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Full length article

Increasing compliance with a clinical practice guideline for fetal fibronectin testing and the management of threatened preterm labour: A quality improvement project

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ABSTRACT

Objective: To increase adherence to a local hospital clinical practice guideline for the use of fetal fibronectin testing in women presenting with symptoms of threatened preterm labour.
Study design: A quality improvement project using a multi-faceted implementation strategy.
Setting: National Women's Health, Auckland City Hospital; a tertiary referral maternity unit in Auckland, New Zealand.
Population: All obstetricians, junior obstetric doctors and hospital employed midwives.
Methods: A pre-education audit and survey, compulsory interactive educational intervention with audit feedback and provision of reminders followed by a post-education audit and survey one year later.
Main outcome measures: Number of fetal fibronectin tests performed, proportion of tests performed meeting clinical criteria for testing and proportion of results managed according to hospital guideline.
Results: There was a 25% increase in the number of tests performed with an increase in the proportion that met clinical criteria for testing, 76% (31/41)–93% (51/55) (OR 4.1, 95% CI 1.2–14.2). Adherence to guidelines for clinical management according to fFN results changed over time, 80% (33/41)–95% (52/55) (OR 4.2, 95% CI 1.04–17.0). Clinician knowledge on some (but not all) indications for fFN testing improved. Education and reminders did not improve understanding of clinical scenarios that may result in a false positive fFN test.
Conclusions: A multi-faceted approach of audit and clinician feedback, interactive education and reminders supports the implementation of a clinical practice guideline for the use of fFN as a preterm birth prediction test for women presenting with symptoms of threatened preterm labour.

Introduction

Early preterm birth before 34 weeks gestation is associated with significant perinatal mortality and morbidity. Preterm birth is the leading direct cause of neonatal death, accounting for almost one third of neonatal deaths worldwide [1]. Despite attempts to reduce preterm birth, rates are increasing across almost all countries that report reliable data [2]. There are no effective treatments that stop preterm labour, so strategies to improve perinatal outcome rely on accurate identification of those at risk of imminent preterm birth to target interventions proven to reduce perinatal mortality and morbidity despite early birth. These interventions include the administration of antenatal corticosteroids for fetal lung maturation [3–5], the administration of magnesium sulphate for fetal neuroprotection [6,7], and *in-utero* transfer to a facility with appropriate neonatal intensive care support [8].

Accurate identification of those at risk of spontaneous preterm birth remains a significant challenge. Signs and symptoms of preterm labour are relatively poor indicators of which women will actually go on to deliver preterm, with >70% of women presenting in threatened preterm labour delivering after 37 weeks [9]. Preterm birth prediction tests such as the vaginal biomarkers fetal fibronectin (fFN) and placental alpha microglobulin (PAMG-1, PartoSure®), may allow us to triage women with symptoms of preterm labour to identify those women at highest risk of preterm birth and to target interventions that reduce perinatal mortality

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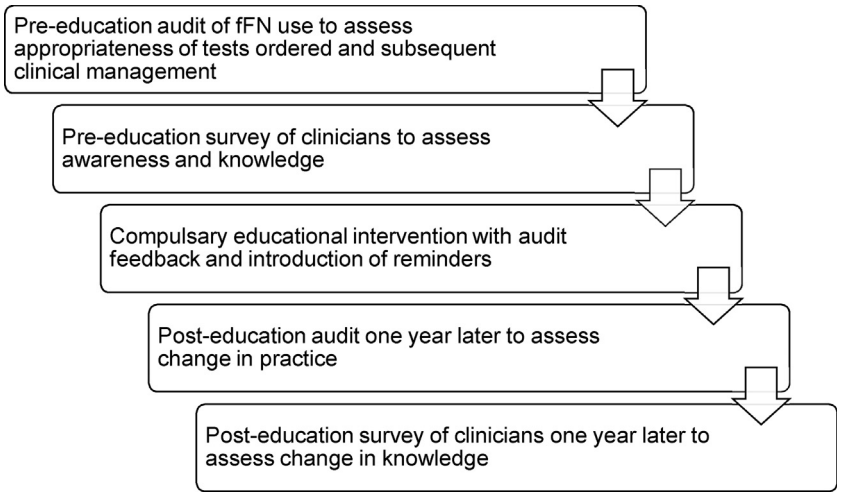

Fig. 1. Five steps of the quality improvement process.

and morbidity most appropriately, whilst reducing unnecessary interventions for those at lower risk [10].

