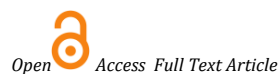
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Review Article

Preterm Birth: A Review of Its Early Diagnosis and Prevention

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Abstract

Preterm birth, a major global healthcare concern, is characterized by infants being born before completing 37 weeks of gestation. Accurate diagnosis and effective interventions are critical to managing this complex issue. This abstract provides an overview of the diagnosis and prevention of preterm birth, focusing on risk assessment, diagnostic techniques, and various interventions for mothers and newborns. The diagnostic process involves evaluating risk factors, clinical history, and the assessment of potential membrane rupture. Techniques such as speculum examination, the Nitrazine test, the Fern test, ultrasonography, and the Placental Alpha Microglobulin-1 test play vital roles in identifying membrane rupture and infection. Additional diagnostic markers include cervical ultrasonography and fetal fibronectin testing. Prevention strategies include lifestyle changes, maternal therapies, and antenatal interventions. Smoking cessation programs, low-dose aspirin, antenatal corticosteroid therapy, progesterone supplementation, magnesium sulfate, and antibiotic treatment are employed to reduce the risk of preterm birth. Cervical cerclage, another surgical intervention, is recommended in specific cases.

For preterm newborns, immediate and effective care is vital. This includes thermal care, early breastfeeding, infection prevention, and respiratory distress syndrome management. These interventions are crucial in reducing infant mortality and morbidity associated with preterm birth. Efforts to diagnose and prevent preterm birth are essential in improving the well-being of both mothers and their newborns. A comprehensive approach, combining accurate diagnosis and effective interventions, can make a significant impact in reducing the burden of preterm birth on healthcare systems and families.

Keywords: Preterm birth, infants, gestation, potential membrane rupture

INTRODUCTION:

The World Health Organization (WHO) provides a definition of preterm birth, characterizing it as the birth of infants occurring before 37 completed weeks of gestation or fewer than 259 days from the commencement of the woman's last menstrual period (LMP). These premature births can occur spontaneously or may be induced through medical interventions such as labor induction or cesarean section when necessary due to underlying medical conditions.¹

Preterm birth is a global health concern, with prematurity being the leading cause of mortality in children under 5 years of age worldwide. In low-income countries, a significant proportion of babies born before 32 weeks of gestation do not survive due to the lack of cost-effective medical care. In contrast, high-income countries achieve a much higher survival rate for preterm babies thanks to optimal healthcare services. Middle-income countries face a unique challenge, with an increased prevalence of disabilities among preterm babies who manage to survive the neonatal period.¹

The World Health Organization further classifies preterm births based on gestational age into three categories:

- Extremely preterm (<28 weeks)

- Very preterm (28–32 weeks)
- Moderate or late preterm (32–37 completed weeks of gestation)

This subdivision helps understand and address the specific needs and risks associated with preterm births at different stages of gestation.¹

EPIDEMIOLOGY:

In the year 2020, there were 13.4 million instances of preterm births, which translates to approximately one in every ten newborns.¹ Among these preterm births, around 30–35% were medically indicated, 40–45% resulted from spontaneous preterm labor, and 25–30% were associated with preterm premature rupture of membranes (PPROM). Preterm births are categorized based on gestational age, with approximately 5% occurring at less than 28 weeks (considered extreme prematurity), 15% at 28–31 weeks (classified as severe prematurity), 20% at 32–33 weeks (termed moderate prematurity), and the majority, around 60–70%, happening at 34–36 weeks (referred to as near term). It's important to note that while a significant portion of preterm births takes place in Southern Asia and sub-Saharan Africa, this issue remains a global health concern.²

