. Neonatal Period period**
 - a. Early neonatal**
 - b. Late Neonatal period**
- 3. Post neonatal period**
- 4. Infant period**



Mortality in and around infancy

PERINATAL MORTALITY

PERINATAL PERIOD =

From 28th week of gestation to the 7th day after birth

PERINATAL MORTALITY RATE

Late foetal deaths (28 weeks of gestation and more) + early neonatal deaths (during first week after birth) in one year

$$= \frac{\text{Late foetal deaths (28 weeks of gestation and more) + early neonatal deaths (during first week after birth) in one year}}{\text{Live births in same year}} * 1000$$

DETERMINANTS OF PERINATAL MORTALITY

DETERMINANTS OF PERINATAL MORTALITY

- 1. Low maternal age (<16 years)**
- 2. High maternal age (>35 years)**
- 3. Multiple pregnancies**
- 4. Less spacing**
- 5. High parity (5th and subsequent)**
- 6. Short maternal stature (<140 cm)**
- 7. Poor past obstetric history**
- 8. Low socio-economic status**
- 9. Maternal malnutrition / anemia**
- 10. Heavy smoking (>10 cigarettes per day)**

OTHER FACTORS

- 1. Poverty**
- 2. Illiteracy**
- 3. Poor governance**
- 4. Inadequate resource allocations**
- 5. Lack of political will**
- 6. Misplaced priorities**
- 7. Poor coordination**
- 8. Quality of health care services**
- 9. Ineffective referral systems**
- 10. Lack of integration**
- 11. Lack of essential health research**

CAUSES OF PERINATAL MORTALITY

CAUSES OF PERINATAL MORTALITY

ANTENATAL CAUSES

(MATERNAL CAUSES)

- 1. General diseases**
- 2. Pelvic diseases; uterine myomas, endometriosis, ovarian tumors,**
- 3. Anatomical defects; uterine anomalies, incompetent cervix**

CAUSES OF PERINATAL MORTALITY (CONT)

- 4. Endocrine imbalance and inadequate uterine preparation**
- 5. Blood incompatibilities**
- 6. Malnutrition**
- 7. Toxemias of pregnancy**
- 8. Ante partum hemorrhages**
- 9. Congenital defects**
- 10. Advanced maternal age**

CAUSES OF PERINATAL MORTALITY (CONT)

INTRANATAL CAUSES

1. Birth injuries
2. Asphyxia
3. Prolonged effort time
4. Obstetric complications

CAUSES OF PERINATAL MORTALITY (CONT)

POSTNATAL CAUSES

1. Prematurity
2. Respiratory distress syndrome
3. Respiratory and alimentary tract infections
4. Congenital anomalies

UNKNOWN CAUSES

NEONATAL MORTALITY

NEONATAL PERIOD=

Starting at birth and ending 28 completed days after birth

NEONATAL MORTALITY RATE

Number of death of children
under 28 days of age in a year

= _____ *1000

Total live births in the same year

NEONATAL CARE



NEONATAL MORTALITY

Global burden---4 million neonatal deaths per year

Pakistan 40 neonatal deaths per 1000 live births

61% of total IMR (constant over last 30 years)

PERINEONATAL MORTALITY

- **Global burden---7 million deaths per year**
- **No accurate estimates in Pakistan because of;**
 - * Home deliveries**
 - * No data available in larger surveys**
- **68-81 deaths per 1000 live births**
(60% stillbirths)

CONCLUSIONS

IMR is extremely high in Pakistan as compared to regional countries

Current rate of improvement will not be able to achieve the target IMR by 2015.

NMR has not changed significantly over the last two decades.

Most of the causes of mortality are preventable.

HOW TO DECREASE NEONATAL DEATHS?

