

Preterm Birth and its Management

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Abstract

Preterm birth or premature birth is a common cause of morbidity and mortality in newborn babies. This article describes the risk factors of preterm birth complication and outcome, and the management of preterm birth. Better understanding of the causes and mechanisms will advance the development of the solutions to management of preterm birth.

Introduction

The World Health Organization (WHO) has defined preterm birth as delivery before 37 completed weeks of gestation or 259 days of gestation (WHO 1992). An estimated 15 million babies are born too early every year. That is more than one out of 10 babies. Over one million children die each year due to complications of preterm birth. Many survivors face a lifetime disability, including learning disabilities and visual and hearing problems. In almost all countries with reliable data, preterm birth rates are increasing. Globally, prematurity is the leading cause of newborn deaths after pneumonia in children under the age of five (WHO, 2012). Worldwide, around 10% of babies are born preterm, and of these 85% are born in Africa. In Europe and many developed countries the preterm birth rate is generally 5-9% and USA it has risen to 12-13% in the last decades (CDC Features, 2011). Three obstetric events precede preterm birth: namely preterm labor, premature rupture of membranes, and induced labour. About 40–45% of the preterm births follow preterm labor and 25-30% preterm births occur premature rupture of membranes. The remainder 30–35% is preterm births that are induced for obstetrical reasons.

Obstetricians may have to deliver the baby preterm because of a deteriorating intrauterine environment or significant endangerment of maternal health (Goldenberg et al., 2008). Infants born preterm are at greater risk than infants born at term for mortality and a variety of health and developmental problems. Complications include acute respiratory, gastrointestinal, immunologic, central nervous system, hearing and vision problems as well as long term motor, cognitive, visual, hearing, behavioral, social, emotional, and growth problem (Richard & Behrman, 2007). The rate of preterm birth in India is approximately 21% (Singh & Singh, 2007).

In Nepal incidence of preterm birth is 19.5%. Common risk factor associated with preterm birth were inadequate antenatal check up (52%), maternal age < 20 years (34.7%), antepartum haemorrhage (23.4%), pregnancy induced hypertension (13.1%), (Shrestha, 2010). Several factors have contributed to the overall rise in the incidence of preterm birth. These factors include increasing rates of multiple births, greater use of assisted reproduction techniques, such as drugs that induce ovulation and vitro fertilization, and more obstetric intervention.

Causes and Risk Factors of Preterm Birth

Most preterm birth happen spontaneously but some are due to early induction of labour or caesarean birth, whether for medical or non medical reasons. Common causes of preterm birth include multiple pregnancies, infection and chronic condition such as diabetes and high blood pressure, however often no cause is identified. There is also a genetic influence.

Approximately 50% of preterm births occur spontaneously following the premature onset of labor, 40% are medically induced deliveries due to medical condition endangering the mother and / or fetus, and 10% of preterm births are associated with the premature rupture of fetal membranes leading to either a spontaneously or medically induced delivery which consequently are the causes for a preterm delivery.

Approximately 45-50% preterm birth are idiopathic, 30% are related to preterm rupture of membranes and another 15- 20% are attributed to medically indicated or elective preterm deliveries (Pennell et al., 2007).

The causes of preterm birth are not completely understood. Even if a woman does everything right during pregnancy. In fact, the cause of 50% of preterm births is never determined. Causal factors linked to preterm birth include biological and genetic determinants, present pregnancy characteristics, pregnancy history, maternal demographic characteristics (age, socioeconomic status, and education level), maternal nutritional and psychological status, fetal characteristics, and environmental factors. Overall, rise in the incidence of preterm birth are: previous preterm birth, early induction of labour due to fetal and/or maternal condition, abnormalities of the mothers reproductive system (intrauterine septum, premature cervical incompetence), low socioeconomic level, unexplained vaginal bleeding after 20 weeks of pregnancy, maternal illnesses (kidney disease, diabetes, heart disease, endocrine disorders, malaria) , bacterial vaginosis, intrauterine infection, non genital tract infection, complications of pregnancy (preeclampsia, hypertension) , uterine over distention, close space pregnancies, no prenatal care, smoking, drinking alcohol, using illegal drugs, domestic violence including physical, sexual or emotional abuse, low income, long standing working hours with long periods of standing, lack of social support, poor nutritional status, high level of stress, physical environment (lead paint, crowding and pollution), infertility treatments which often in twins and triplets who are more

likely to be born preterm.

Complication/ Outcome of Prematurity

Generally, infants born preterm are at greater risk than infants born at term for mortality and variety of health and developmental problems. Although the mortality rate for preterm infants and the gestational age specific mortality rate have dramatically improved over the last 3- 4 decades, infants born preterm remain vulnerable to many complications, including respiratory distress syndrome, chronic lung disease, necrotizing enterocolitis, jaundice, anaemia, cardiovascular disorder, hearing and vision problems, neurological insult. The greatest risk of mortality and morbidity is for those infants born at the earliest gestational ages. However, those infants born nearer to term represent the grates number of infants born preterm and also experience more complications than infants born at term (Richard & Behrman, 2007). In general, the more immature the preterm infant, the greater the degree of life support that is needed and the longer the stay required in a neonatal intensive care.

