MATERNAL AND CHILD HEALTH

ABSTRACT

Maternal and Child Health is the term used to describe women's health from the perspective of pregnancy, childbirth, and into the postpartum period. It is a crucial field of public health because the health of mothers and children significantly influences the well-being of entire communities and future generations. Maternal health encompasses health care throughout pregnancy, the birth process itself, and postpartum health, and seeks to reduce or prevent instances of maternal morbidity and death. Child health looks into key development phases from infancy through adolescence via immunization, nutrition, and early intervention to address health disparities. This chapter explores the critical aspects of maternal and child health (MCH), emphasizing the importance of healthcare services, socio-economic factors, and public health policies in promoting the well-being of mothers and children.

Keywords: Maternal and Child Health; MCH problems; Safe delivery; Promoting health; Referral services. Maternal Mortality Estimation Inter-Agency Group (MMEIG)

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I. INTRODUCTION

Maternal and child health is crucial side of public health focus on pregnancy, labor, postpartum period and neonatal health up to 5 years of age. Maternal deaths are unacceptably high and subject of concern world wide. According to WHO, almost 95% of all maternal deaths reported from developing countries. In 2020, it is estimated that a maternal death occurs at every two minutes [1]. In India, according to reports provided by MMEIG the annual maternal mortality rate has declined by 6.36% during the period of 2000 to 2020. However, Pregnancy and childbirth is an unimaginable joy of mother. To ensure safe motherhood & delivery, it is utmost important to be at least 4 to 5 visit of antenatal care units for monitoring maternal & child health. These units monitor fetal growth and systematically supervise the mother for preventing complications during delivery. Maternal mortality is extremely high till 2 days after childbirth. So, delivery place must be equipped with life saving modern equipments, trained professionals & hygienic conditions. It may help to reduce incidents of maternal morbidity and mortality [2,3].

Terms and Their Definitions Related to Maternal and Child Health

- **Neonate:**Child of 0 to 4 weeks
- **Infant:**Child below the age of 1 year
- **Child:**Child below 15 years of age
- **Woman of Reproductive Group:**Females belongs to 15 to 45+ age
- **Neonatal Mortality Rate:**Number of neonatal deaths per 1000 live births per year in country
- **Infant Mortality Rate:**Number of infant deaths per 1000 live birth per year in country
- **Maternal Mortality:**Death of female during pregnancy or within 6 weeks of termination of Pregnancy
- **Maternal Mortality Ratio:**Number of maternal deaths per 1000 live births in one year in country
- **Low Birth Weight:**A baby born with birth weight below 2.5 kg
- **Preschool Age Children:** Children with 1 to 4 years of age

Maternal and Child Welfare in India

Maternal and child health services were started in early 20th century (1900s). This was coordinated by MCH bureau under supervision of Indian red cross society. Initially, it was started with training of indigenous 'dai'. Lady Chelmsford was first and much interested in this work. She established All India league for MCH welfare incorporated with red cross society. She also started health schools for training of health workers in towns. Till half 20th century, the MCH services are limited to district maternity homes & conducted through trained midwives. In 1931, Madras was the first state to establish separate maternal welfare section. Later it was linked with health centers, medical institutions and come under the supervision of civil surgeons. Notable progress had been observed in saving lives of mother & infants during delivery through MCH bodies. In developed countries, these services are established to aim with reducing maternal & infant mortality. At present scenario, they are playing vital role in maternal-child health and welfare [4,5].

