ROYAL
COLLEGE
OF MIDWIVES

ISSN: 1479-4489 December 2008 Vol.6 No.4

EVIDENCE BASED MIDWIFERY

ROYAL
COLLEGE
OF MIDWIVES

EVIDENCE BASED MIDWIFERY

December 2008
Volume 6 Issue 4

EVIDENCE BASED MIDWIFERY IS A STANDALONE PEER-REVIEWED JOURNAL PRODUCED BY THE ROYAL COLLEGE OF MIDWIVES

Evidence Based Midwifery
Royal College of Midwives
15 Mansfield Street
London W1G 9NH
United Kingdom

Publishers:
Redactive Media Group

CONTENTS

Midwife-led versus other models of care for childbearing women: implications of findings from a Cochrane meta-analysis

Key words: Midwife-led care, continuity of care, Cochrane review

Midwives are primary providers of care for childbearing women around the world. However, there has been a lack of synthesised information to establish whether there are differences in morbidity and mortality, effectiveness and psychosocial outcomes between midwife-led and other models of care. In midwife-led care, the midwife is the woman's lead professional, with one or more consultations with medical staff often part of routine practice or as necessary. Other models of care are where the physician/obstetrician is the lead professional, and midwives and/or nurses provide intrapartum and postpartum care under medical supervision in hospital. Shared care is where the lead professional changes depending on whether the woman is pregnant, in labour or has given birth, and on whether care is given in the hospital, birth centre (free standing or integrated) or in community setting(s); and where the majority of care is provided by physicians or obstetricians.

The primary objective of this review was to compare midwife-led models of care with other models of care for childbearing women. It was hypothesised that differential effects and outcomes were due to the levels of continuity with the care provider (caseload models of care offer higher levels of personal relationship continuity than team), whether women were categorised as low or mixed risk, and provision of pregnancy care in a community setting.

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (January 2008), Cochrane Effective Practice and Organisation of Care Group's Trials Register (January 2008), Current Contents (1994 to January 2008), CINAHL (1982 to August 2006), Web of Science, BIOSIS Previews, ISI Proceedings, (1990 to 2008), and the World Health Organization Reproductive Health Library, number nine. We did not apply any language restrictions. Trial authors were contacted for additional data where necessary.

Models of care were classified as midwife-led, other or shared care on the basis of the lead professional in the ante- and intrapartum periods, as decisions and actions taken in pregnancy often affect intrapartum events. All published and unpublished trials in which pregnant women were randomly allocated to midwife-led or other models of care during pregnancy, and where care is provided during the ante- and intrapartum period in the midwife-led model. All authors evaluated methodological quality. Two authors independently checked the data extraction.

The review summarises 11 trials involving 12,276 women in four countries. The trials involved midwife-led models of care that included either team or caseload midwifery, women classified as low or mixed risk, and care provided in both community and hospital settings. The trials included licensed midwives, and none included lay or traditional midwives. All trials were conducted in high-income countries and no trials offered home birth.

Levels of continuity (measured by the percentage of women who were attended during birth by a known carer varied between 63% to 98% for midwife-led models of care to 0.3% to 21% in other models of care). Women were classified as being at low risk of complications in six studies, and as 'low and high' and 'high' risk in five studies. Two studies offered a caseload team model of care, and nine studies provided a team model of care.

In the primary comparison, the results consistently showed significantly less use of some interventions for women who were randomised to receive midwife-led care compared to women randomised to receive other models of care. Specifically, women were less likely to experience antenatal hospitalisation, the use of regional analgesia, episiotomy and instrumental delivery, and more likely to experience spontaneous vaginal birth, no intrapartum analgesia/anaesthesia, feeling in control during labour and childbirth and to be attended at birth by a known midwife.

In addition, women who were randomised to receive midwife-led care compared to women randomised to receive other models of care were less likely to experience fetal loss before 24 weeks' gestation, and their babies were more likely to have a mean shorter length of neonatal stay. There were no statistically significant differences between groups for total fetal loss/neonatal death or more than or equal to 24 weeks. Overall, we did not find any increased likelihood for any adverse outcome for women or their infants associated with having been randomised to a midwife-led model of care. These results were moderate in magnitude and generally consistent across all the trials.

Women's experiences of care reported included maternal satisfaction and in the majority of studies, satisfaction with care appeared to be higher in the midwife-led compared to other models of care.

Results generally suggested a cost-saving effect in intrapartum care and a trend towards a cost-saving effect of midwife-led care in comparison with medical-led care.

Not all areas of the world have health systems where midwives are able to provide midwife-led models of care and health system financing is a potential barrier to implementation. Policy-makers who wish to achieve clinically important improvements in maternity care, particularly around normalising and humanising birth, should consider midwife-led models of care and consider how financing of midwife-led services can be reviewed to support this.

Reference

Hatem M, Sandall J, Devane D, Soltani H, Gates S. (2008) Midwife-led versus other models of care for childbearing women: In: Cochrane Database of Syst Rev. *The Cochrane Library* **Issue 4**: CD004667. DOI: 10.1002/14651858.CD004667.pub2. John Wiley and Sons: Chichester.

Professor Jane Sandall
PhD, MSc, BSc, HV, RM, RN
Professor of midwifery and women's health, King's College London.

Rowan C, Bick D. (2008) An evaluation of the provision of perinatal mental health services in two English strategic health authorities. *Evidence Based Midwifery* **6(4)**: 112-118

Evaluation of the provision of perinatal mental health services in two English strategic health authorities

Cathy Rowan[1] *MA, PGCEA, RM. Debra Bick*[2] *PhD, MMedSc, BA, RM.*

1 Senior lecturer midwifery, Centre for Research in Midwifery and Childbirth, Faculty of Health and Human Sciences, Thames Valley University, Paragon House, Boston Manor Road, Brentford, London TW8 9GA England. Email: cathy.rowan@tvu.ac.uk

2 Professor of evidence-based midwifery practice, Florence Nightingale School of Nursing and Midwifery, King's College London, James Clerk Maxwell Building, 57 Waterloo Road, London SE1 8WA England. Email: debra.bick@kcl.ac.uk

The study was funded by Mental Health Connect.

Abstract

Background. Maternal mental health problems range from transient depression and anxiety to severe depression and psychosis, which in some cases may result in suicide. The 2004 *Confidential Enquiry into Maternal and Child Health* highlighted the importance of screening and appropriate management of women at risk. Maternity service guidelines published by the National Institute for Health and Clinical Excellence also include recommendations for screening and care of women with perinatal mental health problems.

Aims. To undertake an evaluation of service provision in two strategic health authorities (SHAs) to identify and report on how far recommendations had been implemented in 2007.

Methods. This paper reports on the first stage of a two-stage study. For this stage, a survey was conducted of maternity services in the SHAs to ascertain the extent to which guidelines and protocols for screening for maternal mental illness and subsequent management had then been implemented.

Results. Responses were received from 24 of 39 maternity units. Most had guidelines to assist staff to identify women at risk of mental illness during pregnancy. However, less than half had access to a specialist psychiatrist or midwife. Although units were attempting to strengthen liaisons with psychiatric services, many faced planning and resource issues. Units acknowledged that they did not comply with all the recommendations for services to meet perinatal mental health needs, but several had plans in place to develop this.

Discussion. Although most units were implementing screening at booking, there were variations in referral mechanisms and liaison with mental health professionals. It is likely that measures that require less intensive resources are more likely to be implemented.

Conclusions. Many units within the two SHAs were attempting to revise services to meet the needs of women with mental health needs, however, it is clear that there was some way to go before policy and practice recommendations were fully integrated into practice.

Key words: Perinatal mental health, mental illness, screening, mental health services, policy, childbirth, postal survey

Introduction

The 2001 and 2004 reports of the *Confidential Enquiry into Maternal and Child Health* (CEMACH) (Lewis, 2001, 2004) identified suicide as the leading overall cause of maternal death. Both reports highlighted that half of the women who took their own lives had a previous psychiatric history and, had the risk of recurrence of mental illness been recognised and managed, the outcome may have been different. In addition to the devastating impact of a mother's suicide, mental health problems can have negative consequences on a woman's relationship with her baby and the child's subsequent emotional and cognitive development (Murray and Cooper, 1997; O'Connor et al, 2002). The Confidential Enquiries (Lewis, 2001, 2004) and the National Institute for Health and Clinical Excellence (NICE) guidelines on antenatal and postnatal care (NICE, 2003, 2007) made a series of recommendations for maternity services to identify women at risk promptly and appropriately manage those with existing mental health problems. There is a dearth of evidence with regard to the extent to which UK maternity services are meeting the needs of these women, although it is encouraging that the most recent confidential enquiry report (Lewis, 2007) highlighted a reduction in the number of women taking their lives during or after pregnancy.

This paper reports findings from the first of a two-stage study to identify how far recommendations, relevant to meeting maternal mental health needs had been implemented in maternity units in two strategic health authorities (SHAs) following the 2001 and 2004 CEMACH reports (Lewis, 2001, 2004), publication of the *National Service Framework for children, young people and maternity services* (Department of Health, 2004) and the NICE routine antenatal and postnatal care guidelines (NICE 2003, 2006).

Data were collected in early 2007 prior to publication of the NICE antenatal and postnatal mental health guidelines (NICE, 2007) and the 2007 CEMACH report (Lewis, 2007).

Background

Depression and puerperal psychosis are two of the most serious perinatal mental health disorders. Women with these conditions appeared most likely to commit suicide after giving birth (Lewis, 2001, 2004). Those with a previous personal or family history of depression, postnatal depression or bipolar disorder have an increased risk of

developing depression or psychosis in the postnatal period (Chaudron and Pies, 2003; Jones and Craddock, 2001) and could potentially have their own and their family's mental health history identified during pregnancy. Although evidence does not support the routine administration of screening tools in pregnancy or the postnatal period, such as the Edinburgh Postnatal Depression Scale (EPDS) (National Screening Committee, 2006; NICE, 2003, 2006), it is recommended that women are asked about previous family or personal psychiatric history when they attend antenatal clinics (NICE, 2003; Lewis, 2004). Lewis (2004) also recommended that guidelines for the management of women at risk of a serious mental illness after giving birth should be in place in every NHS Trust providing maternity services, that there should be sufficient mother and baby units, a specialist mental health team available and appropriate training for health professionals.

The National Service Framework for children, young people and maternity services (Department of Health, 2004) included several important recommendations to meet the needs of pregnant and postnatal women with mental health problems (see Table 1). These include that service providers should have policies in place to identify and support women at high risk of developing serious postnatal mental health problems and women should receive information to assist them in disclosing mental health issues. Joint working arrangements for maternity and mental health services should be implemented, including written plans of agreed multidisciplinary interventions and actions to be taken for women at risk of a repeat severe mental illness. There should also be provision for women who require it, to be admitted to a mother and baby psychiatric unit – although there is no trial-based evidence to support the effectiveness of this for women diagnosed with schizophrenia or psychosis (Joy and Saylan, 2007).

The recommendations of the Confidential Enquiries (Lewis, 2001, 2004) and the Department of Health (2004) resulted in some NHS Trusts reviewing procedures and developing services to support women with mental health problems. A range of initiatives were implemented, including consultant midwife-led clinics (Dunkley-Bent, 2004), additional training for midwives (Ross-Davies et al, 2006), introduction of screening procedures (Sullivan et al, 2003) and enhanced multidisciplinary working (Gibbon, 2004). Many were locally developed services, which provided limited information of the impact on women's psychological health outcomes or resource consequences for local healthcare provision.

Despite initiatives to revise local services, a number of barriers to achieving change have been highlighted, as has the fragmentation of existing services. Tully et al (2002) surveyed maternity units in England and Wales to identify problems encountered caring for women with mental health problems and use of policies, guidelines and practice to identify and manage perinatal depression. A total of 182 maternity units replied – a response rate of 86%.

Some units had implemented routine screening for depression during the antenatal and/or postnatal period, although policies and practices varied with respect to referral and management. A third of units had management policies or guidelines, but few audited outcomes of their use. When asked about barriers to care, commonly-reported difficulties included lack of clear referral pathways and insufficient training to enable staff to identify and manage mental health issues. The researchers suggested future studies should obtain detailed information on policies, practices and barriers pertaining to care of women with depression.

A more recent survey of mental health Trusts in England (Oluwato and Friedman, 2005) identified a lack of specialist perinatal services, with only a third of units providing facilities for the admission of mothers and babies and a quarter of Trusts providing a full range of services from inpatient to liaison clinic services. Four Trusts reported that as they served a large geographical area with too few women in need of specialist mental

Table 1. Recommendations included in the National Service Framework standard 11 (maternity services) (Department of Health, 2004) to meet maternal mental health needs

Antenatal care recommendations

All NHS maternity care providers have policies and protocols in place for identifying and supporting women who are at high risk of developing a serious postpartum mental illness, which will help to deliver the Department of Health national target on improving the health of the population, which includes reducing mortality from suicide. These include ensuring that all pregnant women are:

- Asked about any previous history of psychiatric disorder and/or family history of serious mental illness early in their pregnancy; and
- Provided with information on pregnancy and mental health, which helps them to disclose and discuss mental health issues (Department of Health, 2004: 22).

Postnatal care recommendations

- All professionals involved in the care of women immediately following childbirth need to be able to distinguish normal emotional and psychological changes from significant mental health problems, and to refer women for support according to their needs
- Each woman who has been identified as at risk of a recurrence of a severe mental illness has a written plan of agreed multidisciplinary interventions and action to be taken
- SHAs and all NHS Trusts plan for the provision across SHA boundaries, of sufficient capacity for specialist inpatient psychiatric mother and baby treatment, so that all women who require it can be admitted with their baby (unless there is a specific contra-indication) to a specialist mother and baby psychiatric unit (Department of Health, 2004: 35).

health services, this was a barrier to revising services in line with recommendations.

A report published by the mental health charity MIND (2006), which presented data from a survey completed by 148 women, including a number of in-depth interviews, highlighted that those with mental health problems continued to have difficulty gaining access to advice, information and care. Over two-thirds had to wait a month or more for treatment, with one in ten having to wait over a year. Of 27 women admitted to hospital, ten were admitted to a specialist mother and baby unit, and 17 to a general psychiatric ward, 14 of whom were admitted without their babies. MIND recommended that smaller maternity Trusts should employ a consultant with an interest in perinatal mental health and larger units should develop specialist psychiatric services.

Methods

For the first stage of the study, a semi-structured postal questionnaire developed by the researchers to meet the aims of the service evaluation was sent to all maternity care providers at two SHAs (South-Central and London) in April 2007. The rationale for the selection of the two SHAs was to capture data on services provided by maternity units serving diverse populations across rural, urban and inner-city areas. Questions were included on the provision of services and content of care in line with policy and practice recommendations (Lewis, 2001, 2004; Department of Health, 2004; NICE, 2003, 2006). (See Table 2 for areas of interest.)

Survey questionnaires were completed by the person identified with the most appropriate knowledge of the unit's mental health services, preferably the 'lead' in this area, with all letters addressed to the head of midwifery in the first instance. A letter to participants was included with the questionnaire explaining the study's aims and objectives. As this was an evaluation of service provision, ethical approval was not required, as confirmed by the National Research Ethics Service office. All data were treated as confidential and no names were used.

Findings

Of 39 maternity units across the two SHAs, 24 returned a completed questionnaire, giving a response rate of 62%. There was a higher response from units within the South-Central area, with all but one of the eight units responding. Of 31 London units sent questionnaires, 17 responded. The person designated to complete the questionnaire was most often the head of midwifery (n=7), but questionnaires were also completed by other senior clinical midwives (n=6), directorate managers (n=3), hospital matrons (n=2), community midwives (n=2), a child protection midwife, a practice development midwife and consultant midwives (n=2).

Table 2. Areas of interest included in the strategic health authorities' service evaluation

- Implementation of screening for mental health problems
- Referral procedures
- Designated lead for coordinating services (including allocation of lead clinician) across care sectors
- Access to mother and baby units
- Services for women who had a traumatic birth, including listening or debriefing services (as defined by the unit)
- Coordination of care across acute and primary care sectors
- Provision of training for clinicians to meet maternal mental health needs
- Future plans.

Screening

Some 17 of the 24 units had guidelines (also referred to as pathways or protocols) in place for midwives and obstetricians to assist them in identifying women with previous mental health problems. Of the seven units that did not have guidelines, three were in the process of developing them in line with the NICE antenatal care guideline (NICE, 2003). A total of 12 units had already implemented guidelines, while another ten had none in place for such women, although in two units, these were being developed.

When asked how mental health needs were identified, all units reported that midwives were expected to ask every woman at her booking visit about her mental health history. One unit reported that women would be asked at their booking visit about their mental health history including the nature, severity, type and duration of any treatment. Of note was the variety of practice with regard to whether women were asked about their mental health needs at subsequent antenatal or postnatal contacts. In ten units, midwives were expected to ask women about their mental health needs at each subsequent antenatal contact, and five participants reported women were asked about their mental health on admission to the postnatal ward. Participants from 13 of the units reported that it was routine practice at their unit to ask women about their mental health at the first home postnatal contact after hospital discharge and 14 on discharge from midwifery care. In some units, there was clear indication that women were asked about their mental health on all of the above occasions.

When asked where information about a woman's mental health history and potential management plans were documented, it appeared that in most units this information was within a woman's hand-held record, although units also had processes for recording information on the unit's electronic records.

Screening tools to identify women at risk of mental health problems were not routinely used in pregnancy or the postnatal period by unit clinicians. Six units reported that local health visitors administered the EPDS to women who had given birth at their unit during the postnatal period, with a further three units reporting a tool was administered, but were unable to provide information about the tool used or the person who administered it. Current recommendations are that the EPDS should not be used as a routine screening tool, but may serve as a checklist alongside clinical judgement (NICE, 2006).

Referral

Although the recommendations of the Confidential Enquiries (Lewis, 2001, 2004) included that there should be a perinatal mental health specialist available for each maternity unit, it was apparent that this was not happening. Only seven of the 19 units who responded to this question had access to a specialist psychiatrist, with two of these within the South-Central SHA. In the units that did not have such a specialist, 14 reported midwives could refer women to a general psychiatrist during pregnancy and 12 reported this could happen postnatally. Most also reported that midwives, if appropriate, could refer a woman to a community psychiatric nurse (CPN), with 11 reporting referral could be made during pregnancy and 13 postnatally. Most Trusts also reported that midwives would refer women to their GP.

Ten units had a specialist midwife to whom women at risk of, or suffering from mental illness could be referred to provide a link with the multidisciplinary team and continuity of midwifery care during and after pregnancy. The specialist midwife in one Trust was a recent appointment, with another Trust reporting that their specialist midwife had counselling training, although this appeared to be the exception. Clinicians at two Trusts that did not have specialist midwives were able to refer women to a local mental health crisis team, and clinicians at another unit could refer women to a counsellor or psychologist. Of note was that a specialist midwife post in one unit had been withdrawn due to lack of funds.

When asked for further information on referral issues, one unit that did not have provision for clinicians to make direct referral to a psychiatric team, had been trying for the last 12 months to establish a referral service, but had been unable to get a positive commitment from their local mental health Trust. In another unit, specialist mental health services, had been withdrawn due to lack of funding. To make up for this loss to the service, the midwife who completed the questionnaire was developing services for vulnerable women in her own time, although she was moving on to a different post in another area.