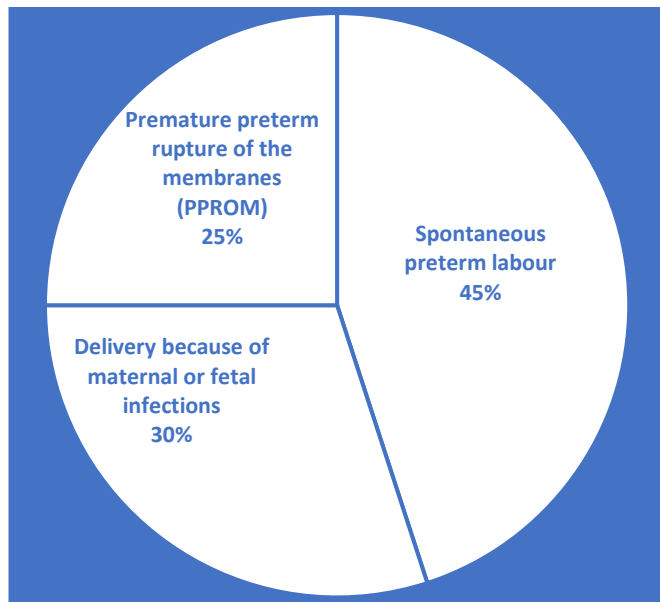


Figure 1: Significant causes of preterm birth in 2020

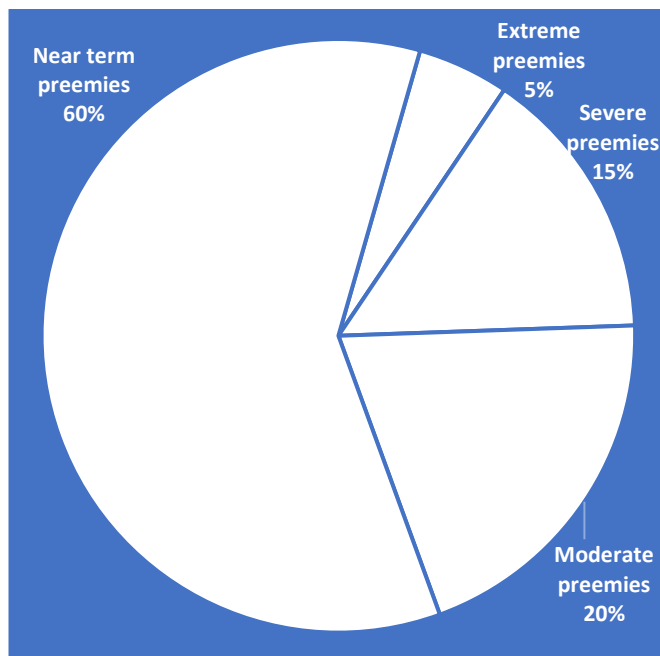


Figure 2: Incidence of preterm births at different gestational ages in 2020

SYMPTOMS:

Signs observed in expectant mothers that may indicate the possibility of preterm delivery encompass regular contractions, which could manifest every 10 minutes or more frequently, gradually intensifying into stronger and more painful contractions that coincide with changes in the cervix. Additional symptoms to be mindful of consist of pelvic pressure, cramps resembling menstrual discomfort, clear vaginal discharge, and lower back pain (though it's important to note that lower back pain can occur in regular pregnancies, back pain occurring before full term may suggest the possibility of preterm delivery).³

Furthermore, mild abdominal cramps and light vaginal bleeding are among the symptoms to watch for, but it's worth mentioning that some women experience benign false labor contractions known as Braxton Hicks contractions, which typically subside after moving around or resting.⁴

RISK FACTORS:

High-risk factors

Several factors can elevate the risk of a woman giving birth prematurely. These include a history of prior preterm deliveries, the presence of multiple gestations (twins or triplets, for example), the use of assisted reproductive technologies like In vitro fertilization (IVF) or Gamete intrafallopian transfer (GIFT), as well as specific maternal reproductive anomalies such as a shortened cervix.

Additionally, various maternal clinical conditions such as urinary tract infections, sexually transmitted infections, elevated blood pressure, obesity or being underweight, placenta previa, gestational diabetes, blood clotting issues, and vaginal infections like bacterial vaginosis and trichomoniasis can also heighten the risk of preterm birth.⁵

Other factors

African American and Indian/Alaskan mothers have a higher likelihood of giving birth to preterm babies compared to white mothers. Other risk factors include maternal age (with increased risk for mothers under 18 or over 35 years old) and a pre-pregnancy body mass index (BMI) of 19 kg/m² or lower.