Milestones in MCH Care

- 1886: Establishment of training of Dias
- 1902: 1st midwifery act for safe delivery
- 1952: Family planning programme
- 1978: Expanded program on immunization
- 1985: Universal immunization programme
- 1992: Child survival & safe motherhood programme
- 1997: RCH programme phase I (15.10.1997)
- 2005: RCH programme phase II (01.04.2005)
- 2005: National rural health mission
- 2013: RMNCH+A strategy 2013
- National health mission
- 2014: India new born action plan
- 2016: Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)
- 2017: LaQshay programme
- 2021: New MTP act

Goals of MCH

- To ensure maternal and child health during& after pregnancy
- To reduce mortality (both mother & child)
- To identify complications & prevent malnutrition in mother and child
- To promote family planning services

Maternal and Child Health Development Stages

❖ Maternal Health Stage

- **Pre Pregnant Stage (Non pregnant stage):** It includes maternal reproductive period. The optimal level of maternal health is essential before pregnancy.
- **Pregnant Stage (Prenatal time):** It begins with the fusion of spermatozoa with ovum in fallopian tube.
- **Labor&Delivery Stage (Intranatal period):** Normal delivery occurs after 40 weeks of gestation period.
- **Postnatal Stage:** The period starts from the birth of infants and placental discharge. It last for 6 weeks.
- **Interconnection Period:** It states after 6 weeks of Postnatal stage.

❖ Child Health Stage

- **Early Fatal Stage:** It is early period of fetal growth starts from first 20 weeks of pregnancy. At this period fetus is not able to survive outside the uterus.
- **Late Fetal Stage:** This stage starts from 20 weeks. The delivery between 28 to 37 weeks of gestation period is called preterm delivery. Fetus born dead during this period.
- **Infancy:** This is the period from birth to first birthday characterized by rapid growth & development.
- **Preschool Stage:** The period start from first birthday of child and end with 5^{th} birthday. Child develops physically, socially, emotionally and mentally [6].

Components of Maternal and Child Health Care

❖ **For mother**

- **Preconceptional:** This is the term that refers to health outcomes before actual conception. Preconceptional services start before marriage or even before sexual maturity.

Aspects of Preconceptional Services

- **Education:** It includes education about genital hygiene, physiology of reproductive organs, family planning, planned parenthood, removal of fear, mother craft etc.
- **Informational:** Married females should be sufficiently aware of the benefits of medical supervision during pregnancy as well as facilities available in health centers before conceiving pregnancy.
- **Eugenics:** It includes the prevention of the birth of infants with genetic abnormalities like Hemophilia, Down syndrome, Turner syndrome, Klinefelter syndrome etc.

❖ **Antenatal Care:** This is the systemic supervision (examination & advice) of a woman during pregnancy. The supervision should be periodic according to need of person.

Objectives of Antenatal Care

- Proper counseling of women for regular check-ups.
- Identify high-risk pregnancies and ensure to provide special attention.
- Maintain maternal health and nutritional status during pregnancy.
- Prepare the mother physically and psychologically for delivery.
- To reduce maternal and infant mortality during delivery.
- Ensure at least three maternal visits of antenatal care. First visit at 20 weeks (as soon as pregnancy known), 2^{nd} visit at 32 weeks and 3^{rd} visit at 36 weeks of pregnancy.
- Ensure safe delivery & teach mothers about infantcare.

❖ **Natal Care:** Systemic supervision of a woman during delivery is called Natal care.

Objectives of Natal Care

- **Promote and Ensure Maternal and Fetal Health**
  - Monitor and manage maternal nutrition to prevent deficiencies.
  - Ensure the physical and mental well-being of the mother throughout pregnancy.
  - Monitor the growth and development of the fetus.
  - Identify and manage any abnormalities or risks to fetal health
- **Provide Education and Counseling**
  - Inform mothers about healthy practices, proper nutrition, and safe medications during pregnancy.
  - Prepare mothers for labor, delivery, breastfeeding, and postnatal care.
- **Reduce Maternal and Infant Mortality**
  - Plan safe deliveries, either at home with skilled birth attendants or in health facilities
  - Conduct periodic antenatal check-ups to track maternal and fetal health
- **Educate on Family Planning**
  - Discuss postpartum family planning options for future pregnancies and spacing.

5C' Rule

5C rule is essential rule to all health professionals during delivery.