In response to being asked who had responsibility for coordinating services for women with mental health needs, a midwife took the lead in eight units (three of whom were specialist midwives). In other instances, it was a combination of a midwife, a consultant obstetrician, psychiatrist and in some cases included the GP.

When asked what would prompt referral to a mental health specialist, all participants reported women who had symptoms of mental health problems in pregnancy or after giving birth, with 11 reporting that women would be referred during pregnancy if they had a history of such problems. In six units, women with previous mental health problems would also be referred during the postnatal period, although it was unclear exactly when this would happen or who would take responsibility for their referral. There were protocols to guide referral and management of women in 18 units, with one unit having no referral protocol and three were developing protocols. Only three units had protocols for the referral of women during pregnancy.

Designated lead for coordinating services

In most units (18), midwives and obstetricians routinely liaised with psychiatrists to plan management of women with existing problems, with one unit also organising meetings to discuss care plans once the baby was born. Five units reported this collaborative approach and two more were in the process of developing links. With regard to who had the main responsibility for care if a mother had bipolar disorder or was symptomatic of a psychotic episode, there were a variety of responses. Some units reported a multidisciplinary team would take joint responsibility, with teams including input from a midwife, GP, obstetrician, psychiatrist and CPN. One unit identified that a named midwife would coordinate care. Participants from two units felt liaison should be strengthened between healthcare professionals.

Access to mother and baby units

Although the Confidential Enquiry report (Lewis, 2004) recommended women who required psychiatric admission should be admitted to a specialist mother and baby unit, only 11 units across the two SHAs had links with a mother and baby unit, and only four of these could directly refer women. A total of 12 units had no links (one unit did not complete the question). When asked if problems had been experienced with admission of women to mother and baby units, participants from eight units reported insufficient beds could sometimes lead to lengthy waiting times. In one unit, a mother and baby could not be admitted for 24 hours to allow for a full assessment of the mother's mental state. This left the issue of who took responsibility for ensuring a woman received appropriate care and support until admission to the unit. Most did not report the number of times problems had been encountered, however, one participant reported that to her knowledge, the unit had experienced problems on two to three occasions and another on four to five occasions.

Services for women with traumatic birth

There was wide variation in the provision of services offered for women who had had a traumatic birth, with some participants referring to listening services and some to a debriefing service. Although it is recommended that women have an opportunity to talk about their birth experience, one-off formal debriefing should not be implemented (NICE, 2006). Some 17 units had some form of debriefing service in place and seven did not. There were a variety of professionals involved with providing this service, including counsellors (n=7), psychologists (n=2), consultant midwives (n=2), obstetricians (n=4) and other midwives (n=6), some units having more than one clinician involved.

Two units reported the service provided an opportunity for the woman to discuss her notes with a midwife, and others that it was an opportunity to have any concerns related to her birth experience listened to. In two units, women could make an appointment to talk to an obstetrician six weeks after the birth. It was unclear if services were offered to all women or only to those who had had a difficult

birth; six unit participants specifically reported that service information was offered to all women on discharge. One consultant midwife said that she would sometimes discuss issues for a subsequent pregnancy if a woman was still suffering psychological trauma following a previous birth.

Training in mental health issues

Both the Confidential Enquiry (Lewis 2001, 2004) and MIND (2006) reports highlighted that women did not always receive the information on mental health issues they required, and recommended the implementation of further training for healthcare professionals. A total of 17 units that responded to the survey reported some form of staff training in mental health was provided. In four London SHA units, training had been provided by a local university that had launched a mental health module in early 2007, and arranged a series of organised study days for midwives. Training in mental health issues was mandatory in five units. A range of professionals were involved in training provision, including members of the mental health team (n=3), the psychology team (n=1), practice development midwives (n=3) and one supervisor of midwives. Training provision varied from one to three days.

Future plans

Many of the 24 units acknowledged that they did not meet all recommendations for services for pregnant or postnatal women with mental health needs. However, several units had plans to develop services and guidance for staff in line with the Confidential Enquiry reports (Lewis, 2001, 2004) including the appointment of a lead professional and/or specialist midwife. Four units were developing a pathway for care. Training issues were recognised as an area that needed attention. Several units were working to develop links with local mental health services and a perinatal mental health network was being established in the South-Central SHA. Barriers to revision continued to persist; liaising with the psychiatric team was referred to as 'challenging' by several participants as was the lack of dedicated resources, which was viewed as a key obstacle to developing services.

Discussion

Although the evaluation provided an overview of the extent to which mental health services were being developed to meet the needs of women, it did not provide in-depth information about such services, or barriers to developing or sustaining them. It may be that as a semi-structured postal questionnaire was used, which included fixed response options, some questions were ambiguous or misinterpreted – a major drawback of this method of data collection (Bowling, 1997). Furthermore, as the questionnaire was specifically developed to meet the aims of this service evaluation and only achieved a 62% response rate, findings may not be 'generalisable' to other SHAs.

Nevertheless, the results have provided a 'snap-shot' of what was happening in two SHAs and confirmed findings of earlier studies as to the fragmentation and lack of appropriate resource of perinatal mental health services. The extent to which the services have been developed since the survey was completed is not known.

The findings showed wide variation in services between units and across the two SHAs. For example, one unit would report they had guidelines to identify mental health needs, an identified coordinator for services and training in place, while another would report no guidelines and inadequate liaison with mental health teams. This variation was apparent across both SHAs. However, there was only one specialist midwife in South-Central SHA and nine in the London area. Two Trusts in South-Central SHA said that midwives could not directly refer women to the mental health team in contrast to the London SHA where midwives could. Many units seemed to be working to implement some of the NICE recommendations (2003), including that all women were asked at their booking interview about personal or family history of mental health problems. However, this may suggest that implementation of less resource-intensive recommendations may be achieved (for example, ensuring all women are asked about their mental health as part of a routine consultation), while those that require more dedicated and sustained resources (for example, the appointment of a specialist midwife or liasion psychiatrist) may not be possible without dedicated funding.

Most units had guidelines to inform midwifery and obstetric care, although some were in developmental stages and it was unclear if audit of outcomes was routinely undertaken. It was reassuring that in line with national recommendations, specific screening tools were not used to identify women at risk of mental health problems in pregnancy or after giving birth. NICE (2007) recommends that a woman is asked at the first contact in both ante- and postnatal periods about past or present mental health illness, including schizophrenia, bipolar disorder, psychosis in the postnatal period and severe depression, including previous treatment from mental health services and family history of perinatal mental illness. Although all units expected midwives to ask women at their booking visit, there was variation in practice at subsequent contacts, which may reflect that current unit policies had not been revised in line with the recommendations of the Confidential Enquiry (Lewis, 2004). It is also possible that midwives viewed responsibility for asking women about mental health needs after birth within the remit of the health visitor. NICE (2007) now recommends that women with current or previous mental illness are asked about their mental health at all subsequent contacts and it would be interesting to know the extent to which this recommendation has been implemented into routine practice. Perhaps midwives feel that if they have asked a woman at the booking interview about her mental health, then there may be no further concern, despite the fact that some women will develop depression for the first time during pregnancy or after the birth (Gaynes et al, 2005).

The survey did not include questions on the role and practice of health visitors in identifying postnatal

depression, although in several units, it was reported that they administered the EPDS. It is also important to recognise that in many cultures the experience of distress is physical rather than psychological and that depression may be reported as physical symptoms such as pain, dizziness or fatigue rather than sadness (Kleinman, 2004). Training should reflect cultural aspects of mental health needs.

In addition to the need for a consistent policy on asking women about mental health needs, it is important that there are processes for referral and management if concerns are identified. Lewis (2004, 2007) recommended that there should be a specialist multidisciplinary perinatal mental health service, with clear referral and management protocols to ensure effective transfer of information and that the woman's GP should be kept informed. Although in most units there was some liasion between midwives, obstetricians and psychiatrists, and a psychiatrist would develop a plan for a woman with existing problems, this liaison was patchy in places. Two units could not directly refer women to psychiatric services and there was an apparent lack of specialists in perinatal mental health, as most units reported referral would be via the general mental health team. CPNs were involved in many, but not all instances. Less than half of the units had a specialist midwife, with only one post in the South-Central SHA. The process for referral and health professional involvement was inconsistent across the Trusts. The needs of women will vary and not all will require psychiatric input, but coordination of services for those with mental health problems was not always clearly identified. However, one London-based unit recognised the need for development in this area and had established a weekly perinatal mental health discussion group that included psychologists, social workers and those involved with substance misusers. In this instance, adult psychiatry had yet to become involved. In the most recent Confidential Enquiry (Lewis, 2007), in half of the 98 deaths discussed, assessors identified major deficiencies in communication between services and/or professionals. This included midwives not checking with GPs when a woman's previous psychiatric history was elicited, and GPs not informing midwives and obstetricians of a woman's psychiatric or substance abuse history.

The recommendations of the 2004 Confidential Enquiry (Lewis, 2004) state that women who require inpatient care for a mental health disorder within 12 months of giving birth should normally be admitted to a mother and baby unit. This service, however, was only available to around half of the Trusts and there were often bed shortages. Due to the small number of women who require admission and limited resources, it may be more appropriate to combine resources at regional level. Before this aspect of service revision could be addressed, however, there is a clear need for pragmatic trials to assess the effectiveness of such mother and baby units. This is because the longer-term consequences for the infants of women who do not receive appropriate management could be detrimental to their later development, as well as have significant implications for the woman's relationship with her child (Joy and Saylan, 2007).

The term 'debriefing' to prevent symptoms of post-traumatic stress disorder has been used to describe a number of different structured and non-structured interventions, as evidenced by studies that have investigated their effectiveness (Small et al, 2000, 2006; Ryding et al, 2004). Recent research showed no potential benefit of debriefing interventions, but other studies showed a benefit of providing women with an opportunity to talk about their pregnancy and birth experiences (Berg, 1998). There was therefore an interest in ascertaining the extent to which services for these women had been implemented, particularly given the apparent confusion about the purpose and effectiveness of non-structured interventions (Rowan et al, 2007).

The survey responses showed that listening and debriefing services were widely provided and offered a range of interventions. It was unclear from the information provided what these services comprised of, or what level of training those who provided the service had received. None of the service providers had evaluated the outcomes of this provision. A number of professionals were involved in a variety of ways and at different times in the postnatal period. NICE (2006) recommends single session debriefing should not be offered, given the potential for harm that debriefing may introduce based on general population studies (Rose et al, 2005), but it was recommended that midwives should offer and provide an opportunity for all women to ask questions about their care. The reason listening and debriefing services have become relatively common in the maternity services in the two SHAs, which is likely to reflect the situation elsewhere, is unclear and the role, provision and outcomes of such services should be evaluated as a matter of urgency.

Despite the recommendation that local clinician training in mental health matters should be improved, there was considerable variation in the timing, content and provision of training for midwives, which was only mandatory in five Trusts. If midwives are to identify and support women with mental health needs, it is important they feel confident, they have the knowledge and skills to approach the subject, are aware of the signs and symptoms, have training in methods of asking direct questions to elicit information and are familiar with referral pathways when problems are identified. Local primary care Trusts and NHS Trusts should work with universities who provide midwifery programmes to ensure there is appropriate provision of pre- and post-qualification education on maternal mental health.

Conclusion

Following the 2001 and 2004 Confidential Enquiries (Lewis 2001, 2004) and national policy recommendations (Department of Health, 2004), many units had attempted to revise services to meet the needs of women with mental health needs, including the development of guidelines, pathways and protocols to inform clinical management. Based on data from two SHAs, it is clear that there is a long way

to go before policy recommendations are fully integrated into practice and continued uncertainty that revisions can be sustained. Access to mental health services, particularly for women with severe mental health problems, will still depend to some extent on the locality in which she lives and whether there is local clinical interest in such issues. The 2007 Confidential Enquiry (Lewis, 2007) identified that although there had been a reduction in the number of women taking their own lives, clear problems remained with the identification of risk in early pregnancy and appropriate management of that risk.

The report suggested that although not all deaths from suicide could have been predicted, there were many cases in which the seriousness of the condition was not appreciated and subsequently, the timing and nature of interventions was less than optimum (Lewis, 2007). It is likely that without dedicated funding and ongoing staff development, Trusts will struggle to implement policy recommendations in full, despite the urgent need to ensure women and their families have timely access to the most appropriate care.

The second part of this study will report on in-depth interviews with individuals from two selected maternity units to determine more clearly the opportunities and barriers to the development of services for women with mental health needs during childbirth.

References

Berg M, Dahlberg K. (1998) A phenomenological study of women's experiences of complicated childbirth. *Midwifery* **14(1)**: 23-9.

Bowling A. (1997) *Research methods in health: investigating health and health services*. Open University Press: Buckingham.

Chaudron L, Pies R. (2003) The relationship between postpartum psychosis and bipolar disorder. *Review J of Clinical Psychiatry* **64(11)**: 1292-4.

Department of Health. (2004) *National Service Framework for children, young people and maternity services*. The Stationery Office: London.

Dunkley-Bent J. (2004) A consultant midwife's community clinic. *British Journal of Midwifery* **12(3)**: 144-71.

Gaynes BN, Gavin N, Meltzer-Brody S, Lohr KN, Swinson T, Gartlehner G, Brody S, Miller WC. (2005) *Perinatal depression: prevalence, screening accuracy, and screening outcomes (evidence report/technology assessment: number 119)*. Agency for Healthcare Research and Quality: Rockville, Maryland.

Gibbon K. (2004) Developments in perinatal mental health assessments. *British Journal of Midwifery* **12(12):** 754-60.

Jones I, Craddock N. (2001) Familiarity of the puerperal trigger in bipolar disorder: results of a family study. *American Journal of Psychiatry* **158:** 913-7.

Joy CB, Saylan M. **(2007)** Mother and baby units for schizophrenia: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 1**: CD006346. John Wiley and Sons: Chichester.

Kleinman A. (2007) Culture and depression. *New England Journal of Medicine* **351(10)**: 951-3.

Lewis G. (2001) *The Confidential Enquiry into Maternal and Child Health. Why mothers die 1997 to 1999. The fifth report of the Confidential Enquiries into Maternal Deaths in the United Kingdom*. RCOG Press: London.

Lewis G. (2004) *The Confidential Enquiry into Maternal and Child Health. Why mothers die 2000 to 2002. The sixth report of the Confidential Enquiries into Maternal Deaths in the United Kingdom*. RCOG Press: London.

Lewis G. (2007) *The Confidential Enquiry into Maternal and Child Health. Saving mothers' lives: reviewing maternal deaths to make motherhood safer 2003 to 2005. The seventh report of the Confidential Enquiries into Maternal Deaths in the United Kingdom*. CEMACH: London.

MIND. (2006) *Out of the blue? Motherhood and depression*. See: www.mind.org.uk/NR/rdonlyres/C07D9100-073F-412A-85EE-56CAB-CD74665/0/OutofBlueFinal.pdf (accessed 13 November 2008).

Murray L, Cooper P. (1997) Postpartum depression and child development. *Psycho Med* **27:** 253-60.

National Institute for Health and Clinical Excellence. (2003) *Routine care for the healthy pregnant woman*. NICE: London.

National Institute for Health and Clinical Excellence. (2006) *Routine postnatal care for women and their babies*. NICE: London.

National Institute for Health and Clinical Excellence. (2007) *Antenatal and postnatal mental health*. NICE: London.

National Screening Committee. (2006) *UK National Screening Committee's policy positions*. See: www.library.nhs.uk/screening (accessed 11 November 2008).

O'Connor TG, Heron J, Golding J, Beveridge M, Glover V. (2002) Maternal antenatal anxiety and children's behavioural/emotional problems at four years: report from the ALSPAC. *British Journal of Psychiatry* **180**: 502-8.

Oluwato O, Freidman T. (2005) A survey of specialist perinatal mental health services in England. *Psychiatric Bulletin* **29**: 177-9.

Rose S, Bisson J, Churchill, R. Wessely S. (2005) Psychological debriefing for preventing post-traumatic stress disorder (PTSD). In Cochrane Database Syst Rev. *The Cochrane Library* **Issue 2:** CD000650. John Wiley and Sons: Chichester.

Ross-Davies M, Elliott S, Sarkar A, Green L. (2006) Public health role in perinatal mental health: are midwives ready? *British J of Midwifery* **14(6)**: 330-4.

Rowan C, Bick D, Bastos MH. (2007) Postnatal interventions to prevent mental health problems after birth: the gap between the evidence and UK midwifery practice and maternity policy. *World Views on Evidence-Based Nursing* **4(2)**: 97-105.

Ryding EL, Wiren E, Johansson G, Ceder B, Dahlstrom AM. (2004) Groupcounselling for mothers after emergency caesarean section: a randomised controlled trial of intervention. *Birth* **31(4)**: 247-53.

Small R, Kumley J, Donohue L, Potter A, Waldenstrom U. (2000) Randomised controlled trial of midwife-led debriefing to reduce maternal depression after operative childbirth. *British Medical Journal* **321(7268)**: 1043-7.

Small R, Lumley J, Toomey L. (2006) Midwife-led debriefing after operative birth: four- to six-year follow-up of a randomised trial. *BioMed Central* **4(3)**: 1-9.

Sullivan A, Raynor M, Oates M. (2003) Why mothers die: perinatal mental health. *British J of Midwifery* **11(5)**: 310-2.

Tully L, Garcia J, Davidson L. Marchant S. (2002) Role of midwives in depression screening. *British J of Midwifery* **10(6)**: 374-8.

Eliciting women's preferences for maternity care using choice experiments: a methodological review

Bernie Reid *[1] MSc, PgCertTHE, BSc, RGN, RM, RPHN.* ***Marlene Sinclair*** *[2] PhD, MEd, DASE, BSc, RNT, RM, RN.* ***Owen Barr*** *[3] PhD, MSc, BSc, RGN, RNMH, CNMH, RNT.* ***Frank Dobbs*** *[4] MB, BA, MD, FRCP.* ***Grainne Crealey*** *[5] PhD, MSc, BSc.*

1 Research student, Institute of Nursing Research, University of Ulster at Magee, Londonderry BT48 7JE Northern Ireland. Email: reid-b@email.ulster.ac.uk
2 Professor of midwifery research, University of Ulster at Jordanstown, Newtonabbey BT37 0QB Northern Ireland. Email: m.sinclair1@ulster.ac.uk
3 Head of the School of Nursing, University of Ulster at Magee, Londonderry BT48 7JL Northern Ireland. Email: o.barr@email.ulster.ac.uk
4 Director of the Institute of Postgraduate Medicine and Primary Care, University of Ulster at Coleraine, Londonderry BT52 1SA Northern Ireland. Email: f.dobbs@email.ulster.ac.uk
5 Health economist, Clinical Research Support Centre, Royal Belfast Hospitals, Grosvenor Road, Belfast BT12 6BA Northern Ireland. Email: grainne.crealey@crsc.n-i.nhs.uk

Abstract

Background. Existing evidence suggests that women's preferences for childbirth interventions have largely been overlooked despite initiatives aimed at promoting evidence-based women-centred maternity care. Choice experiments provide a research methodology to explore such preferences.
Aim. To perform a review of choice experiment methodology and explore its use within the context of maternity care.
Method. Choice experiment methodology is analytically described and some key methodological issues are considered. Key stages in the design and analysis of choice experiments are outlined. Strengths and limitations of choice experiments are discussed and their potential future use in midwifery research explored.
Implications. Midwives are challenged to embrace the use of choice experiments in exploring women's preferences for maternity care interventions.