Furthermore, lifestyle and environmental risk factors encompass factors like inadequate prenatal care, alcohol, and drug consumption, illicit drug use, experiences of domestic abuse (whether physical, sexual, or emotional), a lack of social support, stress, extended work hours involving prolonged standing, and exposure to specific environmental pollutants.⁵

CAUSES:

The etiology of preterm birth (PTB) can be categorized into two main groups: maternal causes and placental causes. Maternal causes include factors such as psychological and social stress, systemic inflammation, maternal complications of pregnancy (e.g., thyroid disease, eclampsia), maternal deficiencies (iron, folate, zinc), short inter-pregnancy gaps, vaginal bleeding, cervical insufficiency, abdominal surgery, multiple gestations, history of preterm labor, pre-pregnancy weight (low or high BMI), and teratogenic effects of drug abuse. These factors can contribute to the risk of preterm birth.

Placental causes include conditions such as placenta previa, placental abruption, chorioamnionitis, funisitis, umbilical cord complications (short or long cord, knots, nuchal cord), premature rupture of membranes (PROM), and maternal and fetal vascular malperfusion (MVM). Understanding these various causes is crucial for identifying risk factors and implementing preventive measures to reduce the incidence of preterm birth. Effective management and care are essential for both maternal and fetal well-being, as preterm birth can have significant health implications for both.^{2,6,7}

DIAGNOSIS:

Only 30 to 60 percent of women presenting with preterm contractions go into labor prematurely.⁸ It is essential to identify whether the patient is really in true labor or just false contractions.⁹

Assessment of clinical history

Initially, when a patient presents with fluid loss, contractions, pelvic pressure, or abdominal pain, a complete medical and obstetric history should be obtained including the estimated due date and ultrasonography. A digital vaginal examination is carried out when any of the risk factors of preterm birth is observed in the patient's history. If the delivery is imminent,

digital vaginal examination is avoided to avoid the risk of infections.⁹

Assess for rupture of membranes

Speculum examination

A sterile speculum examination is suggested to assess whether the membrane has ruptured and to collect a sample for fetal fibronectin analysis. Leakage of fluids from cervical os is observed. If the pooled fluid is not visible but there is still suspicion of membrane rupture, the patient is re-examined after some time staying in the dorsal recumbent position. A sample can be extracted and tested for the Nitrazine test and Fern test. Speculum examination is preferred since digital vaginal examination carries a risk of infection.⁸

Nitrazine test

The Nitrazine test is a diagnostic method to check if the amniotic sac has ruptured during pregnancy. It involves collecting a vaginal fluid sample during a speculum examination and placing it on Nitrazine dye paper strips. The test relies on pH levels; normal vaginal fluid has an acidic pH (around 3.5 to 4.5), while amniotic fluid is more alkaline (typically pH >6.0). If the Nitrazine strip turns blue, it suggests a possible amniotic sac rupture.

However, the test may yield false positives if there's blood, semen, or infection in the vaginal fluid, as they can also raise pH levels. So, clinical judgment and additional tests may be needed to confirm the diagnosis when uncertainties arise, considering potential confounding factors.¹⁰

Fern test

The Fern test is a diagnostic procedure used to detect the rupture of the amniotic sac during pregnancy. It involves examining vaginal fluid under a microscope. The term "Fern" comes from the fern-like pattern seen under the microscope, which is created when amniotic fluid, with its higher sodium chloride content, mixes with vaginal fluid. This pattern is a strong indication of amniotic sac rupture, suggesting that amniotic fluid is leaking. However, it's important to be aware that the presence of cervical mucus in the sample can lead to false positive results, as cervical mucus can create similar fern-like patterns. Therefore, while the Fern test is informative, it may not always provide a definitive diagnosis, and other clinical factors and tests should be considered to confirm the rupture of membranes during pregnancy.⁸

Ultrasonography

Ultrasonography is a valuable tool for identifying oligohydramnios, a condition characterized by a reduced volume of amniotic fluid around the fetus. However, it's important to note that oligohydramnios detected through ultrasonography are not sufficient on their own to confirm the rupture of the amniotic membrane. In situations where there is a strong suspicion of amniotic membrane rupture, a more specific diagnostic test can be employed to verify the presence of amniotic fluid leakage.