C – Clean hands

C – Clean surface

C – Clean razor blade

C – Clean cord

C – Clean cord stump

For maintaining 5C rule there is a DDK kit (Disposal delivery kit) available in health care centers and labor room of hospitals. DDK contains clean cord tie, clean surgical blade, gauze and Mackintosh.

❖ **Postnatal Care:** Post Natal care includes systemic supervision of the woman after the delivery up to 72 hours in the hospital and after that in the home.

❖ **For Children**

- **Infant Care:** The care given to the child from birth to the age of 2 years i.e. the period of infancy. This period is a time of rapid growth and changes in infants.
- **School Health Services:** It is a range of programs and initiatives that aim to promote the health and safety of students and staff in educational settings.
- **Care for the Handicapped Child:** Caring for a handicapped child requires a combination of physical, emotional, and psychological support, as well as patience, understanding, and dedication.

APGAR score

APGAR is a quick assessment that is carried out on a newborn at 1 minute and 5 minutes from birth to determine the physical condition of the baby and whether or not he needs immediate medical care. It assesses five criteria: Appearance, Pulse, Grimace, Activity, and Respiration. Each criterion is scored on a scale of 0 to 2, with a maximum possible score of 10. [5, 7]

Table 1: APGAR Scoring System

Criteria	Score 0	Score 1	Score 2
Appearance (Skin Color)	Blue or pale all over	Pink body, blue extremities (acrocyanosis)	Completely pink
Pulse (Heart Rate)	Absent	Less than 100 beats per minute	100 beats per minute or more
Grimace (Reflex Response)	No response to stimulation	Grimaces or weak cry	Cries or pulls away when stimulated
Activity (Muscle Tone)	Limp	Some flexion of arms and legs	Active motion (flexed arms and legs)
Respiration (Breathing)	Absent	Weak or irregular breathing	Strong cry

Table 2: Interpretation of APGAR Scores

Total Score	Condition	Action Required
7–10	Normal	The baby is in good health; routine care is needed.
4–6	Moderately abnormal	May require medical assistance or observation.
0–3	Critically low	Immediate resuscitation or intensive care is needed.

Growth Chart

The Growth Chart, also known as the "Road to Health" chart, is a chart that plots the growth of a child in terms of physical parameters of growth. It was initially designed by David Morley and then adapted by the World Health Organization. This is a low-cost, simple method to measure the weight gain and health status of a child over a period of time.

WHO Child Growth Standards

In 1993, WHO also completed a major review on the use and interpretation of anthropometric references, which identified major deficiencies within the NCHS growth reference to show early childhood growth accurately. This was a reference applied internationally already in the late 1970s; new curves became imperative. From 1997 through 2003, there was conducted a Multicentre Growth Reference Study in Brazil, Ghana, India, Norway, Oman, and the USA. This had given the primary growth data with new growth standards. New growth standards, based on percentiles and Z-score curves for the measurements of length/height-for-age, weight-for-age, weight-for-length, weight-for-height, and BMI-for-age, were targeted for children ranging from 0-60 months. In February 2009, the new WHO Child Growth Standards (2006) were adopted by India to monitor the growth and development of young children under the National Rural Health Mission (NRHM) and the Integrated Child Development Services (ICDS) program. The standards are used for both boys and girls under 5 years of age. Another proposition on introduction is the Joint Mother and Child Protection Card where record of family identification is done along with birth particulars, pregnancy history, details regarding institutional records, Pregnancy care and deliveries are conducted, preparation for pregnancy completion including creating consciousness and enrolling in JSY during Ant Natal checkups, immunizations pertaining, remarks why special care is performed. [8]