Key words: Choice experiments, women's preferences, maternity care, midwifery research

Introduction

Evidence-based practice has become an increasingly articulated priority for all healthcare professionals, including midwives. Evidence-based midwifery requires that midwives use 'their own professional expertise and experience to make full use of knowledge gained through critical appraisal of research evidence' (Sinclair and Ratnaike, 2007: 66). Recent guidance from the National Institute for Health and Clinical Excellence (NICE) has suggested that in appraising research evidence that may improve practice, midwives should seek to ensure not only that any maternity care intervention has known benefits, but also that the intervention is acceptable to women (NICE, 2008). Indeed, incorporating women's preferences into planning and delivering women-centred maternity care is the centrepiece of recent policy initiatives (Department of Health, 2007).

However, while very valuable research has focused on the potential clinical benefits of specific maternity care interventions in terms of, for example, a reduction in the incidence of postpartum haemorrhage or maternal deaths avoided (World Health Organization, 1999; Mousa and Alfirevic, 2003; Gulmezoglu et al, 2004; Rizvi et al, 2004), there has been a tendency to overlook women's preferences for such interventions (Petrou and Henderson, 2003). In an attempt to redress this imbalance, there has been a growing interest in the development and application of research methodologies that evaluate women's preferences for specific maternity care interventions.

Multi-attribute valuation (MAV) techniques can be used to quantify women's preferences for specific maternity care interventions by analysing their stated choices about how they would behave in hypothetical but realistic situations (Louviere, 1994). In selecting any such approach, researchers must take into consideration not only its strengths and limitations, but also the research question being addressed (Drummond et al, 2005).

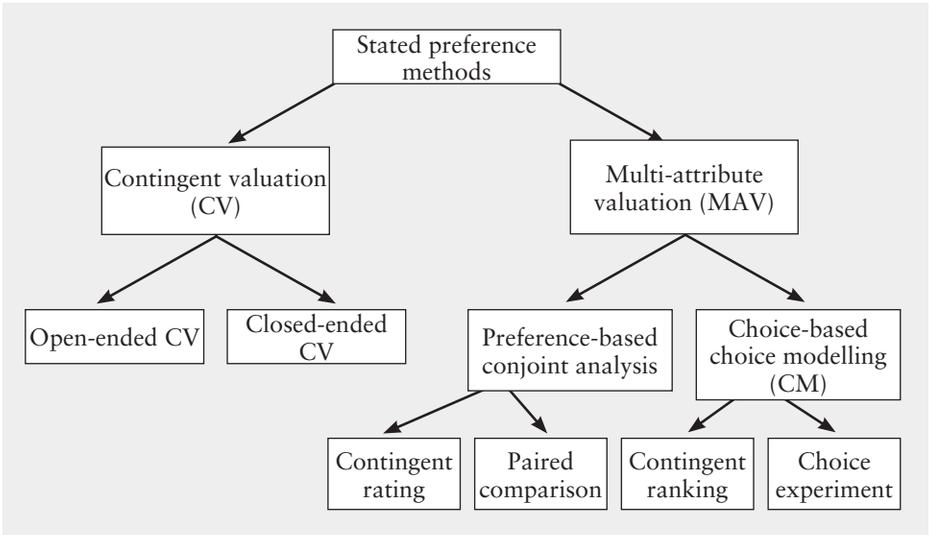
The purpose of this paper is to perform a review of choice experiment methodology and explore its use within the context of maternity care. The paper provides a descriptive analysis of choice experiment methodology and outlines the choice experiment method – an empirical published example is used to illustrate key points. The strengths and limitations of choice experiments are also highlighted. The paper closes with a discussion of the potential application of choice experiments in midwifery research.

Methodology

Individuals' preferences can be elicited using either revealed preference data or stated preference data. Revealed preference data may be used to gain insight into individuals' preferences for goods or services in real choice situations. Louviere et al (2000) point out, however, that other situations may require estimating demand for novel goods or services that may not yet exist and for which it is necessary to gain insight into individuals' preferences from other sources. A range of stated preference techniques have therefore been developed to elicit individuals' preferences by presenting respondents with hypothetical scenarios in which they are asked to rank, rate or choose between alternatives, or in the case of contingent valuation, to express a maximum willingness-to-pay (WTP) or minimum willingness-to-accept for a hypothetical change in the provision of that good. Stated preference approaches can therefore be categorised as MAV or contingent valuation (CV) (see Figure 1).

MAV techniques are a family of survey-based methodologies

Figure 1. Taxonomy of stated preference methods proposed by Merino-Castello (2003)



for modelling preferences for goods or services, where goods or services are described in terms of their attributes and the levels that these attributes take (Merino-Castello, 2003). MAV techniques can further be categorised as preference based or choice based. Preference-based approaches require the individual to rate or rank alternatives, whereas choice-based approaches require the individual to choose among several alternatives. More generally, preference-based approaches are labelled conjoint analysis, while choice-based approaches are termed choice modelling. A main distinction between these two approaches is that the choice-based approach originated from the discipline of economics where it has been used to value goods and services, whereas the preference-based approach originated from the marketing literature, focusing more on gaining insight into consumers' preferences rather than estimating economic values (Louviere, 1988).

Stated preference methodologies have been adopted by transport economists (Wardman, 1988), environmental economists (Probert et al, 2005) and more recently by health economists (Vick and Scott, 1998; Ryan and Farrar, 2000; Olsen and Smith, 2001; Telser and Zweifel, 2002). A scoping exercise of the literature by one of the authors (BR) points to the further use of these methodologies within the context of maternity care (see Table 1). However, there is considerable confusion as to what constitutes the difference between preference-based and choice-based approaches (Merino-Castello, 2003). Bishop et al's (2004) study, for example, which describes and compares the preferences of women and healthcare professionals for Down's syndrome screening tests, uses the term 'conjoint analysis' when in fact they are using a choice modelling or more specifically a choice experiment approach. Choice experiments are a sub-categorisation of choice modelling in which respondents are presented with a series of alternatives and asked to choose their most preferred option (Merino-Castello, 2003). The focus of this paper is on choice experiments within the context MAV rather than conjoint analysis or CV.

The conceptual microeconomic framework for MAV lies in Lancaster's characteristics theory of value (Lancaster, 1966), which assumes that an individual's utilities for goods can be broken down into utilities for composing characteristics. Individuals are presented with various alternative descriptions of a good, differentiated by their attributes and levels and are asked to rank the various alternatives, to rate them, or to choose the most preferred. By including price/cost as one of the attributes of the good, WTP can be indirectly ascertained from their rankings, ratings or choices (Merino-Castello, 2003).

One of the main differences between preference-based and choice-based approaches is the form of the utility function. Preference-based approaches use a deterministic utility function whereas a choice-based approach uses the random utility function, where the stochastic component includes all unidentified factors that affect choice. In the deterministic case, the utility function is assumed to be related to an individual's rating via a transformation function ϕ:

$U_{ij} = \phi [V_{ij} (X_{ij})]$

where: U_{ij} represents the utility of choosing alternative i over alternative j; V_{ij} is the vector of the deterministic component; X_{ij} is the vector that varies across the alternatives and ϕ denotes the standardised cumulative normal distribution.

Alternatively, choice-based approaches use the random utility function that represents the integrated behavioural theory of decision-making and choice behaviour and is composed of a deterministic component V_{ij} and a stochastic one ε_{ij}:

$U_{ij} = V_{ij}(X_{ij}) + \varepsilon_{ij}$

where: ε_{ij} is the error that captures individual and alternative specific factors that influence utility, but are not observable to the researcher.

Implicit to Lancaster's (1966) economic theory of value is the idea that in order to arrive at a specific choice, women either consciously or unconsciously have considered a set of alternatives. Moreover, it is an individual's preferences for specific key characteristics or attributes of alternatives that best determine which alternative is chosen. Thus, it is assumed that a decision can be broken down into separate key characteristics or attributes, with each attribute being further subdivided into levels. For example, women's preference for an antenatal screening test for Down's syndrome over an alternative screening test might be related to a characteristic (or attribute) of the screening test, such as the timing of the test during pregnancy, the percentage detection rate or the risk of miscarrying a pregnancy unaffected by Down's syndrome as a result of subsequent diagnostic tests (Bishop et al, 2004). Each of these attributes is further broken down into levels with, for example, women being required to choose between tests that have differing levels of accuracy (80%, 85%, 90% or 95%). By breaking each attribute down into levels, women

Table 1. Search of literature that examined preference methods in maternity care between January 1997 and October 2008

Contingent valuation (CV)	
Title of study and author/s	**Described approach**
Using willingness to pay to value alternative models of antenatal care (Ryan et al, 1997)	Closed-ended CV
Willingness to pay: a method for measuring preferences for maternity care? (Donaldson et al, 1998)	Open-ended CV
Measurement of consumer preference for treatments used to induce labour: a willingness-to-pay approach (Taylor and Armour, 2000)	Variant of open-ended CV
Assessment of demand for prenatal diagnostic testing using willingness to pay (Caughey et al, 2004)	Closed-ended CV
Measuring preferences for delivery services in rural Vietnam (Duong et al, 2005)	Variant of open-ended CV
Multi-attribute variation	
Using conjoint analysis to assess women's preferences for miscarriage management (Ryan and Hughes, 1997)	Conjoint analysis
Using conjoint analysis to take account of patient preferences and go beyond health outcomes: an application to in vitro fertilisation (Ryan, 1999)	Conjoint analysis
Assessing women's preferences for intrapartum care (Hundley et al, 2001)	Discrete choice experiment
Investigating the structural reliability of a discrete choice experiment within health technology assessment (Ratcliffe and Longworth, 2002)	Discrete choice experiment
Women and healthcare professionals' preferences for Down's syndrome screening tests: a conjoint analysis study (Bishop et al, 2004)	Conjoint analysis
Women's and health professionals preferences for prenatal testing for Down's syndrome in Australia (Lewis et al, 2006a)	Conjoint analysis
A comparison of Australian and UK obstetricians' and midwives' preferences for screening tests for Down syndrome (Lewis et al, 2006b)	Conjoint analysis

* Search terms used: Stated preference techniques/methods; contingent valuation; open-ended contingent valuation; closed valuation; multi-attribute valuation; preference based; choice based; conjoint analysis; choice modelling; contingent ranking; paired comparison; choice experiment; perinatal/maternity care; pregnant/women

Databases/journals searched: Allied and Complementary Medicine; British Nursing Index; CINAHL; EMBASE; Genetics Abstracts; MEDLINE; Ovid MyJournals; PsycInfo; Sociological Abstracts; *Health Economics*; *Journal of Health Economics*; *European Journal of Health Economics*; *Journal of Choice Modelling*; *Birth*; *Health Care for Women International*; *Journal of Advanced Nursing*; *Journal of Midwifery and Women's Health*; *Midwifery*; *Social Science and Medicine*; *Women's Health Issues*

are encouraged to trade between attribute levels when presented with choice options or scenarios (Hensher et al, 2005). 'Trading' means that women, for example, may be prepared to accept a screening test carried out later in pregnancy in compensation for a more accurate result (Bishop et al, 2004). This particular example included a 'no-test' or 'no-choice' alternative as women may choose to decline screening.

The purpose of choice experiments is to estimate utility and calculate marginal rates of substitution (MRS) between these key characteristics or attributes. Utility scores are numerical measures of how important each attribute is to an individual's overall preference for a specific intervention and is determined by the particular combination of attributes, and by women's personal characteristics. Combining the utilities for different attributes provides women's overall relative preferences for an intervention (Singh et al, 1998; Orme, 2006). The assumption is that women would prefer to choose those interventions on which they place the highest overall utility value. Marginal rates of substitution are measures of how much of an attribute an individual might be willing to give up or 'trade', in exchange for more of another attribute, while maintaining the same level of utility.

However, as choice experiments have gained popularity in maternity care and health care generally, some key methodological issues have arisen that warrant careful consideration by researchers. One such issue relates to the implicit methodological assumption of the stability of preferences over time. However, given the nature of maternity care, this assumption may be challenged. Individual women often do not have experience of maternity care and it has been recognised that preferences for specific interventions may evolve with experience resulting in flexible future preferences (Koopmans, 1964). Hence, it may be suggested that, women who have given birth to a healthy baby may express different preferences for antenatal screening tests for Down's syndrome as compared to those expressed by the same sample of women earlier in pregnancy. This hypothesis has been tested in other areas of health care, with no clear evidence being found that experience between experiments influences stability of responses (San Miguel et al, 2002). However, in the field of maternity care where women's preferences may be less stable than in other areas of health care (Petrou and Henderson, 2003), more research is needed to analyse the effect of experience on women's preferences for specific maternity care interventions.

A further methodological issue relates to the assumption that individuals provide rational responses, that is, consider all available information and make choices on the basis of maximising utility. Yet, such an assumption by-passes the emotional or affective component of choice. Indeed, it has been pointed out that actual choices made by women can be explained in terms of the interplay of two extreme paradigms: valuation by utility and valuation by feelings (Hsee and Rottenstreich, 2004). With respect to antenatal screening tests for Down's syndrome, it may be suggested that for some women the potential fear of miscarrying a baby unaffected by Down's syndrome as a result of subsequent diagnostic testing may negate them trading between attributes and consistently choosing a 'no-test' alternative. The implication for researchers is that the emotional impact of maternity care interventions should, wherever feasible, be incorporated into the design of the choice experiment (Arana et al, 2008).

The assumption that attribute levels are traded-off to

maximise utility underpins choice experiment methodology. Yet, research has contested this basic precept of economic theory by demonstrating that individuals are not always prepared to trade and so attribute levels cannot be substituted for one another (Payne et al, 1993; Sen, 1997; Swait et al, 2002; Ryan et al, 2004; San Miguel et al, 2005). In addition to emotional effects, Payne et al (1993) point to the complexity of the choice options or scenarios as potentially influencing women's willingness to trade. Choice complexity implies that individuals do not have the cognitive capacity to process multi-attribute information (Simon, 1959). The consequence is that women may use heuristics or 'rules of thumb' to simplify choice options or scenarios. These filtering rules lead to options or scenarios being chosen that are good enough, although not necessarily the best, for example, potentially always choosing the scenario where the accuracy of the screening test is 'best', and thereby avoiding the need to address the underlying issue of utility maximisation. Possible solutions to this methodological issue relate to the design of the instrument or method used to elicit preferences.

A further effect influencing women's willingness to trade relates to a very strong preference or a belief that a specific attribute is the most important (Scott, 2002). This could indicate a 'rights-based' view of choice and an ethical belief that women should be provided with a specific attribute, for example, a potential belief that women should only be offered a screening test for Down's syndrome that is not less than 95% accurate. It is this type of potential dominant preference that would render the calculation of marginal rates of substitution meaningless and present clear implications for the provision of any antenatal screening programme for Down's syndrome.

Method

The five key stages in the design and analysis of choice experiments are: identifying the attributes; assigning levels to these attributes; generating choice scenarios that incorporate different attribute levels; establishing women's preferences for these scenarios and analysing the responses (Ryan, 1999; Louviere et al, 2000; Hensher et al, 2005).

Identifying the attributes

The identification of relevant key characteristics or attributes must reflect as closely as possible the key drivers of women's choices, while also reflecting the interests of maternity care policy-makers and providers. There may be considerable information available from the policy context or from the existing literature about the set of attributes influencing women's choice about a specific maternity care intervention (Ryan and Farrar, 2000), but Hall et al (2004) suggest that researchers and policy-makers will rarely understand the attributes of interest in the way women do.

Existing literature may be used to identify an initial set of attributes, but additional research is needed to ensure that the final set of attributes will produce valid results. Focus groups and in-depth interviews can provide valuable information about how women make choices, which can inform the final choice of attributes. Moreover, extensive pilot testing, including interviews about how attributes are perceived, understood and evaluated, is also an essential component (Hall et al, 2004). Bishop et al (2004) for example, journeys some way along this path by piloting four tests (timing of screening test in pregnancy; accuracy of the test; the risk of miscarrying a pregnancy unaffected by Down's syndrome as a result of subsequent diagnostic tests; and false-positive rates) and using open-ended questions to ask women if there were any other attributes that they considered important in influencing their decisions about antenatal screening for Down's syndrome. No additional attributes were identified. Bishop et al (2004) do not offer an explanation as to why the attribute relating to false-positive rates is not included in the final study. Moreover, this study does not include cost as an attribute, which may have allowed for marginal willingness-to-pay values to be inferred for changes in the levels of the remaining attributes (Petrou and Henderson, 2003; Petrou and McIntosh, 2008). In other words, it would have been possible to determine if women placed a higher value on a screening test that had a lower risk of miscarriage of a pregnancy unaffected by Down's syndrome.

It is acknowledged that the number of attributes identified may influence choice complexity with unwillingness to trade being more likely the greater the number of attributes presented (Payne et al, 1992). Indeed, it has been suggested in the literature that an individual can only consider up to six attributes, but in practice this has ranged from two to 24 (Ryan and Gerard, 2001). Nonetheless, the argument that the number of attributes in any choice experiment should be restricted in order to overcome cognitive difficulties must be considered within the context of a counter argument, which postulates that it may be preferable to include a larger number of attributes to minimise the bias relating to missing variables (Louviere et al, 2000).

Assigning levels to the attributes

Assigning levels to the attributes involves specifying for each attribute a number of hypothetical levels or values that may be numerical or ordinal (Hensher et al, 2005). The levels of the attributes should be plausible, actionable and relevant to current experience (Ryan and Farrar, 2000), otherwise women may not take the study seriously. Most importantly, the attribute levels should be capable of being traded, in that the range of levels should provide enough variation while simultaneously being narrow enough to create competitive choices for women (Ryan, 1999). With regard to Bishop et al's (2004) study, for example, it could be suggested that the interval between the levels of the attribute relating to the timing of the screening test during pregnancy were too narrow, and as a consequence, women were unwilling to trade time for more of any other attribute.

In deciding upon the number of levels to assign within each attribute, Hensher et al (2005) suggest that the number of levels assigned does not have to be the same for each attribute, for example in Bishop et al (2004), there are four levels of each attribute. Moreover, while it is argued that more accurate information or utility for an attribute is likely to be captured by using more levels within an attribute, it is acknowledged that researchers are often forced to compromise in terms of the number of levels used not only to reduce

choice complexity but also for practical reasons (cost and time) (Hensher et al, 2005).

Generating choice scenarios with different attribute levels

The discrete choice experiment presents women with a series of hypothetical 'options' or 'scenarios' created by combining different levels of each attribute. The term 'scenario' may be used interchangeably with the term 'choice set' and is described as a collection of intervention alternatives from which women may choose (Hensher et al, 2005; Orme, 2006). As the number of attributes and levels increase, so does the number of possible scenarios. However, it is unusual and almost rare for all of the scenarios generated (that is, the complete factorial design) to be presented to all women (Ryan and Farrar, 2001). Using the three attributes chosen by Bishop et al (2004), each with four levels, creates 64 possible scenarios or choice sets. Prior research suggests that it is unrealistic to expect women to complete this number of scenarios without becoming bored or unwilling to trade, and that no more than 16 scenarios can be completed before the responses start to become less reliable (Malhotra and Birks, 2000). Therefore, the researcher must simplify the process by using a fraction of the full set of scenarios. Furthermore, the subset of scenarios provided must be balanced (that is, each level of the attribute appears the same number of times) and orthogonal (that is, there is no correlation among levels across attributes).