This diagnostic test involves introducing a small amount of indigo carmine dye (1 mL) mixed with 9 mL of normal saline into the amniotic sac through a needle, a procedure known as transabdominal amnioinfusion. If the amniotic membrane is indeed ruptured, the indigo carmine solution will mix with the amniotic fluid, causing it to appear as blue fluid leaking from the cervical opening. This visual confirmation is a reliable indicator of amniotic membrane rupture. It's worth noting, however, that this diagnostic test may not be available at all healthcare institutions. In such cases, healthcare providers rely on a combination of clinical signs, symptoms, and other

available diagnostic methods to assess the rupture of the amniotic membrane.⁸

Placental alpha microglobulin-1 test (Amnisure)

The Amnisure ROM test is a diagnostic tool that identifies the placental alpha microglobulin-1 (PAM-1) in cervicovaginal fluid, indicating a potential rupture of the amniotic membrane during pregnancy. High levels of PAM-1 in this fluid suggest a membrane rupture, leading to amniotic fluid leakage. However, in some cases, patients may test positive for PAM-1 with this test even when they don't show clinical signs of membrane rupture during a speculum examination. These instances are known as "false positives." To confirm the diagnosis, additional diagnostic methods like the nitrazine test or checking for pooling amniotic fluid are used. Combining multiple diagnostic techniques helps healthcare providers make more accurate assessments of amniotic membrane status.¹¹

Assess for infection

Screening for infections during pregnancy is crucial due to their association with preterm delivery. To assess the risk, healthcare providers should routinely obtain urine samples from pregnant patients for microscopic testing and culture to detect urinary tract infections (UTIs), including bacteriuria and pyelonephritis. Early detection and treatment of UTIs are essential in reducing the risk of preterm birth associated with these infections.

Additionally, specific screenings are recommended to address other potential infection sources. Testing for Group B Streptococcus (GBS) carriage status through rectovaginal cultures is essential to prevent complications during delivery and reduce the risk of preterm birth. Screening for sexually transmitted infections, such as gonorrhea and chlamydia, is advisable to ensure early detection and treatment when needed, safeguarding the health of both the mother and the baby. Furthermore, symptomatic patients should be screened for bacterial vaginosis (BV) and trichomoniasis, as these infections are associated with an increased risk of preterm delivery. Early diagnosis and appropriate treatment are fundamental aspects of prenatal care, promoting a healthier pregnancy and lowering the risk of preterm birth.⁸

Assessing the likelihood of true labor

Labor is defined as regular contractions of the uterine wall which is accompanied by the descent of the fetus, progressive dilation, and effacement (thinning and shortening) of the cervix. The accuracy of the clinical diagnosis increases when,

- At least 6 contractions per hour are observed
- Cervix is dilated to at least 3.0 cm
- Effacement is at least 80 percent
- Ruptured membrane
- Vaginal bleeding

But some patients may not present all of these signs, in those cases, Fetal fibronectin testing and cervical ultrasonography are carried out to determine the likelihood of preterm delivery.⁸

Cervical Ultrasonography in Symptomatic Women:

Depending on the patient tested (symptomatic versus asymptomatic) and the objective of the research (accurate identification of preterm labor in symptomatic women versus prediction of preterm delivery in asymptomatic outpatients), studies using transvaginal cervical sonography have found varying thresholds.

When cervical dilation is measured at fewer than 34 weeks and is at least 2 or 3 cm, the patient is quite likely to give birth prematurely. Transvaginal ultrasound results showing a short cervix are another sign. About 35 and 48 millimeters is considered normal cervical length. A cervical length of 25mm during 16–24 weeks of gestation is the definition of a short cervix. Notably, a transvaginal ultrasound can assist in determining if cervical effacement is the result of active labor or cervical insufficiency.

The ideal criterion to rule out a diagnosis of preterm labor in symptomatic women is 30 mm. In this situation, a cervical length of 18 to 20 mm offers the most positive predictive value. A cervical length of less than 20 mm may not necessarily indicate the presence of preterm labor, but if the examination is done properly, a length of more than 30 mm consistently precludes preterm labor since cervical effacement develops slowly and frequently precedes clinically visible preterm labor.¹²

Falsely lengthy measures can result from using transabdominal sonography, applying too much pressure to the vaginal probe, and not emptying the mother's bladder, all of which should be avoided. Transabdominal imaging of the cervix requires at least some urine in the mother's bladder, which has an unexpected impact on the measured length of the cervix, hence transvaginal scans are preferable.¹²

Foetal Fibronectin in Symptomatic Women:

A higher chance of giving birth before 34 weeks and within 7–14 days of the test has been linked to a positive fibronectin test

(50 ng/mL or more) in a patient with symptoms indicative of premature labor.