Or

**PRIORITY life saving INTERVENTIONS FOR NEWBORN
BASED UPON VITAL EVIDENCE**

PRIORITY LIFE SAVING INTERVENTIONS FOR NEWBORN BASED UPON VITAL EVIDENCE

Antenatal care

- ❖ **TT**
- ❖ **Nutrition (Fe, Folic acid, Iodine)**
- ❖ **Maternal infections (syphilis, Malaria)**
- ❖ **Counseling and preparation for breast feeding**
- ❖ **Early recognition of danger signs**

PRIORITY INTERVENTIONS (CONT)

During Labour

- ❖ **Observe 3 Cleans**
- ❖ **Ovoid 3 Delays**

PRIORITY INTERVENTIONS (CONT)

Immediate Newborn Care

- ❖ **Newborn resuscitation**
- ❖ **Prevention of hypothermia**
- ❖ **Prevention of hypoglycemia**
- ❖ **Prophylactic eye care**

PRIORITY INTERVENTIONS (CONT)

Post partum care for mother and newborn

Exclusive breastfeeding

Clean umbilical cord

Maintenance of temperature

Pneumonia and sepsis management

Early post partum visit

Birth spacing

NEONATAL CARE

NEONATOLOGY

A team work of multiple disciplines

Obstetric

Gynecology

Pediatrics

Preventive medicine

Social medicine

Community health services

Nursing services

CARE OF NEWBORN

Objectives of newborn care are to;

Understand the principles of care of the baby at birth.

Counsel mothers regarding appropriate cord care.

Be able to resuscitate an asphyxiated baby.

Manage common problems in neonate period.

(cont)

OBJECTIVES (CONT)

Understand nutritional requirements in the newborn and the importance of exclusive breast feeding.

Examine and appropriately manage a low birth weight baby.

Describe the immunization schedule for the child.

Understand the necessity for immunization.

WHO OBJECTIVES OF EARLY NEONATAL CARE

- * WHO Objective for 2005 was predisposition of MCH to MNCH (Maternal, Neonatal and Child Health)**
- 1. Establishment and maintenance of cardio-respiratory functions.**
- 2. Maintenance of body temperature.**
- 3. Avoidance of infection.**
- 4. Establishment of satisfactory feeding regimen.**
- 5. Early detection and treatment of congenital and acquired disorders and infections.**

IMMEDIATE NEONATAL CARE

**WASH HANDS WITH SOAP AND WATER
BEFORE HANDLING THE BABY.**

- **Cleaning the airway**
- **APGAR Score**
- **Care of the cord**
- **Care of the eyes**
- **Care of the skin**
- **Maintenance of body temperature
(warm chain)**
- **Breast feeding**

1. CLEANING THE AIRWAY

Established breathing.

Clear airway.

Head low.

Resuscitation if breathing fails to establish within one minute.

resuscitation:- suction, oxygen mask, intubations, assisted respiration.

If heart stops beating for 5 minutes, the baby is probably dead.

2. APGAR SCORE

SIGN	0	1	2
Heart Rate	Absent	<100	>100
Resp effort	Absent	Slow	Good cry
Muscle tone	Flaccid	Some flexion	Active movement
Reflexes	No	Grimace*	Cry
Colour	Blue, pale	Body pink Ex. Blue	Complete pink
Total 10	0-3	4-7	7-10
	Severe	Mild	No
*skewed, pulled		depression	depression depression

3. CARE OF CORD

Cut with sterile blade or knife.

Cut when it has stopped pulsating to provide 10ml of extra blood from mother.

Tie at least two knots or use plastic cord clamp.

Apply no antiseptic to the cord stump.

Keep the stump clean and dry.

It dries and shrivels up and separates by aseptic necrosis in 5-8 days.

4. CARE OF THE EYES

Clean with sterile wet swabs before the opening of eyes.

Freshly prepared silver nitrate solution (1 %) to prevent gonococcal conjunctivitis, or apply tetracycline

1 % ointment.

Any discharge from the eyes of newborn is pathological.

5. CARE OF THE SKIN

The first bath **may be delayed for 12-24 hours** to avoid cooling.

Should be bathed by nursing staff.

Use soap and warm water to remove meconium and blood clots.