Establishing preferences

In choice experiments, women's preferences for scenarios are usually collected via a survey where they are asked to choose among intervention scenarios rather than being asked to rate or rank scenarios (as can be the case in other choice- or preference-based approaches). Such an approach is considered reflective of the way in which women made choices in real life maternity care (Ryan and Farrar, 2001). Nonetheless, women should be instructed to treat each scenario as an independent choice, that is, each scenario should be treated as a separate hypothetical situation and not considered in conjunction with other scenarios (Hensher et al, 2005). Thus, women are asked to make choices about scenarios without other scenarios in mind, and not to return to already completed scenarios and make change choices in light of decisions made in subsequent scenarios. Paper and pencil surveys are likely to allow women to observe all scenarios simultaneously, but the programming of some computer and internet surveys may help to determine the reliability of the method by allowing for the viewing of only one pair of scenarios at a time and preventing women returning to previous screens (Hensher et al, 2005). Such programmes may be used to incorporate tests of consistency, to assess whether women always chose the same alternatives when presented with identical scenarios and to assess whether they always chose the alternative with the 'best' level of a particular attribute (Scott, 2002).

Many issues arise when determining the sample size for a choice experiment, including the intervention being measured; the strength of the differences between the attributes; the homogeneity of women to be included; and the number of scenarios that each woman is to be presented with. Although no specific sample size power calculator for choice experiments exist, a rule of thumb that uses the formula (n x t x a/c) ≥ 500, where n equals the number of women participating, t equals the number of scenarios, a equals the number of choices per scenario (excluding the none option), and c equals the largest number of levels for any one attribute (Orme, 2006). Thus, in a study where each woman is asked to complete ten scenarios (t), with four choices per scenario (a), and the largest number of levels for any one attribute is five (c), the sample size calculation is (n x 10 x 4/5) ≥ 500. The minimum sample size is therefore 63 women.

Analysing the responses

In a choice experiment, respondents are presented with a choice of scenarios and are asked to choose their preferred alternative in each case. This process is repeated a number of times for each respondent. The data are then coded and econometric techniques used to determine individuals' preferences. For choice-based approaches, the multinomial logit is appropriate and the estimation procedure is maximum likelihood. Due to differences in the measurement scale, the model specification for choice experiments is McFadden's conditional logit. It is thought that this approach gives welfare-consistent estimates, as this forces individuals to trade changes in attribute levels against the cost of these changes (Merino-Castello, 2003).

Strengths and limitations of choice experiments

It is recognised that women's choices concerning maternity care interventions are complex and multi-dimensional in nature (Harding, 2000). Choice modelling is particularly suited to analysing such choices, because of its natural ability to identify their key characteristics or attributes and to measure or 'tease out' the value placed by women upon each of these attributes, typically supplied in combination with one another. This may provide maternity care policy-makers and providers with a deeper understanding of women's decision-making processes (Hanley et al, 2001). Arguably, the main limitation of choice modelling lies with the cognitive difficulty associated with multiple complex choices. Both experimental economists and psychologists have found ample evidence that there is a limit to how much information an individual can meaningfully handle while making a decision (Mazotta and Opaluch, 1995; Swait and Adamowicz, 1996; Foster and Mourato, 1997). Hence, the choice of attributes, number of levels, and the way in which choice scenarios are presented to women should be carefully considered as such factors may impact on both utility scores and willingness to trade (Hanley et al, 2001). Other considerations such as the timing of the experiment (during pregnancy), choice of population (women of childbearing age, pregnant women, and so on) and presentation method (face-to-face interview, internet-based survey, and so on) may all affect the accuracy of the information generated. A number of possible solutions to such a limitation have previously been outlined in this paper.

Application to midwifery research

Midwives are called upon to provide an evidence base for practice and deploy scarce resources efficiently in an

increasingly complex maternity care system. Women's choice or decision-making processes about future or existing maternity care interventions; participation in, and satisfaction with, interactive decision-making processes; and WTP; all together with the role of technology in studying such preferences are a few areas ripe for midwifery research using choice experiments.

Choice experiments can be used to predict the uptake of a new maternity care services or re-configure existing services. This is particularly important where no preference information exists and where uptake is a crucial factor in the success of an intervention. Moreover, this method will clarify how changing attribute levels affect uptake, thus allowing policymakers to maximise uptake and to assess the costs and outcomes of alternative strategies.

Maternity care decision-making is characterised by a complex interaction between women and midwives or other healthcare professionals, with women often relying on expert knowledge about intervention options. Thus, decision-making becomes an interactive process. Choice modelling can allow these decision-making processes to be investigated, by having women's preferences as an attribute in the scenarios provided to midwives and other healthcare professionals and expert advice as an attribute presented to women. Indeed, such studies have shown that women's and healthcare professionals' valuations are likely to be at variance. This is illustrated in a study in which Lewis et al (2006a) used a choice experiment to describe and compare women's and healthcare professionals' preferences for antenatal screening for Down's syndrome. The 'risk' of miscarrying a pregnancy unaffected by Down's was considered – by both women and healthcare professionals – to be the most important attribute of a screening test. Nevertheless, in making comparisons between these two groups, it was found that healthcare professionals expressed a preference for earlier screening than women did, whereas safety was deemed more important by women than healthcare professionals. Such findings are important to consider with the current and potential screening options available in antenatal care.

Choice experiments may require women to understand technical aspects of maternity care interventions, such as in vitro fertilisation (Ryan, 1999) and antenatal screening research (Bishop et al, 2004; Lewis et al, 2006a) where women need information about timing, success rates, risk and safety. However, these choices that women actually face in a maternity care system are often driven by increasing technological developments. Ensuring that information provided is comprehensible and that choices in surveys are realistic and meaningful will reduce the variability in responses and increase the accuracy of utility estimates (Hanley et al, 2001).

WTP estimates have not been used in maternity care evaluation, partly because most women are unfamiliar with the real costs of maternity care or the benefits of specific interventions. However, with careful wording and interpretation, asking about WTP within a choice experiment could provide an indication of the value that women place on a specific intervention.

Conclusion

Stated preference techniques, such as MAV (and more specifically choice experiments) is a well-established methodology in marketing, transport, environmental economics and other areas of health care. Notwithstanding some issues meriting further methodological enquiry, this methodology has the potential to evaluate women's preferences for maternity care interventions and thus fill a gap in the existing research evidence. This will enable woman-centred maternity care services to be developed and delivered that have women's preferences at their core. This could contribute to more efficient and equitable provision of maternity care services that takes into account the preferences of women. Indeed, in striving to ensure women-centred care, greater understanding of women's preferences and their ensuing choices for maternity care interventions seem imperative.

References

Arana JE, Carmelo JL, Hanemann MW. (2008) Emotions and decision rules in discrete choice experiments for valuing healthcare programmes for the elderly. *Journal of Health Economics* **27(3)**: 753-69.

Bishop AJ, Marteau TM, Armstrong, D, Chitty LS, Longworth L, Buxton MJ, Berlin C. (2004) Women and healthcare professionals' preferences for Down's syndrome screening tests: a conjoint analysis study. *British Journal of Obstetrics and Gynaecology* **111:** 775-9.

Caughey AB, Washington E, Gildengorin V, Kuppermann M. (2004) Assessment of demand for prenatal diagnostic testing using willingness to pay. *Obstetrics and Gynecology* **3(3)**: 539-45.

Department of Health. (2007) *Maternity matters: choice, access and continuity of care in a safe service*. Department of Health: London.

Donaldson C, Hundley V, Mapp T. (1998) Willingness to pay: a method for measuring preferences for maternity care? *Birth* **25(1)**: 32-9.

Drummond MF, Sculpher MJ, Torrance GW, O'Brien BJ, Stoddart GL. (2005) *Methods for the economic evaluation of healthcare programmes (third edition)*. Oxford University Press: Oxford.

Duong DV, Lee AH, Binns CW. (2005) Measuring preferences for delivery services in rural Vietnam. *Birth* **32(3)**: 194-202.

Foster V, Mourato S. (1997) *Behavioural consistency, statistical specification and validity in the contingent ranking method: evidence from a survey on the impacts of pesticide use in the UK*. CSERGE Working Paper 97-09.

Gulmezoglu AM, Forna F, Villar J, Hofmeyr GJ. (2004) Prostaglandins for prevention of postpartum haemorrhage: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 1:** CD000494. John Wiley and Sons: Chichester.

Hall J, Viney, R, Haas M, Louviere J. (2004) Using stated preference discrete choice modeling to evaluate healthcare programs. *Journal of Business Research* **57(9)**: 1026-32.

Hanley N, Mourato S, Wright RE. (2001) Choice modelling approaches: a superior alternative for environmental valuation? *Journal of Economic Surveys* **15(3)**: 435-62.

Harding D. (2000) *Making choices in childbirth*: In: Page LA. (Ed). *The new midwifery: science and sensitivity in practice*. Churchill Livingstone: London: 71-85.

References continued

Hensher DA, Rose JM, Greene WH. (2005) A*pplied choice analysis: a primer*. Cambridge University Press: Cambridge.

Hsee CK, Rottenstreich Y. (2004) Music, pandas and muggers: on the affective psychology of value. *Journal of Experimental Psychology* **133(1)**: 23-30.

Hundley V, Ryan M, Graham W. (2201) Assessing women's preferences for intrapartum care. *Birth* **28(4)**: 254-63.

Koopmans TC. (1964) *On flexibility of future preference:* In: Maynard S, Glenn B. (Eds.). *Human judgements and optimality*. Wiley: New York: 243-54.

Lancaster K. (1966) A new approach to consumer theory. *Journal of Political Economy* **74(2)**: 132-57.

Lewis SM, Cullinane FM, Carlin JB, Halliday JL. (2006a) Women's and health professionals preferences for prenatal testing for Down syndrome in Australia. *Aust NZ J Obstet Gynaecol* **46:** 205-11.

Lewis SM, Cullinane FN, Bishop AJ, Chitty LS, Marteau TM, Halliday JL. (2006b) A comparison of Australian and UK obstetricians' and midwives' preferences for screening tests for Down syndrome. *Prenatal Diagnosis* **26(1)**: 60-6.

Louviere J. (1988) *Analysing decision-making: metric conjoint analysis*. Sage: Newbury Park, California.

Louviere J. (1994) *Relating stated preference measures and models to choices in real markets*. Paper presented at DOE/EPA Workshop on Using Contingent Valuation to Measure Non-Market Values, Herndon, Virgina.

Louviere J, Hensher D, Swait J. (2000) *Stated choice methods: analysis and application*. Cambridge University Press: Cambridge.

Malhotra NK, Birks DF. (2000) *Marketing research: an applied orientation*. Pearson Education Limited: Harlow.

Mazotta M, Opaluch J. (1995) Decision-making when choices are complex. *Land Economics* **71(4)**: 500-15.

Merino-Castello A. (2003) *Eliciting consumers preferences using stated preference discrete choice models: contingent ranking versus choice experiment*. UPF Economics and Business Working Paper 705: Barcelona.

Mousa HA, Alfirevic Z. (2003) Treatment for primary postpartum haemorrhage: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 1**: CD003249. John Wiley and Sons: Chichester.

National Institute for Health and Clinical Excellence. (2008) *Antenatal care: routine care of healthy pregnant women*. NICE: London.

Olsen JA, Smith RD. (2001) Theory versus practice: a review of 'willingness-to-pay' in health and health care. *Health Economics* **10(1)**: 39-52.

Orme BK. (2006) *Getting started with conjoint analysis: strategies for product design and pricing research*. Research Publishers LLC: Madison.

Payne JW, Bettman JR, Johnson EJ. (1992) Behavioural decision research: a constructive processing perspective. *Annual Review of Psychology* **43**: 87-131.

Payne JW, Bettman JR, Johnson EJ. (1993) *The adaptive decision-maker*. Cambridge University Press: Cambridge.

Petrou S, Henderson J. (2003) Preference-based approaches to measuring the benefits of prenatal care. *Birth* **30(4)**: 217-26.

Petrou S, McIntosh E. (2008) Measuring the benefits of growth hormone therapy in children: a role for preference based approaches? *Archives of Disease in Childhood* **93(2)**: 95-7.

Probert EJ, Dawson EF, Cockrill A. (2005) Evaluating preferences within the composting industry in Wales using a conjoint analysis approach. *Resources, Conservation and Recycling* **45(2)**: 128-41.

Ratcliffe J, Longworth L. (2002) Investigating the structural reliability of a discrete choice experiment within health technology assessment. *International Journal of Technology Assessment in Health Care* **18(1)**: 139-44.

Rizvi F, Mackey R, Barrett T, McKenna P, Geary M. (2004) Successful reduction of massive postpartum haemorrhage by use of guidelines and staff education. *British Journal of Obstetrics and Gynaecology* **111**: 495-8.

Ryan M. (1999) Using conjoint analysis to take account of patient preferences and go beyond health outcomes: an application to in vitro fertilisation. *Social Science and Medicine* **48(4)**: 535-46.

Ryan M, Farrar S. (2000) Using conjoint analysis to elicit preferences in health care. *British Medical Journal* **320**: 1530-3.

Ryan M, Gerard K. (2001) *Using discrete choice experiments to value healthcare programmes: current practice and future challenges*. Paper presented at Third International Health Economics Association, University of York, York.

Ryan M, Hughes J. (1997) Using conjoint analysis to assess women's preferences for miscarriage management. *Health Economics* **6(3)**: 261-73.

Ryan M, Ratcliffe J, Tucker J. (1997) Using willingness to pay to value alternative models of antenatal care. *Social Science and Medicine* **44(3)**: 371-80.

Ryan M, Scott DA, Donaldson C. (2004) Valuing health care using willingness to pay: a comparison of the payment card and dichotomous choice methods. *Journal of Health Economics* **23(2)**: 237-58.

San Miguel F, Ryan M, Scott A. (2002) Are preferences stable? The case of health care. *Journal of Economic Behaviour and Organisation* **48(1)**: 1-14.

San Miguel F, Ryan M, Amaya-Amaya M. (2005) Irrational stated preferences: a quantitative and qualitative investigation. *Health Economics* **14(3)**: 307-22.

Sen A. (1997) Maximization and the act of choice. *Econometrica* **65(4)**: 745-79.

Scott A. (2002) Identifying and analysing dominant preferences in discrete choice experiments: an application in health care. *Journal of Economic Psychology* **23(3)**: 383-98.

Simon HA. (1959) Theories of decision-making in economics and behavioural sciences. *American Economic Review* **49(3)**: 253-83.

Sinclair M, Ratnaike D. (2007) Writing for evidence based midwifery. *Evidence Based Midwifery* **5(2)**: 66-70.

Singh J, Cuttler L, Shin M, Silvers JB, Neuhauser D. (1998) Medical decision-making and the patient: understanding preference patterns for growth hormone therapy using conjoint analysis. *Medical Care* **36(Supplement 8)**: AS31-AS45.

Swait J, Adamowicz V. (1996) The effect of choice environment and task demands on consumer behaviour. Paper to 1996 Canadian Resource and Environmental Economics Study Group, Montreal.

Swait J, Adamowicz V, Hanemann M, Diederich A, Krosnick J, Layton D, Provencher W, Schkade D, Tourangeau R. (2002) Context dependence and aggregation in disaggregate choice analysis. *Marketing Letters* **13(3)**: 195-205.

Taylor SJ, Armour CL. (2000) Measurement of consumer preference for treatments used to induce labour: a willingness-to-pay approach. *Health Expectations* **3(3)**: 203-16.

Telser H, Zweifel P. (2002) Measuring willingness-to-pay for risk reduction: an application of conjoint analysis. *Health Economics* **11(2):** 129-39.

Vick S, Scott A. (1998) Agency in health care: examining patient's preferences for attributes of the doctor-patient relationship. *Journal of Health Economics* **17(5)**: 587-605.

Wardman M. (1988) A comparison of revealed preference and stated preference models. *Journal of Transport Economics and Policy* **22(1)**: 71-91.

World Health Organization. (1999) *Reduction of maternal mortality: a joint WHO/UNFPA/UNICEF/World Bank statemen*t. World Health Organization: Geneva.

Steen M, Kingdon C. (2008) Breech birth: Reviewing the evidence for external cephalic version and moxibustion. *Evidence Based Midwifery* **6(4)**: 126-129

Breech birth: reviewing the evidence for external cephalic version and moxibustion

Mary Steen[1*] *PhD, MCGI, PG Dip HE, PGCRM, BHSc, RM, RGN.* *Carol Kingdon*[2] *PhD, MA, BA.*

1 Midwife and senior researcher, Leeds Teaching Hospitals NHS Trust, Community Midwifery Services, St James' University Hospital, Beckett Street, Leeds LS9 7TF England. Email: mary.steen@chester.ac.uk

2 Research fellow, University of Central Lancashire, Preston, Lancashire PR1 2HE England. Email: ckingdon@uclan.ac.uk

*Mary Steen has recently taken up the post of reader in midwifery and reproductive health at the University of Chester, Parkgate Road, Chester CH1 4BJ England.

Abstract

Background. Breech presentation, where a baby is buttocks or feet first rather than head occurs in about 3% to 4% of singleton pregnancies at term. Worldwide, the majority of babies identified as breech are now delivered by planned caesarean section.

Aim. This paper is the second of two that reviews evidence concerning breech presentation and birth mode. This review focuses specifically on women's preferences for birth mode, experiences of breech presentation and the use of external cephalic version (ECV) and moxibustion, which may be used in the third trimester of pregnancy to turn a breech baby to a cephalic presentation.

Methods. A structured literature review was undertaken using the Cochrane Library, CINAHL, EMBASE, MEDLINE and AMED. Different permutations of 'breech' ('frank' or 'complete' or 'extended' or 'flexed') and 'alternative' or 'complementary therapies' or 'external cephalic version' or 'ECV' or 'moxibustion' and 'before term' and 'term' and 'singleton' in the title, key words or abstract were used.

Results. There is evidence that the majority of women would prefer a vaginal birth. There is substantial evidence that ECV can reduce the caesarean section rate by turning breech presentation to cephalic. Further research is needed to confirm or refute the clinical effectiveness and women's views of moxibustion therapy.

Conclusions. As rates of caesarean section for breech presentation continue to rise, it is important that midwives and women have up-to-date evidence-based information about the alternative to proceeding straight to planned caesarean section when a breech presentation is identified.

Key words: Breech, caesarean section, moxibustion, ECV, alternative or complementary therapies, women's views

Introduction

Breech presentation, where a baby is buttocks or feet first rather than head occurs in about 3% to 4% of singleton pregnancies at term (Royal College of Obstetricians and Gynaecologists (RCOG), 2006a). The first paper in this two-part series reviewing the research evidence around breech birth identified that women with a breech presentation at term are most likely to birth by planned caesarean section (CS) (Steen and Kingdon, 2008). It reviewed the evidence and controversy surrounding the likelihood of this occurring and how, following the publication of the Term Breech Trial (TBT) (Hannah et al, 2000), obstetric practice worldwide was transformed to routine planned CS for breech presentation (Hogle et al, 2003; Phipps et al, 2003; Roberts et al, 2004; Reilberg et al, 2005; Turner, 2006; Glezerman, 2006).

