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PREMATURE LABOUR

Dr.(Mrs)Sathiyalatha Sarathi, Vice Principal & HOD Department of OBG Nursing,Sree Balaji College of Nursing, Chrompet , Chennai – 44.

Abstract:

Premature labour occurs when regular contractions result in the opening of your cervix after week 20 and before week 37 of pregnancy. Premature labour can result in premature birth. The earlier premature birth happens, the greater the health risks for your baby. Many premature babies (preemies) need special care in the neonatal intensive care unit. Preemies can also have long-term mental and physical disabilities. The specific cause of premature labour often isn't clear. Certain risk factors might increase the chance of premature labour, but premature labour can also occur in pregnant women with no known risk factors.

Keywords:

Decidual haemorrhage, Birth asphyxia, Perinatal asphyxia, Persistent pulmonary hypertension , Meconium aspiration syndrome.

Introduction

Preterm is defined as babies born alive before 37 weeks of pregnancy are completed. There are sub-categories of preterm birth, based on gestational age:

- **extremely preterm (less than 28 weeks)**
- **very preterm (28 to 32 weeks)**
- **moderate to late preterm (32 to 37 weeks).**

Babies may be born preterm because of spontaneous preterm labour or because there is a medical indication to plan an induction of labour or caesarean birth early.

An estimated 15 million babies are born too early every year. That is more than 1 in 10 babies. Approximately 1 million children die each year due to complications of preterm birth . Many survivors face a lifetime of disability, including learning disabilities and visual and hearing problems.

Globally, prematurity is the leading cause of death in children under the age of 5 years. Inequalities in survival rates around the world are stark. In low-income settings, half of the babies born at or below 32 weeks (2 months early) die due to a lack of feasible, cost-effective care such as warmth, breastfeeding support and basic care for infections and breathing difficulties. In high-income countries, almost all these

babies survive. Suboptimal use of technology in middle-income settings is causing an increased burden of disability among preterm babies who survive the neonatal period.

Causes of Premature labour

Preterm birth occurs for a variety of reasons. The causes of premature labour includes multiple pregnancies, infections, and chronic conditions such as diabetes and high blood pressure; however, often no cause is identified. There could also be a genetic influence.

Risk factors for Premature labour

Unmodifiable risk factors include a shortened cervix (less than 25 mm before 28 weeks' gestation) and a history of preterm delivery. Behavioural risk factors include low maternal pre-pregnancy body mass index (19.8 kg per m^2 or less), maternal smoking, substance abuse, and a short pregnancy interval (less than 18 months between pregnancies).

A history of cervical conization or a loop electrosurgical excision procedure of the cervical transformation zone also increases the risk of preterm delivery. Infections of the urinary and genital tracts and periodontal diseases have been associated with premature labour.

Figure 1: Preterm baby

Diagnosis

Identification of the symptoms of preterm labour will help ensure that the patient can be evaluated, diagnosed, and treated appropriately. The signs and symptoms that appear to predict preterm labour include frequent contractions (more than four per hour), cramping, pelvic pressure, excessive vaginal discharge, backache, and low back pain. A diagnosis of preterm labour should be made in a patient between 20 weeks and 36 weeks, six days of gestation if uterine contractions occur at a frequency of four per 20 minutes or eight per 60 minutes and are accompanied by one of the following: PROM, cervical dilation greater than 2 cm, effacement exceeding 50 percent, or a change in cervical dilation or effacement detected by vaginal examinations.

Treatment

Corticosteroid Therapy

Corticosteroid therapy is presently the only treatment shown to improve foetal survival when given to a woman in preterm labor between 24 and 34 weeks of gestation. Corticosteroid therapy is also beneficial in pregnant women of less than 30 to 32 weeks of gestation with premature rupture of membranes (PROM) and no evidence of chorioamnionitis. Treatment regimens include betamethasone, in a dosage of

12 mg given intramuscularly every 24 hours for two days, or dexamethasone, in a dosage of 6 mg given intramuscularly every 12 hours for two days.

Parenteral Tocolytic Therapy

Drugs used for tocolysis include magnesium sulphate, ritodrine, terbutaline, nifedipine (Adalat, Procardia) and indomethacin (Indocin). It is difficult to evaluate the efficacy of these drugs because of the inability to establish a definitive diagnosis of labour and the lack of consensus regarding the definition of successful treatment of preterm labour. However, it should be emphasized that tocolytic therapy has not been definitively shown to improve foetal outcome.

Contraindications to Tocolytics

1. Intrauterine foetal death
2. Foetal anomaly
3. Maternal bleeding with haemodynamic dysability
4. Non-reassuring foetal heart rate
5. Premature rupture of membrane
6. Chorioamnionitis

Magnesium Sulphate

Compared with beta-adrenergic agonists, magnesium sulphate is often used as a first-line therapy for tocolysis because it is highly effective and is associated with fewer side effects. Magnesium sulphate acts centrally to decrease seizures and blocks neuromuscular transmission. The mechanism for preventing uterine contraction is unknown but may be related to calcium antagonist activity. A loading dose of 4 to 6 g should be given intravenously over 15 to 30 minutes. A continuous infusion of 1 to 4 g per hour is then administrated to maintain a magnesium level between 4 and 6 mEq. The infusion is continued until 12 to 24 hours of uterine quiescence is achieved. Commonly, terbutaline, in a dosage of 2.5 to 5.0 mg, is given orally 30 minutes before discontinuing the magnesium sulphate infusion, then every two to four hours thereafter to control contractions.

Maternal Complications associated with the use of magnesium sulphates includes nausea, vomiting, hypotension, headache and the more severe effects of respiratory depression and pulmonary edema. Because magnesium sulphate crosses the placenta, fetal side effects include decreased muscle tone and lethargy. An immediate antidote to magnesium toxicity is an infusion of calcium gluconate.