Observational studies of practice after the introduction of routine fFN testing suggest that clinicians alter the care they provide according to fFN result [11–13] but that change in practice develops over time suggesting experience and confidence in the test contribute to practice change [14]. However, a recent systematic review of six randomised trials of fFN testing (revealed fFN result versus concealed result or no fFN test) demonstrated no difference in the antenatal management received or subsequent rates of preterm birth and perinatal outcome with slightly higher mean hospital costs associated when fFN results were available [9]. Publication of this review included editorial comment that the continued use of fetal fibronectin testing in women with threatened preterm labour could not be justified. However in three of the six included trials treatment was left to 'physician's discretion' regardless of whether the fFN result was revealed or, when it was, if the result was positive or negative. The true value of fFN can only be examined if clinicians are aware of the result and alter their practice accordingly.

Clinical practice guidelines at national, regional and local levels include advice not only on the use of fFN testing but also management plans according to the subsequent result [5,15]. However, availability of clinical practice guidelines alone may be insufficient to influence clinicians to make this practice change. Indeed we identified the use of fFN testing in women presenting with symptoms of preterm labour as an area of concern after an audit in our local unit showed that a significant proportion of fFN tests and the management of women with threatened preterm labour did not comply with local hospital guidelines. The Royal College of Obstetricians and Gynaecologists defines clinical audit as a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change [16]. We therefore established this quality improvement project to implement such a change in practice. We used a multi-faceted approach of audit and clinician feedback, interactive education and reminders to enhance adherence to the local hospital clinical practice guideline for the use of fetal fibronectin testing in women presenting with symptoms of threatened preterm labour.

Methods

This quality improvement project was initiated by the Performance Improvement Team at Auckland District Heath Board (ADHB) and was carried out at National Women's Health, Auckland City Hospital, a tertiary referral maternity unit in Auckland, New Zealand with approximately 7000 births per year. The team consisted of a project manager from the Performance Improvement Team, a senior obstetrician, clinical director of obstetric services, two obstetricians in training and a senior hospital midwife. A five step process was undertaken (Fig. 1).

1 Pre-education audit

An audit of fFN testing and subsequent clinical management of tests was carried out. This pre-education audit assessed all fFN tests performed in the four month period from 1 December 2012 until 31 March 2013, as identified from central laboratory records. Two clinicians independently reviewed each woman's electronic clinical records against a pre-defined checklist of criteria, and review from a third senior clinician was utilised to resolve any discrepancies.

Information was collected on age, ethnicity, gestation and clinical details to assess whether the fFN testing met hospital guideline inclusion criteria for testing (Appendix A). The fFN test result (positive >50 ng/ml or negative ≤50 ng/ml) and clinical management was recorded including admission to hospital; administration of antenatal corticosteroids, tocolysis and magnesium sulphate if <30 weeks gestation; use of ultrasound scan and neonatologist review. Information was also collected on gestation at delivery; time interval from fFN testing to delivery; and if preterm birth occurred, whether this was spontaneous or indicated. All information was entered into a Microsoft Access database. Utilising this data, three questions were considered for each case:

1. Did fFN testing meet hospital guideline criteria?
2. Was fFN testing deemed clinically appropriate?
3. Was subsequent clinical management based on the fFN result clinically appropriate?

Clinical appropriateness of fFN testing was considered in addition to whether testing met hospital criteria due to identification of a number of fFN tests that had not been discussed with an obstetric specialist yet met all other hospital criteria and were considered clinically appropriate. Appropriateness of subsequent clinical management according to the fFN result was determined by adherence to recommendations from the hospital guideline, whereby women with a negative fFN and no other clinical concerns should be discharged home with later clinic