There is evidence to suggest that a breech presentation is associated with higher risks than a cephalic presentation (Albrechtsen et al, 1998; Broche et al, 2005). At present, there are two methods available, which have the potential to turn a breech presentation around to a cephalic position and reduce the risk of CS. The first and more available method is external cephalic version (ECV), which is the manipulation of the baby, through the mother's abdomen to a cephalic presentation. Over the last 50 years, there has been an increasing trend towards women having a CS when a breech presentation has been diagnosed as a preventive way of reducing the poor outcomes associated with breech presentation (Alarab et al, 2004). Moxibustion therapy can also be used as a preventive way to reduce the incidence of this. It is, therefore, important for midwives to have in-depth knowledge and an understanding of alternative methods that may help reduce the frequency of breech presentation at term. A good knowledge base and understanding of the risks and benefits of alternative methods will help midwives to discuss the choices and options available to women. Midwives also need to be involved in developing local policies and services that will provide choices and options for women who present as a breech.

Search strategy

Relevant published literature was identified by systematically searching *The Cochrane Library* (Issue 1, 2008), CINAHL (1982 to 2008 week 5), EMBASE (1980 to 2008 week 5)

and MEDLINE (1950 to 2008 week 5) and AMED (1985 to February 2008). Different permutations of 'breech' ('frank' or 'complete' or 'extended' or 'flexed') and 'alternative' or 'complementary therapies' or 'external cephalic version' or 'ECV' or 'moxibustion' and 'before term' and 'term' and 'singleton' in the title, key words or abstract were used.

The search strategy was specifically designed to identify research studies and commentary papers relating to women's preferences, experiences, the use of ECV and moxibustion to turn a breech presentation to a cephalic presentation.

The search strategy identified a total of 681 articles of which 283 abstracts were reviewed independently by the authors and 239 were excluded. A total of 44 potential papers were identified: four Cochrane reviews, eight systematic or structured reviews, ten reporting the findings of randomised controlled trials (RCTs), 16 prospective studies, two retrospective studies and four commentary papers. The authors read all of these papers and a further 12 were excluded as their focus was not on breech birth. A further four papers were identified through reference lists and hand-searching, thus a total of 36 papers were reviewed. The studies identified varied in their quality and the best available evidence was provided by the Cochrane reviews and systematic/structured reviews.

This paper will discuss and explore the evidence relating to women's preferences and experiences of breech birth and the clinical implications of ECV and moxibustion therapy to reduce the incidence of breech presentation. Considerably less literature was identified from the search regarding moxibustion compared with either women's views of birth mode in general or ECV specifically.

Women's preferences and experiences of vaginal and caesarean birth

Three systematic literature reviews of studies focusing on women's choice of or preference for CS have shown that the majority of women would prefer a vaginal birth (Gamble and Creedy, 2000; Kingdon et al, 2006; McCourt et al, 2007). However, since the publication of the TBT (Hannah et al, 2000), many women with a fetus in the breech presentation are limited to two options: to proceed straight to elective CS or to attempt ECV. Despite evidence from well-designed RCTs of the effectiveness of ECV to reduce non-cephalic presentation the incidence of ECV remains low. One purported explanation for the low uptake of ECV is that it is not acceptable to women. One survey of pregnant women (of any gestation, not necessarily breech) reports that when a full explanation of ECV was given, including the probability of success and the potential risks, 82% of women stated that they would choose ECV rather than proceed directly to elective CS if their baby was in the breech presentation (Leung et al, 2000). In the same study, when only a brief description of ECV was offered, only 57% of these women said that they would choose ECV. Thus suggesting that it is the quality of the information and how the information is communicated that principally influences their acceptance or rejection of a procedure, rather than the nature of the intervention itself.

Raynes-Greenow et al's (2004) survey of pregnant women's preferences and knowledge of term breech management supports Leung et al's (2000) findings in which the main reason for unwillingness to attempt ECV among women was concern about the baby's safety during the procedure. After reading information about the risks and benefits of ECV provided as part of the study, equal proportions of women (39%) responded 'yes' and 'no' when asked if their baby was breech would they choose ECV, the remainder (22%) were uncertain. Reasons given by the women who hypothetically said no to ECV were 'it was not safe enough for the baby', 'vaginal delivery was not guaranteed even if ECV was successful', 'preference for CS', 'ECV was not effective enough' and 'unsure' (Raynes-Greenow et al, 2004). However, among the women who had heard of ECV prior to the study, this information was largely from sources other than their maternity care provider, which again raises questions about the quality of information that women receive.

Reducing the incidence of breech presentation

The significant increase in CS rates following the publication of the TBT indicates that measures to reduce the incidence of breech presentation have become more important. ECV should be performed where ultrasound, cardiotocography and theatre facilities are available. ECV is one of the few obstetric interventions for which there is evidence that its use reduces CS rates (Hutton and Hofmeyer, 2006). However, although rare, there can be some risks associated with this procedure, such as:

- Premature rupture of membranes
- Fetal tachycardia or bradycardia
- Placental abruption
- Premature labour.

There is evidence that these risks often influence women in their decision as to whether or not to attempt an ECV, even though their chances of having a CS are reduced (Leung et al, 2000; Raynes-Greenow et al, 2004). ECV is usually offered at 36 to 38 weeks to turn breech babies and approximately 50% of ECV attempts are successful when the practitioner is experienced in the procedure. Its overall success rate has been reported between 30% and 80% (RCOG, 2006a). Race, parity, uterine tone, liquor volume, engagement of the breech and whether the head is palpable and the use of tocolytic drugs can all affect the success rate (Hutton and Hofmeyer, 2006). Sometimes after a successful version, a baby might revert back into a breech presentation. When this occurs ECV may be offered again, but some women find the procedure painful and will decline.

It has been reported that women experience varying levels of pain ranging from no pain to high levels of pain during the ECV procedure. Approximately 5% of women report high levels of pain and this appears to be associated with attempts that have failed (Impey and Pandit, 2005; Karantanis et al, 2001). Evidence, however, of providing adequate pain relief for women during the ECV procedure seems to be limited and this needs to be addressed (RCOG, 2006b). Increasing the uptake of ECV is recommended by the RCOG. Local policies should be implemented and an ECV service provided by skilled practitioners should be available to all

women with a breech presentation as there is significant evidence that this procedure can reduce the woman's risk of having a CS.

Moxibustion therapy

Moxibustion, widely regarded as an alternative or complementary therapy, is part of traditional Chinese medical practice. It is the burning of moxa made from the herb mugwort also known as *artemis vulgaris* in Latin. From its dried leaves, later compacted and rolled like a cigar, it is then lit and burned at a specific acupuncture point Bladder 67, located at the outer corner of the little toe of each foot. It is known for its deep heat properties that alter the flow of energy to the uterus and fetus encouraging the baby to turn. This therapy appears to be generally well tolerated, safe, non-invasive, painless and gives women another option prior to ECV (Ewies and Olah, 2002; Budd, 2000). In addition, one advantage of this therapy is that the woman's partner or a relative can be easily taught how to administer the treatment and this may have cost-effective implications. Moxibustion therapy has been used in China for centuries as a means of turning a breech baby and it has been reported that it is still routinely practised on women with a breech presentation from 33 to 37 weeks' gestation, with a claimed success rate of 85% to 90% (Cardini and Weixan, 1998).

An RCT involving 130 primigravida women in their 33rd week of pregnancy with a confirmed breech presentation by ultrasound scan received moxibustion therapy for seven days – 130 women received routine care but no intervention (Cardini and Weixan, 1998). The experimental group also received a further seven days moxibustion therapy if the baby was still in the breech presentation. Women with persistent breech in both groups could undergo ECV between 35 weeks to birth. One women in the experimental group and 24 in the control group received ECV. It was reported that 98 (75.4%) babies in the experimental group were in cephalic presentation at birth compared to 81 (62.3%) in the control group and this was statistically significant (p=0.02). However, this trial has been criticised due to lack of blinding and placebo effect (Ewies and Olah, 2002), although in practice, it is difficult to conceal such an intervention.

A more recent RCT investigated the combination of acupuncture plus moxibustion (Neri et al, 2004). This trial reported that 112 women with a confirmed breech presentation received this combined intervention at 33 to 35 weeks' gestation and were compared with 114 women who did not. At birth, cephalic presention was lower in the control group 42 (36.7%) when compared to the experimental group 60 (53.6%), this was statistically significant (p=0.01). However, this is only one RCT and the clinical significance is uncertain and further trials to confirm or refute this evidence is necessary.

A Cochrane review by Coyle et al (2005) examined the research evidence investigating the effectiveness and safety of moxibustion on turning the baby from a breech presentation, the need for ECV, mode of birth and perinatal morbidity and mortality. Three trials were included in this review with a total of 597 women. The reviewers were unable to undertake a meta-analysis of the data from the trials due to inconsistencies and differences within the trial methodologies and interventions. However, they reported that moxibustion reduced the need for ECV (relative risk (RR) 0.47, 95% confidence interval (CI) 0.33 to 0.66) and decreased the use of oxytocin before or during labour for women who had vaginal births (RR 0.28, 95% CI 0.13 to 0.60). They concluded that moxibustion may be helpful in turning a baby presenting by the breech when applied to the little toe, but there was insufficient evidence to support its use in clinical practice and recommended further research and well-designed RCTs to investigate the use of moxibustion.

Nevertheless, some NHS Trusts, where midwives and obstetricians are also qualified and experienced acupuncturists, provide an acupuncture service where moxibustion therapy is an option for women to consider prior to being offered ECV. Sarah Budd was one of the first midwives to establish an acupuncture clinic in a maternity unit in the UK and reported success with the use of moxibustion for cephalic version in breech presentation (Budd, 2000). A clinical audit undertaken by Calderdale and Huddersfield NHS Trust (2005) found an increase in CS for breech presentation when moxibustion therapy was discontinued prior to ECV being offered and, on the basis of this evidence, re-introduced this service for women. This NHS Trust is now planning to undertake an RCT to further investigate the effectiveness of moxibustion.

Implications for clinical practice

Women need evidence-based information about all available methods for turning breech presentations, as well as information about the risks and benefits of vaginal and caesarean birth if they are to make informed choices. Moxibustion therapy is not universally available and this may be due to the inconclusive research evidence supporting its effectiveness. However, there appears to be significant evidence of ECV's clinical effectiveness and this procedure is recommended by the RCOG to make it more readily available in maternity units.

The TBT and a Cochrane's review (Hofmeyr and Hannah, 2003) have recommended planned CS for safer outcomes for the baby and mother when compared with vaginal breech birth, but there is an ongoing obstetrical debate regarding this evidence to support the most safe and effective mode of birth for breech presentation. Nevertheless, this evidence has had a tremendous impact on clinical practice and the majority of women will be offered an elective CS. There is evidence that ECV is successful in 50% of cases when the practitioner is experienced in the procedure and its overall success rate is between 30% to 80% (RCOG, 2006b). However, ECV uptake remains low and the quality of the information women receive can influence their acceptance or rejection of this procedure, rather than the nature of the intervention itself. There is evidence that by giving women a detailed explanation of the ECV procedure and including information on the probability of success and the potential risks, many will then choose to have an ECV rather than proceed directly to elective CS if their baby is in the breech presentation. It is,

therefore, imperative that women receive a full explanation to assist them in their decision-making. Moxibustion therapy may be another option that women may want to consider as a Cochrane's review (Coyles et al, 2005) has reported that it can reduce the need for ECV and be helpful in turning a baby presenting by the breech. However, this option is provided by a limited number of maternity units.

Conclusion

There is evidence that the majority of women would prefer a vaginal birth and with increasing rates in CS for breech presentations, it is important to offer women real choices that are evidence based.

There appears to be a lack of recognition that some women will need pain relief for ECV and this aspect needs to be addressed. Some women will decline the procedure due to concerns over their baby's safety and the knowledge that a vaginal birth is not guaranteed.

We have different levels of evidence about the effectiveness of different interventions to turn a breech baby to a cephalic presentation. We know there is a need for further research to provide high-quality evidence related to risk assessment, birth outcomes and the impact of evidence on women's decision-making processes. The dilemma for researchers is finding a suitable sample to undertake the necessary research. Hopefully, these papers have provided substantive information on the current evidence base and will generate debate and trigger further research in this area.

References

Alarab M, Regan C, O'Connell MP, Keane DP, O'Herlihy C, Foley ME. (2004) Singleton vaginal breech delivery at term: still a safe option. *Obstetrics and Gynecology* **103(3)**: 407-12.

Albrechtsen S, Rasmussen S, Dalaker K, Irgens L. (1998) The occurrence of breech presentation in Norway: 1967 to 1994. *Acta Obstet Gynaecol Scand* **77**: 410-5.

Broche DE, Rietmuller D, Vidal C, Sautiere JL, Schaal JP, Maillet R. (2005) Obstetric and perinatal outcomes of a disreputable presentation the nonfrank breech. *Journal of Gynecology, Obstetrics, Biology and Reproduction* **34**: 781-8.

Budd S. (2000) Moxibustion for breech presentation. *Complementary therapies in nursing and midwifery* **6(4)**: 176-9.

Calderdale and Huddersfield NHS Trust. (2005) *Clinical audit of moxibustion therapy.* Calderdale and Huddersfield NHS Trust: Calderdale, West Yorkshire.

Cardini F, Weixan H. (1998) Moxibustion for correction of breech presentation: a randomised controlled trial. *JAMA* **280**: 1580-4.

Coyle ME, Smith CA, Peat B. (2005) Cephalic version by moxibustion for breech presentation: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 2**: CD003928. John Wiley and Sons: Chichester.

Ewies A, Olah K. (2002) Moxibustion in breech version: a descriptive review. *Acupuncture in medicine* **20(1)**: 26-9.

Gamble JA, Creedy DK. (2000) Women's request for a cesarean section: a critique of the literature. *Birth* **27(4)**: 256-63.

Glezerman M. (2006) Five years to the term breech trial: the rise and fall of a randomized controlled trial. *American Journal of Obstetrics and Gynecology* **194(1)**: 20-5.

Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AR. (2000) Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. Term Breech Trial Collaborative Group. *The Lancet* **356(9239)**: 1375-83.

Hofmeyr GJ, Hannah ME. (2003) Planned caesarean section for term breech delivery: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 3:** CD0000166. John Wiley and Sons: Chichester.

Hogle KL, Kilburn L, Hewson S, Gafni A, Wall R, Hannah ME. (2003) Impact of the international term breech trial on clinical practice and concerns: a survey of centre collaborators. *J Obstet Gynaecol Can* **25(1):** 14-6.

Hutton EK, Hofmeyer GJ. (2006) External cephalic version for breech presentation before term: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 1:** CD000084. John Wiley and Sons: Chichester.

Impey I, Pandit M. (2005) Tocolysis for repeat external cephalic version after a failed version for breech presentaion at term: a randomised double-blind placebo-controlled trial. *British Journal of Obstetrics and Gynaecology* **112**: 627-31.

Karantanis E, Alcock D, Phelan IK, Homer CS, Davis GK. (2001) Introducing external cephalic version to clinical practice. *Aust NZ J of Obstetrics and Gynaeology* **41(4)**: 395-7.

Kingdon C, Baker L, Lavender T. (2006) Systematic review of nulliparous women's views of planned cesarean birth: the missing component in the debate about a term cephalic trial. *Birth* **33(3)**: 229-37.

Leung TY, Lau TK, Lo KW, Rogers MS. (2000) A survey of pregnant women's attitude towards breech delivery and external cephalic version. *Aust NZ J Obstet Gynaecol* **40(3)**: 253-9.

McCourt C, Weaver J, Statham H, Beake S, Gamble J, Creedy DK. (2007) Elective cesarean section and decision-making: a critical review of the literature. *Birth* **34(1)**: 65-79.

Neri I, Airola G, Contu G , Allais G, Facchinetti F, Benedetto C. (2004) Acupuncture plus moxibustion to resolve breech presentation: a randomized controlled trial. *Journal of Maternal Fetal and Neonatal Medicine* **15**: 247-52.

Phipps H, Roberts CL, Nassar N, Raynes-Greenow CH, Peat B, Hutton EK. (2003) The management of breech pregnancies in Australia and New Zealand. *Aust NZ J Obstet Gynaecol* **43(4)**: 294-7.

Raynes-Greenow CH, Roberts CL, Barratt A, Brodrick B, Peat B. (2004) Pregnant women's preferences and knowledge of term breech management, in an Australian setting. *Midwifery* **20(2)**: 181-7.

RCOG. (2006a) *The management of breech presentation. RCOG greentop guideline*: 20b. RCOG: London.

RCOG. (2006b) *External cephalic version and reducing the incidence of breech presentation. RCOG greentop guideline*: 20a. RCOG: London.

Reilberg CCT, Elferink-Stinkens PM, Visser GHA. (2005) The effect of the Term Breech Trial on medical intervention behaviour and neonatal outcome in the Netherland: an analysis of 35,453 term breech infants. *British Journal of Obstetrics and Gynaecology* **112:** 205-9.

Roberts CL, Cameron CA, Nassar N, Raynes-Green CH. (2004) A simple patient-initiated intervention to increase antenatal detection of breech presentation at term. *Paediatr Perinat Epidemiol* **18**: 371-6.

Steen M, Kingdon C. (2008) Vaginal or caesarean delivery? How research has turned breech birth around. *Evidence Based Midwifery* **6(3)**: 95-9.

Turner MJ. (2006) The Term Breech Trial: are the clinical guidelines justified by the evidence? *J Obstet Gynaecol* **26(6)**: 491-4.

Hatamleh R, Sinclair M, Kernohan WG, Bunting B. (2008) Technological childbirth in northern Jordan: descriptive findings from a prospective cohort study. *Evidence Based Midwifery* **6(4):** 130-135

Technological childbirth in northern Jordan: descriptive findings from a prospective cohort study

Reem Hatamleh [1] *PhD, MSc, BSc.* ***Marlene Sinclair*** [2] *PhD, MEd, DASE, BSc, RNT, RM, RN.* ***W George Kernohan*** [3] *PhD, CPhys, CMath, FIMA, BSc.* ***Brendan Bunting*** [4] *CPsychol AFBPsS, PhD, BSc.*

1 Associate professor in midwifery, Jordan University of Science and Technology, Irbid 22110 Jordan. Email: reem1969@yahoo.com
2 Professor of midwifery research, Institute of Nursing Research, University of Ulster at Jordanstown, Newtownabbey BT37 0QB Northern Ireland. Email: m.sinclair1@ulster.ac.uk
3 Professor of health research, Institute of Nursing Research, University of Ulster at Jordanstown, Newtownabbey BT37 0QB Northern Ireland. Email: wg.kernohan@ulster.ac.uk
4 Professor of psychology, University of Ulster, Magee Campus, Londonderry BT48 7JL Northern Ireland. Email: bp.bunting@ulster.ac.uk

This study was funded by the Vice-Chancellor's Research Studentship (VCRS) at the University of Ulster.

Abstract

Background. In 1985, the World Health Organization (WHO) stated that no country should have an induction rate higher than 10%. Inappropriate use of induction technology in childbirth is leading to higher rates of induction, more instrumental birth and lower rates of vaginal birth. Many countries do not routinely collect data on induction and this study was undertaken in Jordan in 2004, where this type of data were not collected.

Aim. This paper provides a description of one small aspect of a large doctoral study and presents the first baseline data on birth outcomes for a prospective, self-selected cohort of 200 primiparous women, who gave birth in one major maternity hospital in Northern Jordan.

Method. An exploratory, descriptive approach was necessary to collect data from a prospective cohort of women booking for their first pregnancy at one large maternity unit. A convenience sample was selected and all women who booked for their first pregnancy in one major unit during the 12-week period allocated to recruitment were eligible to participate (n=530). Data were analysed using SPSS version 11 and will be presented in this paper descriptively. Ethical approval was granted from the Human Subject Committee at Jordan University of Science and Technology.