Figure 52: WHO Growth Standards for Male

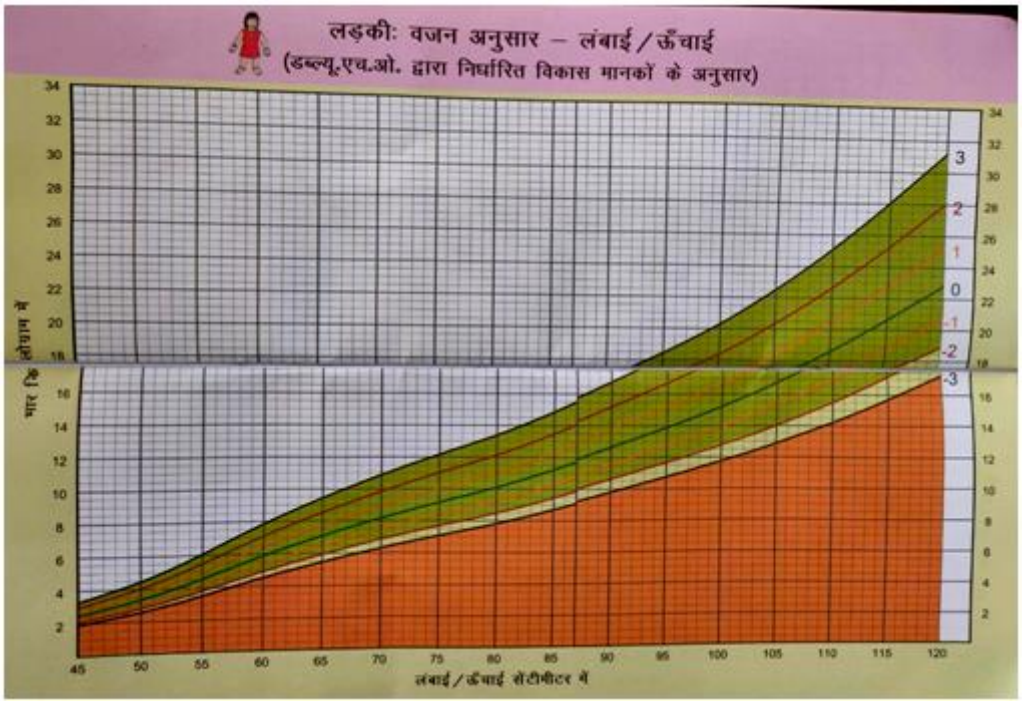

Figure 53: WHO Growth Standards for Female

Under Five Clinics

The initial five-year of life in any child forms a base for his/her growth in both the physiological and psychological development aspect. The aim of the under-five clinic is the integration of the health facilities in preventing disease, treating diseases, health monitoring, nutritional assessments, and education to enable an increased delivery of the core services.

Aims and Objectives

- Care in illness
- Preventive care
- Growth monitoring
- Family planning
- Health education

Child Health Problems

- Low birth weight
- Nutrition problems- malnutrition &anemia
- High mortality rate
- Acute respiratory tract infection
- Diarrheal diseases
- High level of school dropouts
- Child labour & child abuse
- Drug abuse
- Sexual problems
- Physical, mental & behavioural problems in street children

Disorders Associated with Maternal Mortality during Pregnancy

Here are some common complications appear during pregnancy.

1. **Anaemia:** Anaemia is one of the frequent ailments in developing countries during pregnancy. Anaemia is medical condition characterized by decrease Hb, low RBCs count and low oxygen carrying capacity of blood. The most common cause is nutritional (Iron, Vitamin B12 & folic acid deficiency) that have adverse effects on maternal and child health. Hb less than 11 gm/dl

during pregnancy is abnormal and less than 6 gm/dl associated with poor pregnancy. Premature birth, low birth weight, spontaneous abortion, fatal death etc are complications of severe Anaemia [5,9].

2. **Gestational Diabetes:** Gestational diabetes is one of the common complications characterized by hyperglycemia during pregnancy. It poses life threating risk for both mother and developing fetus. Low human placental lactogen, hypertension, low HDL (less than 35 mg/dL), polycystic ovarian syndrome, low physical activity, obesity etc are high risk factors for gestational diabetes [10].