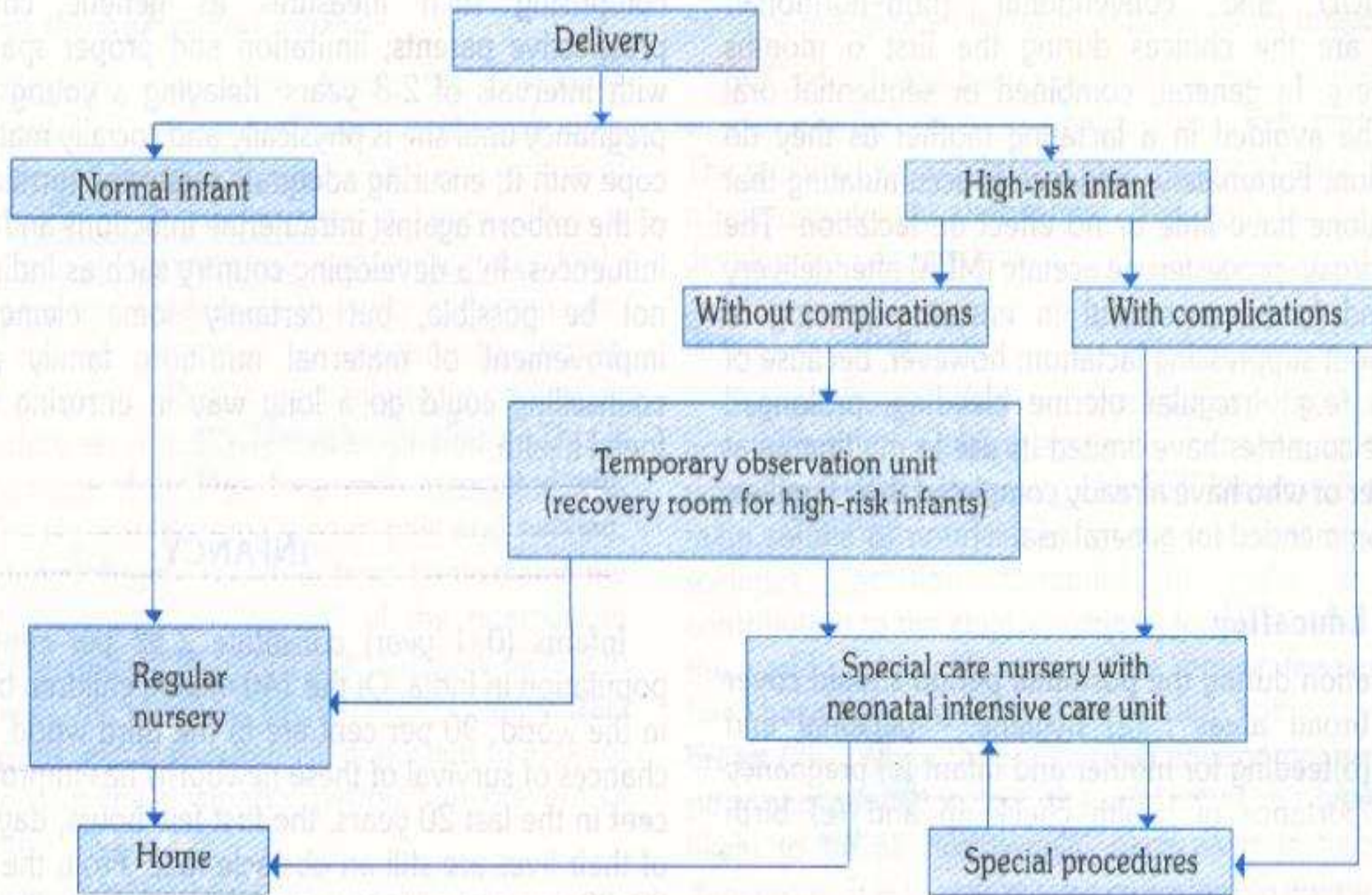
Oil massage is acceptable provided baby does not become cold.

No reason to rub the vernix off the baby's skin as it protects against infections.

6. PREVENT HYPOTHERMIA

Warm chain: immediately after birth → Remove wet towels → quickly dried with a clean dry cloth → wrapped in dry warm cloth → given to mother for breast feeding (skin to skin contact).

Normal temperature of baby is maintained around 36.9 deg C (98.6 F)



Flow Chart of Optimum Newborn Care

THANK U

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HADITH OF TODAY

Actions are judged by intentions. Everyone will be judged according to his intentions.....(Bukhari / Muslim)

MORTALITY IN INFANCY.....