Findings. Although 530 primiparous women booked during the study period, a full data set of three entries for each participant was available for only 200 women. Of these, the majority (n=161, 81%) underwent induction of labour. Half (n=100) of the babies were admitted to the neonatal intensive care unit for resuscitation after birth and 19 were re-admitted to hospital within the first four weeks, mainly due to respiratory problems. A total of 25 mothers (13%) were re-admitted to hospital within four weeks of birth with urinary tract infection, anaemia, mastitis and wound infection. This research was limited due to the lack of randomisation, geographical clustering and the need for multi-centre involvement. However, it demonstrates sufficient evidence to support the recommendation for the development of a national data set on maternal and infant morbidity and mortality (including induction rates), as well as the development of a national policy for the promotion of 'normal' birth. Further international research in this area is required in order to pool data.

Key words: Induction, maternal morbidity, Middle East, birth technology, prospective study

Background

The Central Intelligence Agency (CIA) world factbook website estimated the following health statistics for the year 2006 for Jordan. In a population of nearly six million people with a median age of 23 years, the crude birth rate is estimated at 21.25 per 1000 population, the fertility rate at 2.63 children born per woman (CIA, 2006). The World Health Organization (WHO) reported a maternal mortality ratio of 41 per 100,000 live births, a perinatal mortality of 22 per 1000 total births, a neonatal mortality of 16 per 1000 live births and an infant mortality of 28 per 1000 live births. In total, 99% of all women received antenatal care and 99.5% were attended by a healthcare professional during labour and delivery, 97% gave birth in hospital, but the caesarean section (CS) rate was 16% in 2004 (World Health Organization, 2004). It is estimated that the majority of infant deaths occur in the neonatal period, with the major causes and proportional mortality being respiratory distress syndrome (40%), sepsis (14%), and asphyxia (12%) (World Health Organization, 2004).

Jordan is essentially an urban society with about 75% of its population living in towns and therefore close to healthcare facilities. These figures identify Jordan as one of the most privileged countries in the Middle East in terms of maternal and child health. However, it is worth noting that data on maternal and infant morbidity are not generally available, and that the induction rate is increasing and the CS rate has increased from 10.7% in 1997 to 16% in 2004 (WHO, 2004, 2006). The rate of caesarean birth in 2004 in two major hospitals in northern Jordan – King Abdullah University Hospital and Bade'a Hospital – was 36.6% and 20% respectively (King Abdullah University Hospital, 2004; Bade'a Hospital, 2004).

The rise in the use of technology and childbirth has been a concern for some time. In 1985, the WHO convened a joint interregional conference in Fortaleza, Brazil, in response to the increased use of routine birth technology. The conference issued a report including 21 recommendations about the use of technology in childbirth. One of these recommendations made it clear that 'birth should not be induced for convenience, and induction should not take place unless there was

a medical indication'. Recommendations for a 10% induction rate were also proposed (WHO Regional Office for Europe, 1985). A subsequent publication on guidelines for good care in labour recommended a de-medicalisation of childbirth and, in particular, that electronic fetal monitoring (EFM) should only be used in the presence of medical indications (WHO, 1996). However, despite these recommendations there is evidence that intervention rates and the use of routine birth technology have continued to increase.

A structured literature search was conducted to identify the evidence concerning the use of technology in pregnancy, but more specifically for induction of labour and its consequences in general, and more specifically in Jordan. The following databases were explored: Ovid (1966-present), MEDLINE (1966-present), Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982-present), Allied and Complimentary Medicine Index (AMED) (1985-present), British Nursing Index (BNI) (1985-present), and the Cochrane Database of Systematic Reviews. The computer-based search was supplemented by a manual search of the references listed. The key words used for the search strategy were 'induction of labour' and/or 'induced labour'. These were combined to 'amniotomy', 'oxytocin', 'sweeping of membranes', 'prostaglandins', 'survey', 'post-term pregnancy', 'indication', 'morbidity', 'mortality' and subsequently combined with 'northern Jordan', 'Jordan' and 'Middle East'. The selected languages for the literature review were English and/or Arabic.

The search revealed no paper dealing specifically with the Jordanian obstetric situation. Therefore, a more general search was undertaken to provide an overview of induction from available literature. A synopsis is presented here.

The appropriate use of birth technology in childbirth continues to be debated worldwide (Wagner, 1994; Sinclair and Gardner, 2001). The use of obstetrical interventions has sometimes led to a complex chain of reactions that are closely related to each other and that are conducted by midwives or obstetricians for women during the antenatal, intranatal and postnatal periods. Birth technology may have been initially aimed at decreasing maternal and fetal mortality and morbidity, but there is evidence that it strongly influences obstetrical and midwifery practice (Sinclair, 1999; Sinclair and Crozier, 2004), and includes strict antenatal monitoring, active management of labour, an increased use of induction of labour, continuous electronic fetal monitoring, epidural analgesia, episiotomy, lithotomy position, instrumental deliveries and CS.

According to the National Institute for Health and Clinical Excellence (NICE), induction of labour in the UK is defined as 'an intervention designed to artificially initiate uterine contractions leading to progressive dilatation and effacement of the cervix and birth of the baby. This includes both women with intact membranes and women with spontaneous rupture of the membranes, but who are not in labour. As with any other intervention, induction of labour may have unwanted side-effects. Induction of labour is indicated when it is agreed that the fetus or mother will benefit from a higher probability of a healthy outcome than if birth is delayed. The process of induction of labour should only be considered when vaginal delivery is felt to be the appropriate route of delivery. Induction of labour is a common procedure, about 20% of pregnant women will have labour induced for a variety of reasons. Induction does not usually involve just a single intervention, but is a complex set of interventions and as such presents challenges for both clinicians and mothers' (NICE, 2001a).

Labour can only be said to be induced after the legal viability age, for example, after 24 completed weeks of gestation in the UK (NICE, 2001a, 2001b). Prior to that gestational age, even if the clinical approach might be similar, the convention is to use the term 'termination of pregnancy'. Induction of labour can be indicated where the maternal or fetal health is judged to be compromised, for example, medical illness pre-dating the pregnancy, or pregnancy complications such as pre-eclampsia and intrauterine growth retardation.

It is clear from the NICE guidelines and from others (Wagner, 1994; Sinclair, 1999) that an induction should only be used for the benefit of either mother or fetus, to reduce perinatal mortality and morbidity, but there is evidence of labour being induced for convenience (Boulvain et al, 2001; Sinclair and Crozier, 2004). Less obvious factors have also led to an increase in induction rates, for example, the decrease in the autonomous role of midwives, and the increase in the concentration of births in hospitals (Oakley, 1984). Anecdotal information indicates that reasons for the increasing rate include the hospitalisation of birth, replacing low technology with sophisticated technology, and the domination of the medical model in maternal care. In developed countries, it has been linked to the current litigious society.

One of the main areas of concern regarding the potential risks of inducing labour is that of post-term pregnancies. A wide variety of policies have been adopted with routine induction at 40, 41, or 42 completed weeks' gestation, with or without evidence of maternal and/or fetal abnormalities identified during careful antenatal surveillance (Enkin et al, 2000).

The general literature identified a number of possible risk factors for mothers and babies from induction, such as an increase in the incidence of both instrumental deliveries and CS, more perineal trauma, greater requirement for analgesia, neonatal admission to special care, lower Apgar score (Duff and Sinclair, 2000; Bailit et al, 2002), and increased chance of haemorrhage, low gestation age, low birthweight (Enkin et al, 2000). Induction by using amniotomy is associated with increase rate of CS for fetal distress and lower Apgar score (Fraser et al, 2000). Induction by using sweeping of membranes has been associated with bleeding, irregular contractions and discomfort during vaginal examination (Boulvain et al, 2005). UK scientific investigators have noted that the use of oxytocin to induce labour increases the incidence of jaundice in the newborn, and it is associated with increased use of pain relief and continuous fetal heart monitoring (Tan and Hannah, 2000a) and unsuccessful vaginal delivery within 24 hours (Kelly and Tan, 2001). Continuous EFM is associated with increased risk of operative delivery and CS for fetal distress (Thacker and Stroup, 1999). The challenge to EFM is that its introduction has correlated with

an increasing rate of operative delivery without the anticipated correlation of a reduction in the incidence of cerebral palsy and disability (Haggerty, 1999). It has been argued that EFM technology per se is not the problem, it lies with health professionals who require expert knowledge and skills necessary to interpret the data presented to them from the visual display unit (Sinclair, 2001b, 2001c).

Identifying potential complications in the unnecessary use of interventions, such as induction of labour or EFM has led to the recommendations by NICE and WHO that such interventions should only be used in the presence of specific maternal and/or fetal risks (WHO, 1996; NICE, 2001b). The literature search was supplemented by contacting the Jordanian government to request statistical data on induction of labour and national guidelines. None was available. However, statistics from King Abdullah University Hospital and Bade'a Hospital for CS birth for 2003 to 2004 were provided and were 37% and 20% respectively, but induction rates were not provided. (King Abdullah University Hospital, 2004; Bade'a Hospital, 2004). Therefore, this study provides an important first data set for northern Jordan. With rising rates of induction ranging from 10% to 30% (Dosa, 2001), and the steady increases in operative vaginal delivery and CS in Europe and many other parts of the world (Chamberlain and Zander, 1999), it is important to examine maternal and perinatal outcomes carefully.

Method

A prospective cohort study was designed to collect data on birth technology usage and data on induction in particular, using a convenience and purposive sample of 200 nulliparous women who gave birth in 2004. A retrospective design was considered, because it would enable the analysis of a larger dataset, but this approach had to be rejected, because the quality of the medical records was such that it was impossible to decipher them and create a reliable database. A prospective design provided the researcher with an opportunity to follow women through pregnancy into the puerperium and to gather data on morbidity six weeks after birth.

The study took place in a maternity hospital in the northern part of Jordan located in Irbid and under the authority of the Ministry of Health. Irbid is the second largest city in Jordan. With about 9000 deliveries a year (Abu-Ekteish et al, 1997), the hospital provides maternity services to the majority of women in the area and acts as a tertiary centre with an occupancy rate of 82% (Department of Statistics, 2002).

A convenience, purposive sample of women who were primiparous aged 18 years and above was selected. Convenience samples are probably the most frequently used of all types of sample in both types of research (Parahoo, 1997).

The project was advertised on posters placed in the antenatal and postnatal clinic as well as the local health centres. The posters displayed details of the study including title, process, aims, benefits, and inclusion criteria.

Instrument and measures

A specially-designed questionnaire was developed to collect data about maternal and infant outcomes during the intrapartum and postnatal period. Data extraction were confirmed by cross-referencing data held in the case notes. The construction of the questionnaire took into consideration the culture, language and the educational level of women targeted for the study. Translation from English to Arabic and back translation from Arabic to English was carried out because the majority of women spoke Arabic only.

Validity and reliability

The instrument was constructed after an extensive review of the literature and was subjected to significant pre-testing by conducting three pilot studies to enhance the validity and reliability. Content validity was assessed by two methods. The first one was an organised review of the questionnaire's content by the researcher and the researcher's supervisors to ensure that the instrument met the research objectives. The second method was submitting the questionnaire to a panel of experts who could make suggestions on the adequacy and relevance of the questions.

Data analysis

A total of 200 women completed the full research study and all data were analysed using the SPSS version 11.0 statistical package (SPSS Inc, Chicago, US). Data were subjected to descriptive analysis including frequency, mean, median, standard deviation and cross-tabulation.

Ethical approval

Approval to conduct the study was given by the Human Subject's Committee at the Jordan University of Science and Technology. In order to obtain access to all governmental hospitals, a letter was sent to the Ministry of Health and permission was granted to collect the data.

Findings

A total of 200 women completed the data entries at all three points in time, antenatally, just after birth and within six weeks postnatally. Of these, 161 had induced labour and 39 had spontaneous labour or planned CS.

Demographic profile of participants

All of the women were married and aged between 19 and 38 years. The majority (128/200 – 64%) had attended school for at least 12 years, less than half (71/120 – 35.5%) had a university education; one woman had no formal education and was illiterate. The majority were housewives (145/200 – 72.5%), with just under a third (55/200 – 27.5%) working outside the home. Most women (180/200 – 90%) had a family income of less than £360 per month. A small number smoked cigarettes (23/200 – 11.5%) at the onset of pregnancy, but nine of these women stopped smoking during pregnancy.

The gestational age at delivery ranged between 30 and 42 weeks and the majority of women delivered at term, but 28/200 (14%) gave birth before 37 completed weeks of gestation. This group included four twin pregnancies, so

the total number of babies born to these 200 women was 204. Five infants died at birth, all of them were twins, three of them were the first twin and two were the second twin. The cause of death was respiratory distress syndrome as a result of prematurity. Birthweights ranged from 1.5kg to 4.5kg with a mean of 3.1kg (SD=0.55).

Use of technology during pregnancy and childbirth

The majority of births were supported, managed and controlled by the use of technology. In the antenatal period, the number of ultrasound scans ranged from one to 27 (mean 9.7, SD=5.4) and the majority of women expected to be scanned at every visit. Qualitative data demonstrated that women perceived the quality of their care to be better if they had more scans and more EFM in the antenatal and intranatal setting. Women reported a need to 'see' how well their baby was growing.

Induction was the 'norm' with 161/200 (80.5%) being induced. The majority of inductions did not appear to have any clear indication and the data were checked by accessing case notes in addition to women's self-reporting. The majority of women (65%, n=129) had their labour induced at a gestational age of between 38 and 39 weeks, with only 12 women (6%) experiencing spontaneous labour. Those who had spontaneous labour went into labour at home and presented themselves to hospital staff in early labour.

A range of technological interventions was recorded: 144 (72%) women had an artificial rupture of membranes, 145 (72.5%) had their labour augmented with oxytocin, 178 (89%) had continuous EFM and 132 (66%) had an episiotomy.

Birth outcomes

The majority of the women (128/200 – 64%) had a vaginal birth, four (2%) had an instrumental delivery, 27 (14%) had a planned CS, and 41 (21%) had an emergency CS. The overwhelming majority of women who had a vaginal delivery – spontaneous or instrumental (125/132 – 95%) stated they suffered perineal trauma.

Apgar scores at one minute ranged from two to eight, with a mean of 6.9 (SD=1.2), and at five minutes, ranged from five to nine with a mean of 8.3 (SD=1). A total of 74 babies (37%) of the sample had a low Apgar score (less than 7) at the first minute, and 10.5% (n=21) had a low Apgar score at the fifth minute. None of the women had umbilical cord prolapse or ruptured uterus. Half of the babies (n=100, 50%) were admitted to the neonatal care unit for resuscitation; their length of stay in the neonatal unit ranged from one hour to 18 days.

Self-reported problems postpartum and at six weeks

Many women reported feeling pain at the episiotomy site on the tenth day (n=83, 42%), painful intercourse at six weeks (n=81, 41%), high temperature with shivering (n=54, 27%), infection at the episiotomy site (n=28, 14%), mastitis (n=24, 12%), urinary incontinence (n=19, 9.5%) and faecal incontinence (n=4, 2.5%).

Hospital readmission

A total of 19 babies and 25 mothers were admitted to hospital in the early weeks after birth. Urinary tract infection, anaemia, mastitis and wound infection were the major reasons for mothers' readmission to hospital, with respiratory and gastrointestinal problems for infants.

Discussion

The results indicate that technology is widely used to support, monitor and manage birth in northern Jordan. For example, the number of ultrasound scans in this study ranged from one to 27 throughout pregnancy. These reflect the routine use of ultrasound scans for all pregnant women in Jordan. These findings contradict the WHO recommendation of a single ultrasound scan during a normal pregnancy (WHO, 1996). Enkin et al (2000) mentioned that the value of selective ultrasound scans for specific indications in pregnancy has been clearly established. Induction is a valuable intervention in cases where mother and/or infants are at risk. However, the majority of women (n=129, 65%) had their labour induced without a clear indication. These findings demonstrate that there is an inappropriate use of induction technology in northern Jordan. The high rate of induction without clear indication leads one to conclude that induction of labour was carried out for convenience. These findings are contrary to the recommendation that labour should not be induced for convenience, and that induction of labour should be reserved for specific indications (WHO, 1996; NICE, 2001a).

The rate of induction in this study appears to exceed the WHO (2001) recommendation eight-fold, although it should be viewed cautiously as the results are based on a convenience, self-selected sample subject to bias. According to the WHO recommendation, 'no geographic region should have rates of induced labour over 10%'. These findings are higher than the rates reported in other studies (Heffner et al, 2003; Hoffman et al, 2006). It is worthy of mention that childbirth care in Jordan is based on the medical model, and that obstetricians are the care-providers during pregnancy and childbirth for the vast majority of women. In this study, the common method of induction was artificial rupture of membranes followed by artificial oxytocin (129/200 – 64.5%). Three women were recorded as being induced by amniotomy alone and the remainder appear to have been induced by amniotomy plus oxytocin, but it is not possible to accurately determine cervical dilatation at the time of the amniotomy. Amniotomy plus oxytocin has been established as being an effective method for induction of labour (Enkin et al, 2000). Although the method of induction used for these women was evidence based, the timing of the intervention was not, as the majority of women were induced at 38 to 39 weeks' gestation. The evidence available from the literature highlights that there is no benefit of elective induction before 41 completed gestation weeks (Hannah, 1996).

Further breakdown of data showed that the induced group accounted for the highest proportion of emergency CS (n=37, 18.5%) and for all instrumental vaginal deliveries (n=4, 2%). It also showed that the induced group

accounted for the higher proportion of emergency CS due to fetal distress (n=19, 11.8%) and for all emergency CS due to failed induction. The rate of CS in the induced group in this study was 18.5% compared to 2% in the spontaneous group. These findings are in keeping with other studies that found that CS increased significantly with induction of labour compared with those who had a spontaneous labour (Hoffman et al, 2006). The rate of CS in this study lies within the range reported by others who found in nulliparae who had induced labour a range of between 13.7% and 24.7% (Heffner et al, 2003).

The induction group accounted for all the instrumental deliveries. These findings are in keeping with those of Dublin et al (2000) and Alexander et al (2000). This study was limited to primipara women and it is known that primipara have the highest background rate for CS (Seyb et al, 1999).

The reasons given for CS were examined. It was noted that, in addition to 15 mothers being delivered by CS following failed induction, only 15 (9%) of all the inductions were for post-term pregnancy. There were significantly higher incidences in the induced group of CS for fetal distress (12%), arrest (0.6%), and failed vacuum extraction (0.6%). Fetal distress and failed induction were the major reasons for emergency CS (12% and 9% respectively) in the induced group. Further breakdown of the data showed that the induced group accounted for a high proportion of the different signs of fetal distress (88%, n=142/161). Findings showed that all women who were induced after 40 weeks ended up undergoing emergency CS. These findings are in keeping with those from a large retrospective observational cohort study, which included nullipara women, carried out by Yeast et al (1999) who found that the CS rate for post-date inductions was high (16.2%). The indications for CS in the induced group in this study are similar to the indications reported by Heffner et al (2003), who found that induction increased the frequency of CS for non-reassuring fetal status, failed induction, and non-reassuring fetal status plus failure to progress. Induction of labour is also associated with a requirement for pain relief and continuous EFM (Tan and Hannah, 2000b). There were 152/161 in the induced group who were monitored by continuous EFM, out of which 20 underwent emergency CS due to fetal distress, and four women required instrumental support. These findings are in keeping with those of Enkin et al (2000) and Thacker and Stroup (1999), who concluded that continuous EFM is associated with increased risk of operative delivery and CS for fetal distress.