Although it is a particular but not sensitive test, the release of fetal fibronectin caused by the breakdown of the cervical extracellular matrix is another sign of premature labor. Positive results may not always imply early membrane rupture, while a negative result is strongly suggestive of an unbroken membrane.¹²

When the following conditions exist, a test for fibronectin would seem to be helpful for women experiencing symptoms:

- Between 24 and 34 weeks of gestation, symptoms start to appear.
- The cervical dilation is less than 3 cm, and the membranes are unharmed.
- Results are provided quickly (often within 6 to 8 hours, albeit longer at distant sites).
- The practitioner is prepared to accept a poor outcome by delaying therapy.¹²

Other biochemical markers:

There are several other biochemical markers apart from fibronectin to predict preterm birth like cytokines (Interleukin-6), Estradiol-17 β , Progesterone, and Estriol. Among the biochemical markers, the presence of fetal fibronectin in cervicovaginal secretions is the most promising one.¹²

QUESTIONS	ASSESSMENT
Is the gestational age less than 37 weeks?	Verify dates using clinical history and ultrasonography
Are the membranes ruptured?	<ul style="list-style-type: none"> ● History of leaking fluid: observed leakage or pooling of fluid from cervical os on sterile speculum examination ● Positive nitrazine test result ● Arborization or ferning of fluid on microscopy ● Positive amniotic protein test result (e.g., placental alpha microglobulin-1 [Amnisure]) ● Ultrasound assessment shows low amniotic fluid ● Ultrasound-guided transabdominal instillation of indigo carmine dye into the amniotic sac, if available, shows dye outside of the amniotic sac
Is the patient in labor?	Observe for regular contractions accompanied by progressive dilation and cervical effacement
Is there an infection?	Evaluate for group B streptococcus carrier status, urinary tract infection, bacterial vaginosis, and sexually transmitted infections (trichomoniasis, gonorrhea, or chlamydia); treat as appropriate
What is the likelihood that the patient will deliver prematurely?	Negative fetal fibronectin test results and cervical length of at least 3cm on ultrasonography have a low likelihood of delivery within 14 days

*Adapted from reference 8

Figure 3: Method of assessment in patients with premature contractions

PREVENTION

The reduction of infant mortality and morbidity stemming from preterm birth can be achieved through various interventions provided to expectant mothers before or during pregnancy and to preterm newborns immediately after birth. For instance, smoking cessation programs can be employed to diminish the risk of preterm birth among all pregnant women, while women with existing risk factors can benefit from treatments like progesterone drugs and cervical cerclage to lower their risk. However, the most effective set of maternal therapies focuses on improving preterm infant outcomes in cases where preterm delivery is inevitable. These therapies include the administration of prenatal corticosteroids, magnesium sulfate, and antibacterial prophylaxis.¹³

Antenatal interventions that have proven effective include the use of antenatal steroids to expedite fetal lung maturation and the prophylactic use of intrapartum antibiotics to reduce neonatal sepsis, particularly for covering group B streptococcus. Additionally, timely management of intrapartum fetal hypoxia and preventive measures play a crucial role in enhancing outcomes.

Effective neonatal care protocols encompass various components such as exogenous surfactant treatment, diverse mechanical breathing techniques, appropriate use of antibiotics, vigilant management of fluid and electrolyte balance, and comprehensive newborn care strategies. Preterm delivery appears to be made more likely by protein supplementation during pregnancy.¹³

Interventions to prevent preterm birth:

- **Low-dose aspirin:**

The ASPIRIN study, sponsored by the National Institute of Child Health and Human Development, tested the effectiveness of low-dose aspirin (LDA [81 mg aspirin]) for the prevention of preterm delivery in 2020.¹⁴

This study demonstrated a reduction in preterm birth and perinatal mortality, which is defined as death occurring between 20 weeks of gestation and within seven days of delivery, with once-daily LDA for nulliparous women starting between 6 and 13 weeks of gestation and continuing until 36 weeks of gestation. Women who got LDA in this international randomized study in LMICs saw no difference in maternal hypertensive disorders, hemorrhage, or maternal death. Furthermore, there was no increase in significant adverse events in either the fetuses or pregnant women receiving LDA, indicating that LDA is a safe medication for this group.¹⁵