2

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CONGENITAL INFECTIONS IN NEWBORN

1. NEONATAL TETANUS

Vaccination of pregnant woman

Sero-Vaccination of newborn in case of at-risk delivery (passive vaccination)

2. HBV POSITIVE MOTHER

Within 12 hours of birth

2 ml of specific anti HBs gamma globulin

0.5 ml of anti-hepatitis B vaccine IM

3 Boosters, 1 and 2 months and 1 year

CONGENITAL INFECTIONS OF NEWBORN (CONT)

3. HIV POSITIVE MOTHER

No prevention is available for newborn

4. CONGENITAL SYPHILIS

2.4 to 4.8 million Units of Benzathine Penicillin i/m

REASONS OF FAILURE (TO DECREASE IM)

The millennium project report

- ❖ Governance failures/lack of political commitment
- ❖ Poverty trap
- ❖ Poverty pockets
- ❖ Specific areas of policy neglect

GAPS

Maternal newborn care

- ❖ **First level care for all mothers and children**
- ❖ **Back up cover for only 7% of mothers and 9-15% of newborns**

Human resource development, facility development

Financial input estimates.

CLASSIFICATION OF NEWBORNS



CLASSIFICATION OF NEWBORNS

According to;

- 1. Weight**
- 2. Gestational age**
- 3. Weight and gestational age**

A NORMAL NEWBORN

Full term baby (37-41 weeks)

Weight about 3 kg (2.6 -3.6 kg)

Length of 50 cm (48 -53 cm)

A head circumference of 35 cm (33 -38 cm)

1. WEIGHT

Normal birth weight: Babies weighing more than 2.5 kg.

Low birth weight: Babies weighing less than 2.5 kg.

Very low birth weight: Babies weighing below 1.5 kg

2. GESTATION

GROUPS OF BABIES

Pre-term: Babies with gestational age of less than 37 completed weeks (<259 days)

Full term / term: Babies with gestational age between 37-41 weeks (259 to 293 days)

Post-term: Babies with gestational age of 42 weeks or more (294 days and over)

3. WEIGHT AND GESTATIONAL AGE

Appropriate for gestational age (AGA): For a given gestational age, the weight is between the 10th and 90th percentile.

Small for gestational age (SGA): For a given gestational age, the weight is below the 10th percentile.

Large for gestational age (LGA): For a given gestational age, the weight is more than the 90th percentile.

LOW BIRTH WEIGHT (L.B.W.)

Baby with birth weight less than 2.5 kg

Types

1.Pre-term babies

2.Small for dates babies

PRE-TERM BABIES

Babies born too early, before 37 weeks of gestation

Intrauterine (gestational) growth may be normal

CAUSES; Maternal, multifactorial

- 1. Multiple births**
- 2. Acute infections**
- 3. Hard physical work**
- 4. Hypertensive disorders**

TREATMENT

*** Good neonatal care**

SMALL-FOR-DATE BABIES (SMD)

May be born term or pre-term

Weight is less than 10th percentile for gestational age

Reason is retarded intrauterine growth

High risks of;

- ❖ Dying**
- ❖ Protein-energy malnutrition**
- ❖ Infections**

CAUSES OF SFD

1. THE MATERNAL FACTORS

Malnutrition

Severe anemia

Malaria

Toxaemia of pregnancy

Smoking

Poverty

Short maternal stature

Too early, too close, too many pregnancies

CAUSES OF SFD (CONT)

2. THE PLACENTAL CAUSES

Placental insufficiency

Placental abnormality

3. THE FETAL CAUSES

Foetal abnormalities

Intrauterine infections

Chromosomal abnormalities

Multiple gestation

PREVENTION OF SFD

1. DIRECT INTERVENTIONAL MEASURES (Antenatal care)

Increasing food intake

Supplementary feeding

Iron and folic acid tablets

Fortification of foods

Controlling infections

Early detection and treatment of medical disorders

PREVENTION OF SFD (CONT)

2. INDIRECT INTERVENTIONS

Family planning

Avoidance of excessive smoking

Improved sanitation measures

Improved health and nutrition of young girls

TREATMENT OF SFD BABIES

For those between 2-2.5 kg

- 1. One or two days intensive care unit**
- 2. Proper feeding**

For those under 2 kg

- 1. First class modern neonatal care in an intensive care unit comprising Incubatory care for adjusted temperature, humidity and oxygen supply**
- 2. Feeding (Extracted Breast Milk by cup & spoon)**
- 3. Prevention of infection**