All women who had vaginal delivery in this study had an episiotomy as a routine policy. These findings are in keeping with those of Goldberg et al (2002), who found an increased association between episiotomy and forceps delivery, and with third or fourth degree laceration. Thus, the high proportion of women who had different types of perineal trauma with episiotomy is not surprising. There is an urgent need to change practice from routine episiotomy to selective episiotomy. This can be achieved through developing network policies and educating midwives and doctors about the care of the perineum during delivery.

Results showed that 74 (37%) of babies in the sample had low Apgar scores (less than five at one minute) and 21 (10.5%) had low Apgar scores (less than seven at five minutes). These findings support the work carried out by Duff and Sinclair (2000), who found that infants born to mothers who were induced had significantly lower Apgar scores at one minute and five minutes when compared to babies born to women who were not induced.

Almost half of the babies were admitted to the neonatal intensive care unit (NICU) for resuscitation (50%, n=100), and the length of stay ranged from one to 432 hours with a mean of 21 hours (SD=62.56). Further breakdown of data showed that almost all babies who had lower Apgar scores at one minute (91%, n=67/74) and five minutes needed resuscitation and admission to the NICU. These findings support the work done by Boulvain et al (2001), who reported a trend towards a greater requirement for neonatal resuscitation and admission to the NICU in the induced group. However, these results and those of Boulvain et al (2001) stand in opposition to earlier work of Seyb et al (1999), who reported that the incidence of meconuim, lower Apgar score at one and five minutes, and NICU admission were not significantly different between groups of infants who were induced and those who were not.

The impact of induction of labour on maternal and infant outcomes in this study symbolises a technological chain of events similar to that described by Sinclair (1999) and Sinclair and Crozier (2004). Once the natural cycle of normal spontaneous birth has been broken and technology is introduced, one intervention leads to another. Intervention technologies, such as amniotomy and syntocinon require monitoring technologies such as EFM and dinomapp, in order to safeguard mother and baby from iatrogenic harm. However, with appropriate use of technology and multiprofessional teamwork, the induction rate and associated morbidities can be signifigantly reduced through the use of NICE guidelines, evidence-based practice and effective multidisciplinary teamworking (Sinclair et al, 2007).

Conclusion

In Jordan, there is no clear policy for 'normal' pregnancy and childbirth, therefore induction of labour is not monitored or policy led. This bird's eye view of technology in one clinical setting portrays a grim picture of the outcomes of uncensored and routine use of induction technology in northern Jordan.

Limitations

This research has been limited due to the lack of randomisation, geographical clustering, the need for multi-centre involvement, and sampling difficulties. Further international research in this area is required in order to pool data. However, the study does provide new data that is sufficient to support a recommendation for the development of a national data-set on maternal and infant morbidity and mortality (including induction rates), as well as the development of a national policy for the promotion of normality and the appropriate use of induction technology.

References

Abu-Ekteish F, Daud A, Sunna E, Obeidat A, Al-Rimawi HS. (1997) Perinatal mortality at Princess Badia' Teaching Hospital, northern Jordan. *Annals of Saudi Medicine* **17(1)**: 120-3.

Alexander J, MCIntire D, Leveno JK. (2000) Forty weeks and beyond: pregnancy outcomes by week of gestation. *Obstetric and Gynaecology* **96(2):** 291-4.

Bade'a Hospital. (2004) *Type and number of deliveries. Annual Report*. Bade'a Hospital Statistics Office: Irbid.

Bailit JL, Downs SM, Thorp JM. (2002) Reducing the caesarean delivery risk in elective inductions of labour: a decision analysis. *Paediatr Perinat Epidemiol* **16(1):** 90-6.

Boulvain M, Marcoux S, Bureau M, Fortier M, Fraser W. (2001) Risks of induction of labour in uncomplicated term pregnancies. *Paediatric and Prenatal Epidemiology* **15**: 131-9.

Boulvain M, Stan C, Irion O. (2005) Membrane sweeping for induction of labour. *Birth* **32(2)**: 152.

Chamberlain G, Zander L. (1999) ABC of labour care: induction. *BMJ* **318(7189)**: 995-8.

Central Intelligence Agency. (2006) *The world factbook – Jordan*. Central Intelligence Agency: Washington.

Department of Statistics. (2002) *Population and family health survey.* See: www.measuredhs.com/pubs/pub_details.cfm?ID=533&ctry_id=18&SrvyTp= (accessed 25 November 2008).

Dosa L. (2001) Caesarean section delivery, an increasingly popular option. *Bull World Health Organ* **79(12):** 1173.

Dublin S, Lydon-Rochelle M, Kaplan RC, Watts DH, Critchlow CW. (2000) Maternal and neonatal outcomes after induction of labor without an identified indication. *Am J Obstet Gynecol* **183(4):** 986-94.

Duff C, Sinclair M. (2000) Exploring the risks associated with induction of labour: a retrospective study using the NIMATS database. Northern Ireland maternity system. *Journal of Advanced Nursing* **31(2)**: 410-7.

Enkin M, Keirse M, Renfrew M, Neilson J, Crowther C, Duley L, Hofmeyr G. (2000) *A guide to effective care in pregnancy and childbirth*. Oxford University Press: Oxford.

Fraser WD, Turcot L, Krauss I, Brisson-Carrol G. (2000) Amniotomy for shortening spontaneous labour: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 2:** CD000015. John Wiley and Sons: Chichester.

Goldberg J, Holtz D, Hyslop T, Tolosa J. (2002) Has the use of routine episiotomy decreased? Examination of episiotomy rates from 1983 to 2000. *Obstetric and Gynaecology* **99(3):** 395-400.

Haggerty LA. (1999) Continuous electronic fetal monitoring: contradictions between practice and research. *J Obstet Gynecol Neonatal Nurs* **28(4):** 409-16.

Hannah WJ. (1996) Induction of labour: post-term pregnancy and term prelabour rupture of membranes – evidence for practice. *Journal of Society of Obstetricians and Gynaecologist of Canada* **18**: 85-9.

Heffner LJ, Elkin E, Fretts RC. (2003) Impact of labor induction, gestational age, and maternal age on cesarean delivery rates. *Obstet Gynecol* **102(2):** 287-93.

Hoffman MK, Vahratian A, Sciscione AC, Troendle JF, Zhang J. (2006). Comparison of labor progression between induced and noninduced multiparous women. *Obstet Gynecol* **107(5):** 1029-34.

King Abdullah University Hospital. (2004) T*ype and number of deliveries. Annual Report*. King Abdullah University Hospital Statistics Office: Irbid.

Kelly AJ, Tan B. (2001) Intravenous oxytocin alone for cervical ripening and induction of labour: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 3:** CD003246. John Wiley and Sons: Chichester.

National Institute for Health and Clinical Excellence. (2001a) *Induction of labour*. NICE: London.

National Institute for Health and Clinical Excellence. (2001b) *The use of electronic fetal monitoring*. NICE: London.

Oakley A. (1984) *The captured womb: a history of the medical care of pregnant women*. Blackwell: Oxford.

Parahoo K. (1997) *Nursing research: principles processes and issues*. Macmillan: Basingstoke.

Seyb S, Berka R, Socol M, Dooley S. (1999). Risk of cesarean delivery with elective induction of labor at term in nulliparous women. *Obstetrics and Gynecology* **94(4):** 600-7.

Sinclair M. (1999) *Midwives' readiness to use high technology in the labour ward. Implications for Education and Training*. Queen's University Belfast (unpublished PhD thesis).

Sinclair MK. (2001a) Midwifery managers' perspectives on midwives' use of birth technology. *All Ireland Journal of Nursing & Midwifery* **1(6):** 213-19.

Sinclair MK. (2001b) Birth technology: observations of high usage in the labour ward. *All Ireland Journal of Nursing & Midwifery* **1(3):** 83-8.

Sinclair MK. (2001c) Midwives' attitudes to the use of the cardiotocograph machine. *Journal of Advanced Nursing* **35(4)**: 559-606.

Sinclair MK, Gardner J. (2001) Midwives' perceptions of the use of technology in assisting childbirth in Northern Ireland. *Journal of Advanced Nursing* **36(2):** 229-36.

Sinclair M, Crozier K. (2004) Medical device raining in maternity care: part 2. *British Journal of Midwifery* **12(8):** 509-13.

Sinclair MK, Boreland, Z, McCabe, N. (2007) Less intervention. *RCM Midwives Journal* **10(4):** 214.

Tan BP, Hannah ME. (2000a) Oxytocin for prelabour rupture of membranes at or near term: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 2**: CD000157. John Wiley and Sons: Chichester.

Tan BP, Hannah M. (2000b) Prostaglandins for prelabour rupture of membranes at or near term: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 2**: CD000178. John Wiley and Sons: Chichester.

Thacker S, Stroup C. (1999). Continuous electronic heart rate monitoring versus intermitten auscultation for assessment during labor: In: Cochrane Database Syst Rev. *The Cochrane Library* **Issue 4.** Update Software: Oxford.

Wagner M. (1994) *Pursuing the birth machine – the search for appropriate birth technology.* ACE Graphics: Camperdown.

World Health Organization Regional Office for Europe. (1985) *Joint Interregional Conference on Appropriate Technology for Birth*. WHO: Fortaleza, Brazil.

World Health Organization. (1996) *Care in normal birth: a practical guide.* WHO: Geneva.

World Health Organization. (2004) *Making pregnancy safer statistics in EMR – part one*. WHO: Geneva.

World Health Organization. (2006) *Reproductive health indicators – guidelines for their generation, interpretation and analysis for global monitoring.* WHO: Geneva.

Yeast JD, Jones A, Poskin M. (1999) Induction of labour and the relationship to caesarean delivery: a review of 7001 consecutive inductions. *American Journal of Obstetrics and Gynecology* **180(3):** 628-33.

Cameron J, Taylor J, Greene A. (2008) Evaluating professional guidelines for the care of dying previable infants. *Evidence Based Midwifery* **6**(**4**): 136-142

Evaluating professional guidelines for the care of dying previable infants

Joan Cameron[1] *MSc, RGN, RM. Julie Taylor*[2] *PhD, MSc, BSc, RN. Alexandra Greene*[3] *PhD, MA, RN.*

1 Lead midwife and postgraduate student, University of Dundee, School of Nursing and Midwifery, 11 Airlie Place, Dundee DD1 4HJ Scotland. Email: j.cameron@dundee.ac.uk

2 Professor of family health, University of Dundee, School of Nursing and Midwifery, 11 Airlie Place, Dundee DD1 4HJ Scotland. Email: j.z.tayor@dundee.ac.uk

3 Senior research fellow, Health Services Research Unit, University of Aberdeen, Foresterhill, Aberdeen AB25 2ZD Scotland. Email: a.greene@abdn.ac.uk

The authors wish to thank Gillian Watson who acted as an appraiser and members of the postgraduate research forum who participated in the pilot review.

Abstract

Objective. To identify, describe and evaluate published professional guidelines for the care of dying previable babies.

Design. Systematic review and a search of databases including PubMed, MEDLINE and the Cochrane Library.

Setting and sources. Publicly available, English language guidelines for the care of dying previable babies identified through a systematic literature search.

Analysis. Applying the Appraisal of Guidelines for Research and Evaluation (AGREE) collaboration instrument to six guidlines for the treatment of previable babies.

Results.The analysis demonstrated that the process of guideline development was not carried out in line with best practice as recommended by the National Institute for Health and Clinical Excellence (2007). The lack of an evidence base for care was not indicated in the guidelines.

Conclusions. Current guidelines for the care of dying previable babies appear to be based on description and opinion, rather than evidence. Future guideline developments for this group of vulnerable babies and their families should follow a more transparent and systematic process to enable health professionals to deliver effective care.

Key words: Dying previable baby, guidelines, evaluation, AGREE evaluation tool, palliative care, evidence base

Introduction and background

The legal age of viability in the UK is currently 24 completed weeks' gestation (Nuffield Council on Bioethics, 2006). Approximately 60% of infants born alive before 24 completed weeks' gestation will die in the delivery room and a further 30% will die soon afterwards in the neonatal intensive care unit (Costeloe et al, 2000; Vanhaesebrouck et al, 2004). The survivors are likely to experience severe morbidity, including chronic lung disease, visual defects and cerebral palsy (Marlow, 2004). The RCOG ethics committee discussing the ethics of prolonging life in the newborn states: 'Concerns about suffering might lead to a positive argument for resuscitation limits …. as many babies … may be suffering from multiple, repetitive and invasive neonatal treatments' (RCOG, 2005: 3).

The UK has no definitive limits in relation to the initiation of resuscitation and treatment of very preterm infants. However, the principle of 'best interests' holds that any treatment or intervention that might produce suffering must have commensurate benefits for the infant (Nuffield Council on Bioethics, 2006). In relation to previable infants, the potential outcomes must be weighed against the pain and suffering caused by the necessary interventions. In many cases, the outcome for the infant will be death or severe impairment. In these instances, it is permissible for life-sustaining treatment, such as resuscitation, to be withheld. The Royal College of Paediatrics and Child Health (RCPCH) guidelines advise: 'Withdrawal of life-sustaining treatment in appropriate circumstances is not seen by the courts as active killing, nor as a breach of the right to life under Article 2 of the European Convention of Human Rights' (RCPCH, 2004: 21).

Where resuscitation and active treatment are withheld, the report of the Nuffield Council on Bioethics (2006) recommends that palliative care should be offered. The concept of palliative care includes meeting physical needs for warmth, relief of pain, hydration and nutrition, as well as providing support to meet the psychological, spiritual and social needs of the patient and the family (Saunders, 1996).

Palliative care is a relatively new concept in neonatal care. Research into neonatal palliative care so far has focused on describing the nature of the care delivered (Moro et al, 2006; Kain, 2006; Ramer-Chrasek, 2005), barriers to its provision (Kain, 2006) and tabulating the type of care given such as the involvement of parents, withholding or withdrawal of care or the provision of pain relief, rather than the effectiveness of care (Moro et al, 2006). Research into the provision of palliative care for neonates focuses on babies who have been admitted to neonatal intensive care units, rather than previable babies who are being cared for in labour wards (Ramer-Chrasek, 2005; Kain, 2006; Moro et al, 2006).

The needs of dying previable babies being cared for on labour wards are not explicitly addressed. Previable babies who die on labour wards will be cared for by midwives or neonatal nurses without specialist expertise in caring for sick neonates. They are unlikely to be monitored so assessment of physiological parameters to determine the need for palliative care interventions, such as pain relief or oxygen is difficult. Previable infants are also unlikely to have intravenous access established in the labour so the provision of pain relief and nutrition is difficult to accomplish.

Increasingly, guidelines have been seen as a means of providing health professionals with evidence-based health care for dealing with specific clinical situations (Woolf et al, 1999). Guidelines have been developed to inform the care of dying

Table 1. Total number of guidelines retrieved, showing those included and excluded from each source

Source	Total number papers retrieved	Papers identified as potentially eligible	Number excluded after scrutiny	Guidelines meeting all inclusion criteria and included in review
PubMed	25	4	3	1
MEDLINE	17	2	2	0
CINAHL	328	4	4	0
Science Direct	128	0	0	0
SCOPUS	0	0	0	0
MIDIRS	250	4	4	0
Professional organisations	16	15	11	4
National Library of Guidelines	3	1	1	0
National Guideline Clearinghouse	1	1	1	0
Scottish Intercollegiate Guidelines Network	0	0	0	0
NICE	0	0	0	0
Online discussion groups	1	1	0	1

previable babies. The purpose of this review, therefore, is to identify, explicate and evaluate published guidelines for care for the dying previable infant to explore the nature of the evidence cited and assess their fitness for purpose.

Inclusion and exclusion criteria

For the purpose of the review, guidelines were defined as a statement by or for health professionals that outlined recommendations for care of dying previable infants. This definition enabled the inclusion of policies, protocols and practice standards for the care of dying infants born at 24 weeks' gestation or less. Recommendations for care might include explicit reference to tasks such as providing nutrition or pain relief, or they could include generic terms such as 'comfort care' (NMC, 2007) 'compassionate care' (MacDonald et al, 2002) or 'palliative care' (Nuffield Council on Bioethics, 2006). The guidelines also had to be in the public domain so that they were accessible to practitioners.

Previous research investigating parental participation in ethical decision-making and visiting policies in Europe and Asia demonstrated that there were significant variations in practice between English-speaking and non-English-speaking countries (McHaffie et al, 1999; Partridge et al, 2005). English-speaking countries tended to share a common philosophy in respect of ethical frameworks and parental participation in care. For those reasons, it was decided to include only documents produced in English and intended for use in North America, Australia, New Zealand and the UK. It was also believed that translating guidelines from other languages into English for comparison could mean that subtle nuances or taken-for-granted meanings might be lost or misinterpreted.

The EPICure study in 2000, a population-based study of survival and later health status in extremely premature infants, provided robust information about survival rates of babies born at the threshold of viability and this may have had an impact on the development of guidelines and clinical practice (Costeloe et al, 2000). It was therefore decided to limit the search to the period between 2000 and 2007. Guidelines developed or published before that date, but identified as still being current and informing clinical practice would be included in the review.

Guidelines that focused exclusively on the ethical or clinical decision-making process about the need for resuscitation and care were excluded from the review. Guidelines that referred exclusively to the withdrawal of care from infants without making specific reference to previable infants were also excluded, as the intended focus of the review was the care of infants of less than 24 weeks' gestation. For example, the report of Nuffield Council on Bioethics (2006) was excluded from the review as it made general recommendations about the need for professionals to agree guidelines for palliative care of previable infants, while the guidelines produced by the Stillbirth and Neonatal Death Society (SANDS) were included because they made specific reference to forms of care that health professionals should deliver to previable babies who were not to be resuscitated (SANDS, 2007).

Search strategy

Assigning key words for the search was problematic as there is no agreed terminology to describe babies of less than 24 weeks' gestation. The following terms have all been used to refer to babies born at less than 24 weeks' gestation: 'very preterm', 'extremely low birthweight' (Marlow, 2004); 'threshold of viability', 'extremely preterm' (MacDonald et al, 2002); 'non viable' (Macfarlane et al, 2003); 'border of viability', 'periviable' (Higgins et al, 2005); 'previable' (British Association of Perinatal Medicine (BAPM), 2000). It was decided to use all the terms identified to search relevant databases. The terms were combined with 'guidelines' using Boolean connectors or by using search limits, where available. Some databases also permitted the use of further limits. Where additional limits were allowed, those used included 'English language', 'human', and 'title and abstract'.