Aspirin raises the prostacyclin/TXA2 ratio and decreases platelet aggregation by preventing platelets from producing thromboxane A2. Additionally, it lessens the thrombin tissue factor's synthesis. Aspirin penetrates the placental barrier and prevents the aggregation of fetal platelets.¹⁶

- **Antenatal corticosteroid therapy:**

21 trials with 3885 adults and 4269 newborns were included in the most current Cochrane review on prenatal corticosteroids for women at risk for preterm delivery. For women who were anticipated to give birth preterm, the researchers included all randomized clinical trials of prenatal corticosteroid administration (betamethasone, dexamethasone, or hydrocortisone) versus placebo or no therapy. The risk of newborn mortality was reduced by 31% (95% confidence interval [CI] 19-42%, 3956 babies) by treatment with a single course of prenatal corticosteroids. When administered to pregnant women at risk for anticipated preterm delivery, antenatal corticosteroids can

penetrate the placenta and quicken the development of the fetus's lungs.¹⁷

According to the studies, giving the mother glucocorticoids betamethasone or dexamethasone before giving birth lowers the risk of the preterm baby dying out, suffering from respiratory distress syndrome, hemorrhage inside the brain, developing necrotizing enterocolitis, or having a patent ductus arteriosus. Necrotizing enterocolitis, patent ductus arteriosus, and bronchopulmonary dysplasia are other preterm birth morbidities that were reduced by prenatal glucocorticoid therapy.¹⁸

- **Progesterone:**

Through maintaining the condition of uterine quiescence, progesterone is crucial to the maintenance of pregnancy. There is mounting evidence that progesterone may operate as an anti-inflammatory agent to potentially moderate a woman's risk of premature delivery. Progesterone intake may be useful for some women who are thought to be at elevated risk of preterm delivery, particularly in lowering the chance of preterm birth before 34 weeks of gestation, according to evidence from randomized controlled trials and systematic reviews. Progesterone supplement treatment typically starts between 16 and 24 weeks of pregnancy and lasts until 34 to 36 weeks.¹⁹

Treatment with oral and vaginal micronized progesterone can delay PTB till 37 weeks of pregnancy, prolong the gestational period, and raise the weight of the baby. Progesterone administration till 34-36 weeks of gestation is usually suggested in cases of cervical narrowing without any signs of premature delivery.²⁰

- **Magnesium sulfate:**

Magnesium treatment was more likely to effectively postpone delivery for a minimum of 12 hours, according to randomized research contrasting intravenous nitroglycerin with magnesium sulfate. The evidence for the use of magnesium sulfate as a tocolytic must be distinct from the evidence for its use as an anticonvulsant during pregnancy (to prevent eclampsia) or for the neuroprotection of the fetus and infant right before very preterm birth, both of which are secure and productive for short-term use.

According to the meta-analysis, magnesium sulfate administered with the goal of preventing cerebral palsy and death lowered overall mortality rates (summary RR, 0.85; 95% CI, 0.74-0.98).¹⁷

- **Antibiotics:**

Preventive antibiotic medication has been demonstrated to be beneficial in extending the time between premature membrane rupture and birth. The antibiotic therapy of women with PPRM may have a more sophisticated mechanism of action than only preventing chorioamniotic infection to extend the latency period.

During expectant care of PPRM distant from term, ACOG advises a 48-hour regimen of ampicillin and erythromycin followed by 5 days of amoxicillin and erythromycin to prolong pregnancy and lower infectious and gestational age-dependent newborn morbidity. Ampicillin-clavulanic acid should not be used due to its link to a higher incidence of infant necrotizing enterocolitis. A 7-10-day course of antibiotic therapy should be given to patients with preterm premature rupture of the membranes. A macrolide (erythromycin or azithromycin), but not ampicillin-clavulanic acid, should be a part of any antibiotic therapy.²¹

- **Cervical stitch (cerclage):**

A common surgical operation done during pregnancy is a cerclage of the cervix. It entails placing a suture (stitch) across the cervix's neck in an effort to offer it mechanical support and lower the risk of premature delivery. In women who are at high risk for preterm delivery, cervical cerclage lowers that risk and may decrease the likelihood of perinatal mortality.