Second-Line Agents for Tocolysis

Indomethacin and calcium channel blockers are second-line drugs for the treatment of preterm labour. Indomethacin, a prostaglandin inhibitor, acts by inhibiting the production of cytokines that may trigger labour. An oral dose of 25 mg every four to six hours should not be continued for longer than 48 hours because of potential foetal side effects. The use of indomethacin in the treatment of preterm labour has been associated with oligohydramnios and transient constriction of the ductus arteriosus.

Calcium channel blockers, such as nifedipine, inhibit the contraction of smooth muscle, resulting in uterine relaxation. Several small studies have shown that the efficacy of nifedipine is like that of ritodrine.

In most protocols, nifedipine is administered orally in a loading dose of 30 mg, followed by 20 mg given every four to eight hours for 24 hours, and then a maintenance dose of 10 mg every eight hours until 35 to 37 weeks of gestation or delivery.

Emerging Treatments

Oxytocin inhibitors offer a potential new therapeutic agent for the treatment of preterm labour. Although the exact mechanism of action is not known, uterine oxytocin receptors and/or oxytocin may have etiologic roles in uterine hyperactivity in women with preterm labour.

Antibiotic Therapy

Certain maternal infections, such as those previously noted, play a potential etiologic role in preterm labour. Therefore, women with sexually transmitted diseases, urinary tract infections, severe respiratory infections and vaginitis should be treated appropriately. Patients with intact amniotic membranes and a history of positive group B streptococcal culture are usually treated with intravenous penicillin. This approach is based on the rationale that treatment will prevent perinatal transmission, although this approach is not substantiated in the prevention of preterm labour. Pregnancy and delivery may be prolonged in women treated with erythromycin, ampicillin, and clindamycin (Cleocin).

Prevention of Preterm Delivery

- **Documenting an accurate gestational age as early as possible is of paramount importance in the diagnosis and management of preterm labour.**
- **Documentation of gestational age should include a record of the last menstrual period (LMP) in order to calculate Nägele's rule (LMP + 7 days − 3 months), the onset of quickening, the first foetal heart tones audible by Doppler ultrasound examination, and the first heart tones audible by fetoscope.**
- **In addition, an early pelvic examination and a second-trimester ultrasound examination should be performed, when appropriate.**
- **Awareness that foetal viability is directly related to gestational age will enhance patient care. At some institutions, the foetal survival rate approaches 90 percent at 24 to 27 weeks of gestation and 98 percent at 28 to 31 weeks of gestation in patients in preterm labour who are treated with tocolysis.**
- **Physicians who provide obstetric care should know the percentiles of foetal viability for their institution and should refer patients at risk for preterm labour to an institution that provides this critical care.**
- **Health care personnel, as well as emergency department and labour and delivery nurses, should also know the triage protocol for patients at risk for preterm labour.**

Other strategies to Prevent Preterm Delivery

Progesterone therapy:

In women with single gestation pregnancy and a history of spontaneous preterm delivery, antenatal progesterone therapy is the most effective strategy to decrease the risk of a recurrent preterm delivery. Progesterone supplementation is beneficial in these women starting at 16 to 24 weeks' gestation and continuing through 34 weeks' gestation intramuscularly. Vaginal progesterone can be used in women with no history of spontaneous preterm delivery if they have a cervical length of 20 mm or less before 24 weeks of gestation.

Surgical procedures:

Surgical procedure known as cervical cerclage can be performed. During this procedure, the cervix is stitched closed with strong sutures. Typically, the sutures are removed after 36 completed weeks of pregnancy. If necessary, the sutures can be removed earlier. Cervical cerclage might be recommended if you're less than 24 weeks pregnant, you have a history of early premature birth.

Management of Preterm Labour

Once the diagnosis of preterm labour is suspected, a complete history should be taken, including the patient's present symptoms, expected date of delivery, past medical history, medication use and allergies. Before the physical examination, a clean-catch or catheterized urine specimen should be obtained for urinalysis and culture. A general physical examination, including a vaginal examination using a sterile speculum, can then be performed.

After the pelvic examination is completed, the patient should be placed in the lateral recumbent position and externally monitored for foetal heart tones and contractions. If uterine contractions are present at least every 15 minutes, an intravenous bolus of 500 mL of normal saline or Ringer's lactate can be administered. This rapid intravascular expansion can diminish the contractions of an irritable uterus and help the physician differentiate this condition from preterm labour. The rate of intravenous fluid replacement can then be adjusted to 100 mL per hour.

If available, an ultrasound examination may be performed to determine the gestational age, presentation, placental location and presence of foetal anomalies.

The patient's history, physical examination, and laboratory and ultrasound findings must be thoroughly evaluated to determine whether she meets the criteria for preterm labour or is a candidate for parenteral tocolytic therapy. Several absolute and relative contraindications must be considered before initiating therapy. Such a delay increases the time that may be required for the beneficial effects of adjunctive corticosteroid therapy or for transfer to a tertiary treatment center capable of handling a preterm delivery and a premature infant. Input from the patient and her family, once they have considered the benefits and risks, is vital in the decision to initiate therapy.

Conclusion:

Preterm labour is a multifactorial condition associated with a high risk of morbidity and mortality, particularly at early gestational ages. Prevention is directed towards identification of women at risk and comprises screening and treatment for bacterial vaginosis, insertion of cerclage in appropriate women, and consideration of progesterone prophylaxis. The treatment of established preterm labour should be directed towards identifying those women in whom a delay in delivery is likely to be beneficial and those in whom it may be deleterious in terms of neonatal or infant outcome.

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