

Management of preterm labour

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Abstract

Preterm birth is defined as birth before 37 weeks of gestation and is the single biggest cause of neonatal morbidity and mortality. The UK preterm birth rate is 7.9%, therefore approximately 1 in 13 babies are born prematurely. This is despite advances in prediction of those at risk, prevention strategies and treatment. Transvaginal ultrasound and fetal fibronectin have been the major advances in the prediction of preterm labour, and with the use of both of these tests it may be possible to predict up to 75% of those who will deliver prematurely. At best, tocolytics are able to delay preterm labour long enough for the administration of corticosteroids. Labour involves complex and co-ordinated events, greater knowledge of which is necessary to understand processes involved in premature labour and advance health-care in this field.

Keywords high risk; obstetric labour; pregnancy; premature; progesterone/therapeutic use; tocolysis

Introduction

Preterm birth, defined as birth before the 37th week, can be further subdivided according to gestational age as shown in [Table 1](#). Preterm birth contributes to substantial neuro-cognitive, pulmonary and ophthalmologic morbidity and globally accounts for 28% of neonatal deaths. Over the past decade, survival rates have dramatically improved. However this is due to improvements in neonatal care rather than improvements in obstetric care, and while babies born at extremely low gestations are surviving in greater numbers, they still having similar rates of intraventricular haemorrhage, necrotizing enterocolitis, chronic lung disease and retinopathy of prematurity as they were 10 years ago. For example, babies born at 26 weeks of gestation and above now have a survival rate of approximately 75%, however approximately 40% will suffer from some form of disability. It has been shown that prolonging a pregnancy from 30 weeks to 34 weeks gestation decreases the neonatal mortality from 9.6% to 0.9%. A key factor in improving outcomes for these babies is to therefore aim to predict and prevent preterm birth.

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Definition of preterm deliveries gestation

	Gestation (weeks)	% Of premature deliveries
Extreme Prematurity	<28	5
Severe Prematurity	28 to 31 + 6	15
Premature	32 to 33 + 6	20
Near Term	34 to 36 + 6	60

Table 1

Incidence of preterm birth

The incidence of preterm birth is increasing in both the UK and USA. The UK preterm birth is around 7.9%, compared to approximately 12% in the USA. This rate has not altered despite advancing knowledge of risk factors related to preterm labour and the introduction of many public health and medical interventions, such as tocolysis, e.g. Atosiban and Nifedipine, designed to delay preterm birth.

Causes of preterm birth

The principal pathways leading to preterm birth are spontaneous preterm labour (PTL), preterm prelabour rupture of the membranes (PPROM) and iatrogenic causes. Approximately 45% of births occur following spontaneous PTL, 30% are iatrogenic and 15% follow PPROM. PPROM is defined as preterm spontaneous rupture of membranes, at least 1 hour before the onset of contractions. In addition to prematurity, PPROM is particularly associated with maternal sepsis and chorioamnionitis. Iatrogenic causes are deliveries (labour induction or Caesarean section) for maternal or fetal indications, such as pre-eclampsia and fetal growth restriction.

There are several maternal characteristics associated with preterm labour ([Table 2](#)). Maternal ethnicity has a significant impact on risk of preterm delivery. In the USA in 2003, the preterm birth rate for African-American women was 17.8%, compared to 10.5% in Asian and Pacific Islanders and 11.5% for Caucasian women. Previous preterm delivery increases the risk of a subsequent preterm delivery 2.5 fold, with those women with a previous preterm delivery at the lowest gestations at highest risk.

PTL is a complex process and is likely the endpoint of multiple influencing factors ([Figure 1](#)). It is useful to consider the management of PTL in three sections: the detection of those women at high risk, prevention of PTL in high risk women and finally diagnosis and treatment of those women in PTL.

Prediction – in the general population and those at increased risk

There are several studies that have been carried out to investigate methods of predicting PTL in women at high risk. In addition to the identification of risk factors ([Table 3](#)); the main methods used are transvaginal ultrasound and fetal fibronectin (FFN).

