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
   a. Early neonatal period
   b. Late Neonatal period
3. Post neonatal period
4. Infant period
Mortality in and around infancy

- Infant mortality
  - Post-neonatal death
  - Neonatal death
    - Early neonatal death
  - Late-neonatal death
- Perinatal death
- Still birth

28 weeks to Birth to 7 Days to 28 Days to 1 Year of gestation
PERINATAL MORTALITY

PERINATAL PERIOD =

From 28\textsuperscript{th} week of gestation to the 7\textsuperscript{th} 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

= \______________ \* 1000

Live births in same year
DETERMINANTS OF PERINATAL MORTALITY
MATERNAL 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

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

Delivery

- Normal infant: Regular nursery → Home
- High-risk infant:
  - Without complications: Temporary observation unit (recovery room for high-risk infants) → Regular nursery → Home
  - With complications: Special care nursery with neonatal intensive care unit → Special procedures
THANK U
HADITH OF TODAY

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

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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
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 aver)
3. WEIGHT AND GESTATIONAL AGE

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

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

Large for gestational age (LGA): For a given gestational age, the weight is more than the 90\textsuperscript{th} 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
   (Antanatal care)
   Increasing food intake
   Supplementary feeding
   Iron and folic acid tablets
   Fortification of foods
   Controlling infections
   Early detection and treatment of medical disorders
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

= ____________________________________________ *1000

Total live births in the same year

66
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
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
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 = $\frac{30}{1000} \times 50,000 = 1500$

IM in 50,000 = $\frac{80}{1000} \times 1500 = 120$
THANK YOU