Prevention of Preterm Birth

Preconceptional

- Raising public and professional awareness about scope of the problem and its significance as the major contributor to infant mortality is important to reduce avoidable risk factors. Preconceptional care is extremely important, especially for women who have delivered preterm birth.
- Identification of high risk factors is done by detailed evaluation of medical, obstetric, family and personal history. There is a need to reduce repeated uterine instrumentation and to avoid risky choices in infertility treatments.
- Preconceptional intake of folic acid supplementation 4 mg a day starting 4 weeks prior to conception upto 12 weeks of pregnancy is recommended to reduce

- birth defects.
- Preexisting chronic diseases (hypertension, diabetes, epilepsy) are stabilized in an optimal state by early intervention before pregnancy.
- Reducing existing risk factors, patient with certain uterine anomalies may have a surgical correction ie removal of a uterine septum.
- Screening for asymptomatic bacteriuria followed by appropriate reduction of pyelonephritis reduces the risk of preterm birth.
- Improve the methods of identifying and treating women at risk for preterm labour.
- Encourage the use of ultrasound early in pregnancy to establish gestation age.

During Pregnancy

- Self care methods to reduce the risk of preterm birth include proper nutrition, avoiding stress, seeking appropriate medical care, avoiding infections, and the control of preterm birth risk factors eg working long hours while standing on feet, carbon monoxide exposure, domestic abuse and other factors (Wikipedia, 2012).
- Bed rest usually by lying on the left side. Women should try to reach a healthy weight before pregnancy and during pregnancy.
- Infections like yeast, bacterial vaginosis, etc can all cause premature labour. Any symptoms of a vaginal infection should be checked and treated if necessary. It can help diminish the risk of premature rupture of the membranes and premature contractions.
- Staying well hydrated can also help to prevent premature contractions; this is particularly true in the summer months. Getting eight glasses of fluid a day, (more if women's are exercising or it's very hot). Dehydration can raise the concentration of oxytocin in the blood thus causing contractions.
- Regular prenatal appointments, with doctor or midwife can help to screen risk of preterm labor and treat it as early as possible if signs of premature labour are developed.
- Maintaining healthy nutrition before and during pregnancy is important.
- Make life style changes. Be sure to get enough rest and relaxation during pregnancy. In addition, certain life style changes may be necessary, such as avoiding smoking, alcohol and illicit drugs.
- Better defining the problem of preterm birth, including the use of ultrasound in the first trimester to accurately establish gestational age. Be sure about the gestational age before induction.
- Progesterone given in the form of 17 – hydroxyprogesterone caproate often relaxes the uterine musculature, maintains cervical length, and has anti – inflammatory properties.
- Cervical Cerclage: Cervical Cerclage is a surgical intervention that places a suture around the cervix to prevent its shortening and widening, and those with certain medical problem can be helped by optimizing medical therapies prior to conception. Instead of prophylactic cerclage, women at risk can be monitored during pregnancy by sonography, and when shortening of the cervix is observed, the cerclage can be performed.

Management of Preterm Birth

Management of preterm labour consists of either tocolysis or allowing labour to progress.

- If less than 34 weeks gestation, give

corticosteroids to the mother to improve fetal lung maturity so that the incidence of respiratory distress syndrome can be minimized and chance of neonatal survival. Either betamethasone 12 mg IM, every 12 hours for two doses or dexamethasone 6 mg IM, every 12 hours, for 3 doses is given. Corticosteroids should not be used in the presence of frank infection.

- Absolute rest in bed is imposed. The patient is to lie preferably in left lateral position. The adequate hydration is maintained.
- Give a tocolytic drug (anti contraction medications) if gestation is less than 37 weeks, the cervix is less than 3 cm dilated, there is no amnionitis, preeclampsia or active bleeding and there is no fetal distress. Tocolytic drugs are salbutamol which given 10 mg in 1 liter IV fluids. Start IV infusion at 10 drops per minute. If contractions persist, increase infusion rate by 10 drops per minute every 30 minutes until contractions stop or maternal pulse exceeds 120 per minute. If contractions stop, maintain the same infusion rate for at least eight hours after the last contraction. Indomethacin is another drug which given 100mg loading dose by mouth or rectum. Give 25 mg every six hours for 4 hours. Alternative drugs include terbutaline, ritodrine (Bet 2- agonest drugs), and nifedipine (WHO, UNFPA, UNICEF and World Bank, 2000).
- Monitor maternal and fetal condition (pulse, blood pressure, signs of respiratory distress, uterine contractions, loss of amniotic fluid or blood, fetal heart rate fluid balance etc).
- Allow labour to progress if gestation is more than 37 weeks; the cervix is more than 3cm dilated; there is active bleeding; the fetus is distressed, dead or has an anomaly incompatible with survival; there is amnionitis or pre- eclampsia (WHO, UNFPA, UNICEF & World Bank, 2000).

Remember

Premature infants are usually cared for in a Neonatal Intensive Care Unit (NICU). In the NICU, premature babies are kept under radiant warmers or in incubator. In developing countries where advanced equipment and even electricity may not available, simple measures such as kangaroo care, encouraging breast feeding, and basic infection control measure can significantly reduced preterm morbidity and mortality.

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