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Risk screening for spontaneous preterm labour

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Prevention of viable spontaneous preterm birth before 34 weeks' gestation through screening is one of the key aims of antenatal care as birth below this threshold of prematurity has implications for child, mother and society. If women can be identified to be at high risk of spontaneous preterm birth in early pregnancy, they can be targeted for more intensive antenatal surveillance and prophylactic interventions (primary prevention). However, the disease mechanisms behind preterm birth are not well understood. Consequently, tests for its prediction and treatments for its prevention are not well developed. Additionally, no randomised controlled trial focusing on prevention of spontaneous preterm birth related perinatal morbidity and mortality through a screening programme exists.

This chapter describes a generic framework for combining screening information with therapeutic effect to delineate its role in a screening programme. We use test–treatment combination of previous history of preterm birth and progestational agents as an example. A decision-making framework is built using: (1) evidence for post-test probabilities; (2) evidence for therapeutic effectiveness; and (3) integration of the two evidences to estimate the effect of the test–treatment combination with numbers needed to treat (NNTs). The NNT to prevent one case of spontaneous preterm birth before 34 weeks' gestation with progesterone is seven in women with a previous history; NNT is 41 in women without a previous history; and it is 28 when previous history was not used to guide a decision about prevention. The proposed framework makes decisions about screening and prevention explicit.

Key words: randomised controlled trials; screening; therapeutic effectiveness; systematic review.

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History (risk factors and symptoms), examination (signs) and sophisticated investigations (haematology, biochemistry, radiology, microbiology, etc.), all contribute to the prediction for the development of an ailment (Figure 1).[1] In this chapter we will consider any of these to be a screening test. Obstetricians routinely employ these tests in antenatal care to make decisions about screening and prevention. Is our approach to risk screening for preterm birth rational? In answering this question, we need to consider the condition that requires screening, the available tests and treatments for the condition, and their combination into a screening programme.[2,3] Ideally the effectiveness of the screening programme should be established in randomised controlled trials, but no trials exist that evaluate the effects of risk screening on perinatal morbidity and mortality for preterm birth. We have previously provided a generic framework for incorporating information gained from testing into therapeutic decision-making.[1] In this chapter we develop this framework for risk screening and managing asymptomatic pregnant women for preventing spontaneous preterm birth.

DELINEATION OF THE PROBLEM (PRETERM BIRTH) THAT REQUIRES SCREENING

Preterm birth is a heterogeneous condition where up to 30–40% of all cases are due to elective delivery for a maternal or a fetal complication. The remaining 60–70% occurs spontaneously. Advances in perinatal healthcare have not reduced the rate of spontaneous preterm birth, defined as birth before 37 weeks' gestation, which occurs in 7–11% of pregnancies. This definition is often considered irrelevant to current practice as outcomes after 34 weeks' gestation are generally considered to be as good as those after 37 weeks' gestation, though the risk of minor morbidities remains.[4] Spontaneous preterm birth before 34 weeks' gestation occurs in 3–7% of pregnancies[5,6] but accounts for around 75% of neonatal mortality and 50% of long term neurological impairment in children.[7–9] Many of the surviving infants suffer serious morbidity such as respiratory distress syndrome, bronchopulmonary dysplasia, intraventricular haemorrhage, retrolental fibroplasia and developmental problems. Thus preterm birth has serious effects on mother, child and society, which

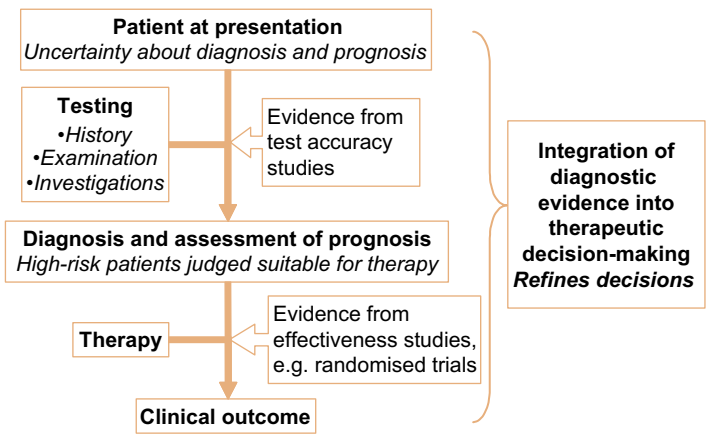

Figure 1. Clinical process signifying the justifiable place for testing in clinical decision-making (adapted with permission[1]).