3. **Urinary Tract Infection:** Puerperal pyrexia can often be caused by urinary tract infections, which occur in about 1-5% of all deliveries. This infection may result from various factors, including the recurrence of a previous cystitis or pyelitis, or an infection that is contracted for the first time during the puerperium.

4. **Puerperal Sepsis:** Puerperal sepsis is a genital tract infection that arises as a complication after childbirth. In recent years, its occurrence has significantly decreased, primarily because of improvements in obstetric practices and the widespread use of advanced antibiotics.

5. **Breast Engorgement:** Excessive venous and lymphatic swelling preceding the onset of lactation causes breast engorgement. This swelling, in turn, obstructs the flow of milk from the lacteal system. It is seen more commonly in primiparous women and those with less elastic breast tissue. Engorgement followed by infection may result in puerperal pyrexia.

6. **Puerperal Venous Thrombosis:** Thrombosis in the leg and pelvic veins is a common complication during the puerperium, particularly in Western countries. However, its occurrence is relatively lower in Asian and African regions.

7. **Vaginal Discharge:** Pregnancy leads physiologic increase in vaginal discharge due to heightened vascularity and hyperestrogenism. Characteristically, the discharge is mucoid and nonirritating. Microscopically, it usually contains a predominance of cornified squamous cells and a few pus cells.

8. **MoniliaVaginitis:** Candida albicans vaginitis also occurs more frequently during pregnancy. The acidic pH of vaginal secretions and high sugar in the urine favor this fungus. [5,11].

Calculation of Expected Date of Delivery

This is calculated by Naegle's formula which is based on the first day of last menstrual cycle. According to this formula – Expected date of neonatal birth calculated by adding 7 days in first day of menstrual cycle and subtracting 3 months from the month of menstrual cycle. Thus, overall process involves record of menstrual period and female is asked to name of 1st day of her last menstrual cycle.

Expected date of delivery = LMC – 3 months + 7 days

Where LMC is last menstrual cycle.

For example, if Last menstrual cycle is 6 July, then expected date of delivery will be 13 April. [12]

Naegle's formula can also be express as-

Expected date of delivery = LMC + 9 Months + 7 days

Breast Feeding

Breastfeeding should begin within the first hour after birth, rather than being delayed, as early initiation helps strengthen the mother-child bond. Breast milk is the optimal source of nutrition for infants, and no supplementary food is necessary until the baby reaches six months of age. On average, Indian mothers produce 450–600 mL of milk daily, with a protein content of 1.1 grams per 100 mL. Human milk provides approximately 70 kcal of energy per 100 mL.

Advantages

- It is safe, clean, hygienic, cheap and available to the infants at a correct temperature.
- It is easily digested &fully meets the nutritional requirement of infants in the first few months of life.
- It contains antimicrobial factor macrophages, secretory IgA etc. which provide protection against different diseases.
- It helps reduce the risk of obesity in babies.
- It prevents malnutrition and contributes to lower infant mortality rrates
- It supports family planning by prolonging the natural period of infertility.
- Certain fatty acids in breast milk contribute to higher intelligence and improved visual development in infants.[8].

Artificial Feeding

If breast feeding is not enough to infant, then artificial feeding is required. It includes use of cow milk, milk powder, acid milk, skimmed milk, and condensed milk. The quantity depends on individual child and varies different time. Its dilution depends on age of infants.

Table 3: Frequency of Artificial Feeding with Age

Age of Infant	Artificial Feeding	Frequency
0 to 2 weeks	1:1 (1 part of cow milk to 1 part of water)	At every 3 hours
2 to 4 weeks	2:1 (2 part of milk to 1 part of water)	At every 3 hours
1 to 3 months	3:1 (3 part of milk to 1 part of water)	At 4 hours
3 to 6 months	Undiluted milk	At 4 hours

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