Preterm labour: Symptoms, Causes, Diagnosis and Treatment

Preterm labor is defined as the presence of uterine contractions with sufficient frequency and intensity to cause progressive cervical effacement and dilation, occurring between **20 weeks' and 37 weeks' gestation** (before the 37th week). This condition can happen with appropriately grown babies, some small for gestational age (SGA), and a few large for gestational age (LGA).

In a typical pregnancy, labor begins around **40 weeks' gestation**, requiring more than **4 contractions per hour** for cervical dilation to occur. In preterm labor, there is **appreciable cervical effacement or dilation (at least 2 cm)** without previous examinations.

Uterine contractions in preterm labor might not always be painful and can present as **abdominal tightening, lower back pain, or pelvic pressure**.

Preterm labor is a leading cause of neonatal morbidity and mortality, contributing to **25% of neonatal deaths unrelated to congenital anomalies**, occurring in **10-15% of all pregnancies**.

Causes of Preterm Labor

While the exact cause remains unclear, preterm labor is believed to be **multifactorial**, with spontaneous labor and elective causes both playing a role.

Spontaneous Causes:

- **Unknown causes** (up to 40% of cases)
- **Multiple gestation** (increased risk with higher multiples)
- **Maternal infection** (e.g., **pyelonephritis**, **chorioamnionitis**, **urinary tract infections**)
- **Premature rupture of membranes**
- **Polyhydramnios**
- **Maternal factors** (e.g., **short stature**, **age < 18 or > 35**, **low socioeconomic status**, **previous preterm labor**)
- **Uterine abnormalities** (e.g., **bicornuate uterus**, **fibroids**)
- **Cervical insufficiency** (especially after cone biopsy)
- **Substance abuse** (e.g., **alcohol**, **cigarette smoking**)

Elective Causes:

- **Hypertensive disorders** (e.g., **pre-eclampsia**, **chronic hypertension**)
- **Maternal diseases** (e.g., **renal** or **heart disease**)
- **Placental abnormalities** (e.g., **placenta previa**, **abruptio placentae**)
- **Rhesus incompatibility**
- **Fetal disorders** (e.g., **congenital abnormalities**, **intrauterine growth restriction (IUGR)**)
- **Thyrotoxicosis in the fetus**

Risk Factors Associated with Preterm Labor

Obstetric Complications:

- **Previous preterm or low birth weight infant**
- **Short pregnancy interval (< 3 months)**
- **Inadequate or excessive weight gain**
- **Previous cervical lacerations or uterine surgeries** (e.g., **C-section**)
- **Multiple pregnancy**
- **Non-Caucasian race**
- **Increased maternal age (<18 or >40)**

Medical Complications:

- **Pulmonary or systemic hypertension**
- **Renal or heart disease**
- **Infections** (e.g., **urinary tract infection**, **genital tract infections**)
- **Cigarette smoking and alcoholism**
- **Severe anemia**
- **Malnutrition or obesity**
- **Trauma or burns**

Surgical Complications:

- **Previous abdominal surgery**
- **Cervical conization or uterine surgery**

Signs and Symptoms of Preterm Labor

- **Regular uterine contractions**: More than two contractions per half-hour
- **Cervical changes**: Dilatation or effacement of at least 1 cm, or dilation ? 2 cm on admission
- **Vaginal bleeding**: Often presenting as a **bloody show**; significant bleeding requires assessment for **placenta previa** or **abruptio placentae**

Other indicators of preterm labor include:

- Blood-stained show
- Palpable uterine activity
- Engagement of presenting part
- Bulging membranes
- Rupture of membranes

Diagnostic Investigations

Laboratory tests to consider in suspected preterm labor:

- **Blood slide**: For malaria parasites, if the mother is from a malarial endemic region
- **Urine sample**: For microscopy, culture, and sensitivity (including testing for **urinary tract infections**)
- **Swabs**: For **gonorrhoea**, **Chlamydia**, and **gram stain** (from high vaginal and endocervical swabs)

Fetal fibronectin can be tested before cervical examination if preterm labor is suspected. Additional investigations may include:

- **Ultrasound**: For fetal assessment, including **biophysical profiling**, **amniotic fluid volume**, **fetal weight estimation**, and **presentation**

Treatment of Preterm Labor

Management depends on **gestational age** and the clinical presentation. The two main categories are **expectant management** and **active management**.

Goals of Management:

- Early identification of risk factors
- Timely diagnosis of preterm labor
- Evaluation of fetal well-being
- Initiation of **tocolysis** and **corticosteroids**
- Continuous monitoring of maternal and fetal status

Conservative Management:

For cervix less than 2 cm dilated, management includes:

- **Bed rest**, especially for mothers at risk of preterm labor
- **Use of sedatives** to ensure complete bed rest
- **Administration of tocolytics** (to relax the uterus)
- **Corticosteroids** (e.g., **dexamethasone** or **betamethasone**) to enhance fetal lung maturity
- **Treat underlying causes** (e.g., infections, dehydration)
- **Avoidance of strenuous activity and stress**

Active Management:

If cervical dilation exceeds 2 cm, or if fetal distress is present, the management involves:

- **Corticosteroids** to improve fetal lung development
- **Antibiotics** to prevent infection
- **Rupture of membranes** (except in **intrauterine fetal demise (IUFD)**)
- **Labor monitoring**, with **caesarean section** if necessary

Corticosteroid Administration

Corticosteroids are essential for **fetal lung maturity** and improving neonatal outcomes. The two most commonly used corticosteroids are:

- **Betamethasone**: 12 mg IM every 24 hours for two doses
- **Dexamethasone**: 6 mg IM every 12 hours for four doses

These corticosteroids should be used **before 34 weeks' gestation**, especially for fetuses with a weight between **600 g and 2500 g**. Their use is not recommended if there is an existing **infection**.

Use of Tocolytics

Tocolytics are medications that aim to **delay labor** by relaxing the uterus, providing time for fetal lung maturity and further interventions. Tocolytics are typically used to **prolong labor by 48 hours**.