Survival rates at extreme premature gestations following admission for neonatal care

Gestation	Total % survival rate (without disability)	Morbidity at 6 years of age in all infants born < 27 weeks
23	29 (15)	22% severe disability (cerebral palsy and not walking, low cognitive scores, blindness, profound hearing loss)
24	46 (28)	24% moderate disability (cerebral palsy but walking, cognitive scores in special educational needs range, lesser degree of visual of hearing impairment)
25	69 (47)	34% mild disability (low cognitive scores, visual disturbance requiring glasses)
26	78 (61)	20% no problems

Table 2

Transvaginal ultrasound

Transvaginal ultrasound to measure cervical length and funnelling has been studied as a screening test for preterm labour. It has been shown to be safe, acceptable, and reproducible. Cervical length at 24 weeks has been shown to be normally distributed with a mean length of 35.2 mm ± 8.3 mm. In normal pregnancies delivered at term, the cervical length stays relatively constant until the third trimester.

There is an inverse relationship between cervical length and incidence of preterm delivery and it has been shown that a

relative risk of preterm delivery can be assigned to a particular cervical length. For example, a woman with a cervical length of 22 mm has a relative risk of PTL of nine-fold while a women with a cervical length of <13 mm has a relative risk of fourteen-fold, when compared with longer cervical length. In the general population, only 1.7% of women have a cervical length less that 15 mm and these women account for 100% of births prior to 26 weeks, 80% of births prior to 30 weeks of gestation and 60% of births prior to 32 weeks of gestation. Therefore, a cervical length less than 15 mm is a sensitive predictor of severe prematurity, as it is associated with a 50% risk of delivery prior to 32 weeks of gestation.

Funnelling, which is opening of the internal os with closed cervix below, has also been shown in some studies to be associated with an independent risk factor for PTL, while other studies have contradicted this. It is likely that the length of the closed cervix below the funnel is more important. The RCOG have advised that funnelling of the cervix should not be used as an independent factor for the insertion of a cervical suture without shortening of the cervix below.

In order for a screening test to be effective, there needs to be an effective available treatment. At present there is no conclusive evidence that any one intervention helps to prevent preterm labour following the identification of cervical shortening or funnelling. Therefore the main benefit of transvaginal ultrasound screening may be its high negative predictive value of 90% for cervical length over 30 mm at 24 weeks. Women may be reassured, avoiding further clinic visits and intervention.

The guidance from the RCOG is to offer serial sonographic surveillance of cervical length for women with a history of spontaneous second trimester loss or preterm delivery, as there is evidence to suggest that those who experience cervical shortening are at an increased risk of subsequent early delivery and may benefit from ultrasound-indicated cerclage. However, as this area is still lacking in evidence, women should be informed that expectant management is a suitable alternative to serial cervical

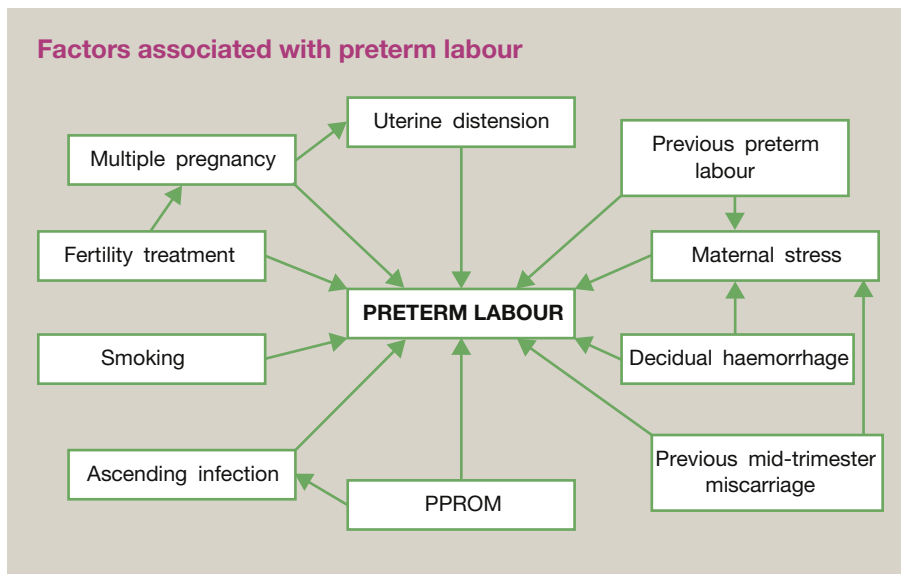


Figure 1

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