CAUSES OF DEATH IN LOW BIRTH WEIGHT BABIES



CAUSES OF DEATH IN LOW BIRTH WEIGHT BABIES

- 1. Atelectasis**
- 2. Malformation**
- 3. Pulmonary haemorrhage**
- 4. Intracranial bleeding, secondary to anoxia or birth trauma**
- 5. Pneumonia**
- 6. Other infections**

STILLBIRTH RATE

Foetal deaths weighing 1000g or
more at birth/place/year

= _____ *1000

Total live + stillbirths

weighing over 1000g at birth

(weight=1000g= 28 wks of gestation)

EARLY NEONATAL MORTALITY

EARLY NEONATAL PERIOD

Starting from birth to the 7th complete day

EARLY NEONATAL MORTALITY RATE

Number of death of children

within first week of life in a given year

$$= \frac{\text{Number of death of children within first week of life in a given year}}{\text{Total live births in the same year}} * 1000$$

LATE NEONATAL MORTALITY

LATE NEONATAL PERIOD

Starting after 7 days of birth till 28th complete day

LATE NEONATAL MORTALITY RATE

Number of deaths of children after 7th day of birth till 28th day of age

= _____ *1000

Total live births in the same year

POSTNATAL MORTALITY

POSTNATAL PERIOD

After 28 days of life to under one year of age

POSTNATAL MORTALITY RATE

Number of deaths of children between 28 days and one year of age in a given year

= _____ *1000

Total live births in the same year

INFANT MORTALITY RATE

The ratio of infant deaths registered in a given year to the total number of live births registered in the same year; usually expressed as a rate per 1000 live births

Number of deaths of children less than 1 year of age in a year

$$= \frac{\text{Number of deaths of children less than 1 year of age in a year}}{\text{Number of live births in same year}} \times 1000$$

Number of live births in same year

DETERMINANTS OF INFANT MORTALITY



DETERMINANTS OF INFANT MORTALITY

BIOLOGICAL FACTORS

- 1. Birth weight**
- 2. Age of the mother**
- 3. Birth order (U-shaped curve)**
- 4. Birth spacing**
- 5. Multiple births**
- 6. Family size**

DETERMINANTS OF INFANT MORTALITY (CONT)

ECONOMIC FACTORS

CULTURAL AND SOCIAL FACTORS

- 1. Breast feeding**
- 2. Religion and cast**
- 3. Early marriages**
- 4. Sex of the child**
- 5. Quality of mothering**

DETERMINANTS OF INFANT MORTALITY (CONT)

- 6. Maternal education**
- 7. Quality of health care**
- 8. Broken families**
- 9. Illegitimacy**
- 10. Brutal habits and customs**
- 11. The indigenous Dais**
- 12. Bad environmental sanitation**

PREVENTION OF INFANT MORTALITY

- 1. Antenatal care (nutrition etc)**
- 2. Natal care (avoid 3 delays, observe 3 cleans)**
- 3. Neonatal care**
- 4. Prevention of infections / immunization**
- 5. Breast feeding (cont)**

PREVENTION OF INFANT MORTALITY (CONT)

6. Growth monitoring

7. Family planning

8. Sanitation

9. Primary health care

10. Socio-economic development

11. Education

AT RISK INFANTS



AT RISK INFANTS

- 1. Birth weight less than 2.5 kg**
- 2. Twins**
- 3. Spacing less than 2 years**
- 4. Birth order 5 or more**
- 5. H/O death of more than 2 siblings during past 2 years**
- 6. Artificial feeding**

AT RISK INFANTS (CONT)

- 7. Weight below 70% of expected weight (II and III degrees of malnutrition) / PEM**
- 8. Failure to gain weight during three successive months**
- 9. Loss of weight during first two months of life**

AT RISK INFANTS (CONT)

- 10. Children with acute problems like diarrhoea, respiratory tract infections, measles, whooping cough etc**
- 11. Working mother**
- 12. One parent**
- 13. Illness of parents**

PRACTICAL WORK

Calculate Infant Mortality in 50,000 population with IMR 80/1000 and Crude Birth Rate 30/1000.

Live births in 50,000 = $30/1000 * 50,000 = 1500$

IM in 50,000 = $80/1000 * 1500 = 120$

THANK YOU