A crucial occurrence is cervical opening, especially before viability. The process of deterioration and the possibility of an early membrane rupture starts the moment the amniotic membranes are exposed to the vaginal flora. Delivery may be delayed by 4–9 weeks with surgical cervix closure. Cervical cerclage is the most frequently suggested treatment when there is cervical shortening combined with a history of premature delivery. If a physical examination reveals a cervical opening, a cerclage should be considered if there are no contractions or tripe symptoms.²²

Interventions for preterm newborns to enhance outcomes:

Both mothers and babies need skilled care at birth, and all providers should be qualified to care for both the mother and the baby. This includes preventing unnecessarily separating the two, promoting warmth, early and exclusive breastfeeding, cleanliness, and resuscitation if necessary. For full-term newborns, these procedures are crucial; but, for preterm babies, skipping or postponing any of these care procedures can quickly result in deterioration and death. Minutes matter at birth for all newborns.²³

- **Thermal care:**

After birth, there are easy ways to keep a baby's temperature stable, including drying and wrapping, raising the temperature of the surroundings, covering the baby's head (with a knit hat, for example), making skin-to-skin contact with the mother, and wrapping both of them in a blanket.

Next, we incorporate Kangaroo Mother Care (KMC), which has been shown to reduce infant mortality for weights under 2,000 g. Warming pads, warm cots, radiant heaters, and incubators are a few examples of equipment-dependent warming procedures; nevertheless, these need extra nursing knowledge and close observation.²³

- **Support required during feeding:**

It has been demonstrated that starting nursing soon after birth—within one hour—can lower infant mortality. Breast milk has nutritional, immunological, and developmental benefits for premature newborns. There are well-established short- and long-term advantages over formula feeding, including a decreased risk of infection and necrotizing enterocolitis and better neuro-developmental outcomes. The majority of preterm infants need additional assistance while drinking using a cup, spoon, or another item like gastric tubes (orally or nasally). For infants with extremely low birthweights, the WHO does advise supplementation with vitamin D, calcium, phosphorus, and iron, as well as vitamin K at birth for infants with low birthweight.²³

- **Prevention of infection:**

Clean birth practices decrease mortality and morbidity from infection-related causes, including tetanus, for both mothers and newborns. The risk of bacterial sepsis is increased in premature infants. In newborn care facilities, hand washing is vital. Recent cluster-randomized studies have revealed some advantages of topical chlorhexidine administration to the baby's cord and no known disadvantages.

Maintaining the infant below the level of the placenta while clipping the umbilical cord at the proper time—two to three minutes, or until the chord stops pulsing—is another efficient and affordable intervention. This lessens the possibility of cerebral hemorrhage, the requirement for blood transfusions, and the development of subsequent anemia in premature infants.²³

- **Newborns with respiratory distress syndrome:**

Nasal prongs or nasal catheters are two oxygen delivery techniques for preterm infants with RDS. Any infant receiving continuous oxygen treatment should be monitored with a pulse oximeter since safe oxygen management is essential.

To decrease lung and alveolar collapse, CPAP generally delivers pressured, humidified, warmed gas (air and/or oxygen) through nose prongs. With better referral settings and support mechanisms, such as highly staffed, round-the-clock laboratories, this model of lower intensity may be possible for implementation on a larger scale in middle-income and some countries with low incomes.²³

Recent studies have shown that CPAP decreases the requirement for neonatal intensive care unit transfers and positive pressure breathing for infants under the gestational age of 28 weeks. An oxygen source, an oxygen-monitoring device, and a suction machine are all pieces of supporting equipment that are necessary for the safe and successful application and delivery of CPAP-assisted breathing. One of the reasons preterm newborns get RDS is because natural surfactant is absent from their lungs, surfactant is given to them to make up for it.²³

CONCLUSION

In conclusion, diagnosing preterm contractions and assessing preterm birth risk involves a multi-faceted approach, including medical history, membrane rupture tests, infection screenings, and evaluating signs of true labor. Using these methods, healthcare providers can make informed decisions and implement interventions to improve outcomes for both mothers and newborns. While numerous diagnostic methods exist and various preventive measures can be taken to address preterm birth, there is a need for further enhancements to encourage natural childbirth.

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