

Management of preterm labour

Clare Mullan

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%, meaning 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 have similar rates of intraventricular haemorrhage, necrotizing enterocolitis, chronic lung disease and retinopathy of prematurity as they did 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.

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, designed to delay preterm birth.

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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. 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 being at highest risk.

PTL is a complex process and is likely the endpoint of multiple influencing factors ([Figure 1](#)).

Case 1

A 27-year-old woman is referred to your antenatal clinic after her booking appointment. She had a cone biopsy two years previously for cervical intraepithelial neoplasia (CIN) and is concerned as her gynaecologist told her that this could put her at increased risk of preterm birth.

What would you ask?

It is important to take a full obstetric and relevant gynaecological history. Cone biopsy is considered a risk factor for preterm birth. Evidence points to the depth of tissue that has been removed as being the most relevant factor when considering the risk of preterm birth. Therefore, it is essential to determine what treatment has occurred, through history and review of procedure notes if possible.

There are various other risk factors for preterm birth ([Table 3](#)) and a detailed obstetric history should be able to identify these.

What would your next step be?

You should offer her transvaginal cervical surveillance in a dedicated PTL clinic. Transvaginal ultrasound to measure cervical length and funnelling is a safe, acceptable, and reproducible screening test. Cervical length at 24 weeks has been shown to be normally distributed with a mean length of 35.2 mm \pm 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. 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 woman 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 than 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

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

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)
		34% mild disability (low cognitive scores, visual disturbance requiring glasses)
		20% no problems
25	69 (47)	
26	78 (61)	

Table 2

Risk factors for spontaneous preterm labour

Maternal Characteristics	Pregnancy Complications	Obstetric History
Non-white ethnicity	Multiple pregnancy	Shortened cervix
BMI < 19.8	Infection	Cervical surgery e.g. Cone biopsy/multiple LLETZ procedures
Age less than 18 and over 40	Bleeding < 24 weeks	1 previous preterm labour = 13–21% risk
Poor nutrition		2 previous preterm labours = 42% risk
Smoking		previous 2nd trimester miscarriage
Low socioeconomic status		previous history of repeat TOP

Table 3

a sensitive predictor of severe prematurity, as it is associated with a 50% risk of delivery prior to 32 weeks of gestation.

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.

Whilst you take your history, she informs you that her gynaecologist told her that she would be likely to need a cervical suture. How would you counsel her about this and how would you decide if this was necessary?

Cervical suture or cerclage has been widely used in the management of pregnancies at high risk of preterm delivery. It was

Factors associated with preterm labour

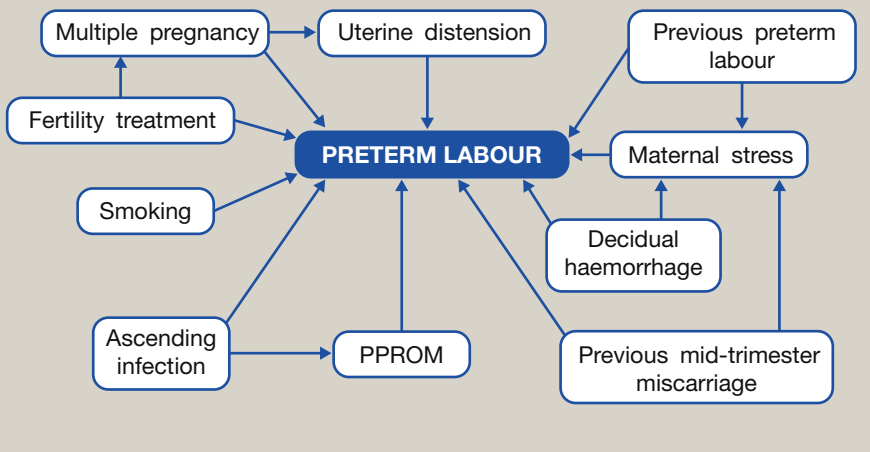


Figure 1

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