The following databases were searched: PubMed, MEDLINE, CINAHL, Science Direct, SCOPUS and MIDIRS. The websites of professional organisations related to midwifery, obstetric and neonatal nursing, paediatrics and gynaecology from North America, New Zealand, Australia and the UK were also searched as were the following guideline collections: National Library of Guidelines, Scottish Intercollegiate Guidelines Network, National Institute for Health and Clinical Excellence (NICE) and the National Guideline Clearinghouse. Midwifery

Table 2. Appraisal of Guidelines for Research and Evaluation Domains (AGREE) instrument (AGREE, 2001), showing those included and excluded from each source

Domain	Questions
Scope and purpose	The overall objectives of the guidelines are specifically described. The clinical questions covered by the guidelines are specifically described. The patients to whom the guideline is meant to apply are specifically described.
Stakeholder involvement	The guideline development group includes individuals from all the relevant professional groups. The patients views and preferences have been sought. The target users of the guidelines are clearly defined. The guideline has been piloted among target users.
Rigour of development	Systematic methods were used to search for evidence. The criteria for selecting the evidence are clearly described. The methods used for formulating the recommendations are clearly described. The health benefits, side-effects and risks have been considered in formulating the recommendations. There is an explicit link between the recommendations and the supporting evidence. The guideline has been externally reviewed by experts prior to its publication. A procedure for updating the guideline is provided.
Clarity and presentation	The recommendations are specific and unambiguous. The different options for management of the condition are clearly presented. Key recommendations are easily identifiable. The guideline is supported with tools for application.
Applicability	The potential organisational barriers in applying the recommendations have been discussed. The potential cost implications of applying the recommendations have been considered. The guideline presents key review criteria for monitoring and/or audit purposes.
Editorial independence	The guideline is independent from the funding body.

online discussion groups and a perinatal network were contacted to ensure that guidelines not appearing in national collections or in the public domain were included.

Titles and abstracts were scrutinised. Where these indicated that the paper met the inclusion criteria, or if the title or abstract was ambiguous, the full guideline was obtained. The websites of professional organisations had search facilities, but these were not specific enough to enable the identification of guidelines referring to the care of dying previable babies. This meant that each website was hand-searched, with all potentially relevant documents being downloaded and scrutinised. Reference lists (where available) were also examined for relevant guidelines. Guidelines that were excluded from the review were checked by three reviewers to ensure rigour in the final selection of guidelines for the review.

Table 1 shows the total number of guidelines retrieved, exclusions and inclusions. The majority of papers excluded from the study focused on ethical decision-making in relation to the provision of resuscitation and ongoing support in the case of previable birth; and those that focused on withdrawal of care without making specific reference to the care of previable babies. Some guidelines were retrieved from multiple sources. Where this occurred, the guideline was attributed to the first source and then excluded from later searches.

A total of six guidelines were identified (see Table 1). Of the six guidelines retrieved, four were from the UK (SANDS, 2007; Thames Regional Perinatal Group, 2000; BAPM, 2000; NMC, 2007). The remaining two guidelines were from North America (MacDonald et al, 2002; Canadian Paediatric Society, 1994). No guidelines from Australia were identified. Five guidelines were available on the internet. The guidelines for professionals developed by SANDS were available to buy at a cost of £16.99. It was decided by the review group that the guidelines still met the criteria of being in the public domain and so they were included.

Analysis

To undertake the critical analysis of the guidelines, the research team used the Appraisal of Guidelines for Research and Evaluation (AGREE) instrument (AGREE Collaboration, 2001). This tool has been developed and validated for the evaluation of clinical guidelines (AGREE Collaboration Writing Group, 2003). The AGREE instrument provides a structure to assess the quality of the process of guideline development and the quality of the recommendations. However, it is unable to assess the impact on outcomes.

The AGREE instrument consists of 23 questions organised into six domains (see Table 2). The domains address different aspects of guideline quality (AGREE Collaboration, 2001). Each item has a four-point scale that ranges from strongly agree to strongly disagree, with two mid-point scores. Each item also has accompanying explanatory notes to enable the appraiser to clarify the meaning behind the questions. It is recommended that each guideline is appraised by a minimum of two people using the instrument. For maximum reliability, four appraisers are recommended. For this evaluation, four appraisers participated.

Three appraisers were associated with a doctoral project evaluating ritual processes in the care provision for dying previable babies. Of these three, one is a midwifery academic with experience of caring for neonates; one is a professor of family health with a special interest in child protection; and the third is an anthropologist who also trained as a nurse. The fourth appraiser was a nurse academic with expertise in neonatal intensive care.

Before undertaking the analysis of the guidelines, the AGREE tool was piloted with a group of students undertaking doctoral programmes of research in the College of Medicine, Dentistry and Nursing at the School of Nursing and Midwifery. As a result of carrying out the pilot analysis, it was established that only the part of the guideline relating to the care of the dying previable

Table 3. Application of the AGREE instrument to guidelines*

Domain question	SANDS	Thames Regional Perinatal Group	British Association of Perinatal Medicine	American Academy of Pediatrics	Canadian Paediatric Society	NMC
Scope and purpose	47.2%	50%	38.8%	61%	55%	38.8%
Stakeholder involvement	68.75%	22.9%	12.5%	16.6%	22.9%	22.9%
Rigour of development	26.1%	10.7%	1.19%	21.4%	20.2%	30.9%
Clarity and presentation	39.5%	2.08%	2.08%	14.58%	10.4%	18.75%
Applicability	19.45%	8.33%	0%	0%	5.5%	0%
Editorial independence	12.5%	12.5%	12.5%	12.5%	20.8%	25%

*A domain score of less than 40% was obtained where at least two appraisers awarded scores of 2 or less (disagree or strongly disagree) for each question in the domain. A score of 50% or more was obtained where at least two appraisers awarded scores of 3 or more (agree or strongly agree) to each question in the domain

baby should be evaluated. Most of the guidelines had embedded this information in the wider framework addressing decision-making and care of babies who were to be resuscitated. From the pilot, it was clear that there were potentially significant differences in the way the different outcomes were considered and analysing the guideline as a whole would lead to skewing of the results related to the care of dying previable babies.

For example, several guidelines addressed the needs of previable infants who were to be resuscitated and provided recommendations based on randomised controlled trials (MacDonald et al, 2002; Canadian Paediatric Society, 1994). Where there was a lack of evidence in relation to specific approaches to care, this ambiguity was clearly acknowledged (MacDonald et al, 2002; Canadian Paediatric Society, 1994). The section on caring for dying previable babies, however, would not acknowledge the evidence base (or lack of it). The reviewers decided that it was important that the section on caring for dying previable babies should stand on its own in order to be reviewed in each of the guidelines.

Findings

To facilitate evaluation and comparison of the guidelines, the findings are presented using the domains specified in the AGREE instrument. Table 3 shows the percentage scores for each domain for the guidelines. The percentage scores are obtained using the formula advised by the AGREE Collaborative Group to obtain a standardised domain score. To evaluate a guideline using the instrument, the score for each domain is added up and scored as a percentage. This is not particularly helpful to the reader in understanding the relationship between the percentage scores and the way in which they were scored by the individual appraisers. In this study, a domain score of less than 40% was obtained where at least two appraisers awarded scores of two or less (disagree or strongly disagree) for each question in the domain. A score of 50% or more was obtained where at least two appraisers awarded scores of three or more (agree or strongly agree) to each question in the domain.

The AGREE Collaboration suggests that domain scores should not be aggregated and that it is impossible to set scores against a threshold score for 'good' or 'bad' guidelines (AGREE Collaboration, 2001). Instead, it is recommended that the appraiser makes an overall judgement about the quality of the guideline at the end of the assessment.

Scope and purpose

NICE recommends that guidelines should have specific aims and objectives and the expected health benefits or outcomes should be identified (NICE, 2007). The population for whom the guideline is intended should also be specified to enhance the use of the guideline (NICE, 2007). This information assists health professionals when searching for relevant guidelines.

Five guidelines indicated that the previable baby was the focus of the guideline (MacDonald et al, 2002; NMC, 2007; Thames Regional Perinatal Group, 2006; BAPM, 1994; SANDS, 2007). One guideline referred to the woman as the focus of care (Canadian Paediatric Society, 1994). The lack of focus in the guideline title could mislead professionals when searching for information.

Stakeholder involvement

In developing a guideline for clinical practice, it is essential that those involved have the relevant expertise (Woolf et al, 1999). The guideline development group should also reflect the range of disciplines using it. In evidence-based care, the experiences and expectations of healthcare consumers should be taken into account when developing the guidelines and the process should be included in the final guideline (van Wersch and Eccles, 2001; NICE, 2008). It is recommended that the guideline should make explicit reference to the target users. If the target audience is not specified in the guideline, then it is possible that potential users may not be aware of the relevance of the guideline to their practice. The guideline should be piloted or tested with relevant user-groups as part of the development process and this should be recorded in the published guideline (AGREE Collaboration, 2001).

Three guidelines indicated that they had been prepared on behalf of an organisation or committee, but no further information was given about the individuals who participated in the development process (BAPM, 2000; NMC, 2007; Thames Regional Perinatal Group, 2000). Three guidelines gave details of professional employment details or professional qualifications (MacDonald et al, 2002; Canadian Paediatric Society, 1994; SANDS, 2007). One guideline included details of professionals and parents who had been involved in the guideline development (SANDS, 2007). While this guideline did indicate that parent experience had informed the development of the guideline, there was no information about the representativeness of the group and how the parents had been recruited.

Two guidelines provided explicit information about the

nature of the guideline and the target audience (Canadian Paediatric Society, 1994; MacDonald et al, 2002). Midwives and nurses are likely to be the main providers of care to the dying previable baby. One guideline mentioned this group by name as target users (NMC, 2007). Generic terms such as 'clinicians' and 'other members of the healthcare team' were used by guidelines (Thames Regional Perinatal Group, 2000; MacDonald et al, 2002; Canadian Paediatric Society, 1994). One guideline provided no information about the specific target group for the guideline, but did refer to 'obstetricians, paediatricians, midwives, nurses and other supporting professionals' in the text (BAPM, 2000).

Rigour of development

Guidelines should be based on the best available evidence to enable practitioners to deliver care that is safe and effective. A guideline can only be as good as the evidence that informs its development. For that reason, the process of gathering and analysing the evidence and formulating the recommendations should be included in the guidelines. It is also considered good practice to submit guidelines to peer review before publication. The AGREE collaboration suggests that this should include people with appropriate professional and methodological expertise (AGREE Collaboration, 2001). Some guidelines may be reviewed by consumer representatives at this stage in their development. Since guidelines need to be informed by current evidence in order to be effective, it is considered to be good practice to include information about the updating process or including a review date in the guidelines (AGREE Collaboration, 2001).

None of the guidelines provided information about search strategies or inclusion and exclusion criteria. One guideline was unsupported by any references (BAPM, 2000). This guideline, however, was cited as 'evidence' by another guideline (NMC, 2007). It was not clear how the references to support the recommendations had been selected in the remaining guidelines. An explicit link between the recommendations and the supporting references was missing in all of the guidelines. None of the guidelines provided any critique of the cited evidence relating to the care of dying previable babies or an indication of the quality of the evidence.

One guideline stated that external reviewers had been consulted and listed them in the guideline; however, no information was given as to the appraisal process (SANDS, 2007). One guideline was in the process of being reviewed (Canadian Paediatric Society, 1994). Another guideline indicated a review date (MacDonald et al, 2002). None of the remaining guidelines provided information about updating procedures.

Guidelines and recommendations usually come with an assessment of health benefits and risks, and balance these against the potential costs. The guideline produced by SANDS (2007) did make explicit the potential health benefits to society in ensuring the wellbeing and recovery of parents after the death of a previable baby. However, the potential risks associated with the approach – the distress parents might feel at holding their baby when treatment was futile was not addressed. The potential costs of having to provide skilled support over a period of time to enable parents to interact with their dying baby was not addressed in any of the guidelines.

Clarity and presentation

This domain considers the way in which the options for care are presented and the dissemination and implementation strategy. It is suggested that the recommendations should be stated clearly and be easy to find. The guidelines should be precise about specific management approaches and determined by the body of evidence. If there is uncertainty about management then this should be reflected in the guideline (AGREE Collaboration, 2001). This domain also covers the dissemination and implementation strategy for the guidelines.

In the previous section, it was shown that the evidence base for the guidelines was poor. This made it difficult for the guidelines to be specific about the potential ways of managing care. The way in which care was described was vague and unlikely to be helpful to practitioners, for example, 'the use of opiates to provide a comfortable and dignified death may be entirely appropriate' (Thames Regional Perinatal Group, 2000). The guideline does not give any indication of how the need for opiates would be assessed, the dose and the possible routes of administration.

The recommendations for the care of the dying previable baby were embedded in guidelines and were difficult to isolate (NMC, 2007; Thames Regional Perinatal Group, 2000; MacDonald et al, 2002; BAPM, 2000; Canadian Paediatric Society, 1994). One guideline had an identified chapter on late pregnancy loss and the care of the dying previable baby was given a heading that enabled it to be isolated from other information in the chapter (SANDS, 2007).

Two guidelines had been published in journals read by a range of professionals (MacDonald et al, 2002; Canadian Paediatric Society, 1994). One guideline was distributed to key users (NMC, 2007). The remaining guidelines were available on a specialist website (Thames Regional Perinatal Group, 2000; BAPM, 2000). Only one guideline came with clear recommendations and suggestions for dissemination (SANDS, 2007).

Applicability

Applying the guideline recommendations may require additional resources or changes in practice. This domain assesses the extent to which the barriers to implementation have been addressed and how adherence to the recommendations can be assessed. This was missing from five guidelines. One guideline identified the need for staff training to implement the recommendations and criteria for review (SANDS, 2007). None of the guidelines discussed possible audit or review criteria to assess how the guideline for the care of the dying previable baby was being used in practice.

Editorial independence

This domain refers to the need to make explicit the relationship between funders and the guideline development process. It also relates to potential conflicts of interests experienced by members of the development group. The AGREE evaluation tool recommends that there should be an explicit statement relating to potential conflicts of interest (AGREE Collaboration, 2001).

None of the guidelines had explicit statements relating to the interests of the guideline developers or funding. One guideline was developed by a charity who then offered it for sale (SANDS, 2007). It was recognised by the reviewers that the

current focus on perinatal loss came about because of the work carried out by consumer groups and their prominent use of their logo could be regarded as an explicit statement about their 'interest' in the guidelines.

Overall assessment of guidelines

The AGREE evaluation tool suggests that there should be an overall assessment of the quality of the guideline based on scores achieved for each of the domains and the judgement of the appraiser (AGREE Collaboration, 2001). Four options are available: 'strongly recommend', 'recommend with provisos or alterations', 'would not recommend' and 'unsure'.

The overall assessment for all six of the guidelines from each reviewer was 'would not recommend'. The main reason expressed for this judgement was the lack of rigour in the development of the guidelines that then impacted on the validity of the recommendations for care.

Discussion

The search strategy used for this review was able to detect current guidelines for the care of the dying previable baby produced in the UK and North America. While there has been extensive debate around the ethics of resuscitation policies for previable babies and outcomes of care, very little work has been undertaken to assess the quality of the guidelines for care when resuscitation is withheld (Boyle et al, 2004; Lucey et al, 2004; Janvier and Barrington, 2005).

The evidence base for guidelines is considered to be crucial in determining the validity of the guideline and its credibility for use by health professionals and consumers. Guidelines relating to other aspects of neonatal care such as resuscitation, and treatment modalities, such as neonatal surfactant therapy, follow the agreed convention of listing evidence and assessing it according to hierarchies of evidence (Penney and Cameron, 2004; Canadian Paediatric Society, 2005). However, the guidelines relating to the care of the dying previable baby were descriptive with no direct link between the recommendations and evidence. In particular, the lack of an evidence base to support the recommendations was not acknowledged. The fact that an evidence base to support care is missing could be an important starting point for further research.

Providing palliative care is a complex activity. It requires a multidisciplinary team that includes specialist nurses and doctors, counsellors and often voluntary organisations, such as hospices (Ramer-Chrastek, 2005). The situation in relation to palliative care provision in previable babies is more problematic. The baby may live from a few minutes to a few hours. The issue of identifying and relieving pain in the preterm infant is difficult, as the infant is unable to vocalise and immature muscle activity reduces physical responses to pain and discomfort. Neonatal assessment scales are available, but they require intensive training to use and their reliability in assessing the needs of dying previable infants has not been tested (Westrup, 2007).

Guidelines and algorithms are designed to assist practitioners in decision-making. Examples of these include resuscitation algorithms (Resuscitation Council UK, 2005) and guidelines for decision-making around the mode of birth after a previous caesarean section (Montgomery et al, 2007). However, decision-making around providing care for dying previable infants can be fraught with emotionally difficult choices as staff try to achieve the ideal of creating a 'good death' for the infant and lasting memories for the parents. It may be difficult for guidelines that adopt a linear format to portray the complicated processes that health professionals must negotiate in order to provide effective care.

Caring for dying previable babies is a difficult area to research. There are ethical issues around recruitment of parents and babies at a critical time, where there may be limited opportunity for the parents to reflect on their involvement in the study. Parents may feel strongly about certain aspects of care such as holding or dressing the baby so a trial-based approach would be inappropriate (Rådestad et al, 2008). Guidelines should make explicit the lack of evidence base for their recommendations. It enables staff to exercise caution when implementing the guidelines and may help stimulate further research into areas such as pain relief and parental support.

The AGREE evaluation instrument is a relatively new tool by which to assess guideline quality. Its use requires practice both in terms of familiarisation with the domain criteria and its application to guidelines to ensure consistency of use between reviewers. Although the tool was used for a very specific set of guidelines, the questions posed by the tool were of a generic nature and could be applied to almost any guideline. However, it is important at the outset to agree on certain parameters, for example, how stakeholders are defined. Rigorous pre-application briefings and piloting before using the tool might enhance the reliability of it. Alternatively, a consensus-based approach to its application could be used.

The application of the tool does not take into account the range of scores between the appraisers, but combines all the scores to obtain an 'aggregate' score. The method of scoring does not allow for 'deviations' to be calculated and this is a potential weakness of it. In this particular assessment where there were low scoring domains, there was good agreement. However, there were variations between assessors in the domains that achieved higher scores. The reason for this was unclear and requires further investigation to explore different understandings of the application of the AGREE tool.

Having assessed six guidelines using the AGREE tool, the main advantages of it appear to lie in the provision of specific criteria for the review and a scoring system that enabled a value to be placed on the individual domains by reviewers. This makes it possible for the domains to be compared across several guidelines and it also enables 'weak' or 'strong' areas of the guideline to be identified readily. The value of the percentage scoring system is less obvious and the authors would recommend that further work is done to evaluate the reliability of the numerical score against a qualitative score, for example, 'poor' or 'good'.

Conclusion

The guidelines included in this review were available in the public domain to inform the care given to dying previable babies. The review cannot determine if the care actually delivered in practice follows the recommendations. What has been established is that the process for developing the guidelines for dying previable babies lacks a systematic approach and appears to be based on description and opinion, rather than evidence.

Future guideline development should be based on the principles proposed by NICE (2007) as this embraces the concept of transparency and rigour. The use of the approach adopted by NICE could help identify where evidence currently exists and could direct future research into providing care for this group of vulnerable babies and their families. The use of the AGREE instrument requires further work to explore its reliability and validity as a tool to evaluate guidelines.

References

AGREE Collaboration. (2001) *Appraisal of guidelines for research and evaluation*. See: www.agreecollaboration.org/instrument (accessed 24 November 2008).

AGREE Collaboration. Writing Group: Cluzeau FA, Burgers JS, Brouwers M, Grol R, Mäkelä M, Littlejohns P, Grimshaw J, Hunt C. (2003) Development and validation of an international appraisal instrument for assessing the quality of clinical practice guidelines: the AGREE project. *Quality and Safety in Health Care* **12(1)**: 18-23.

Boyle RJ, Salter R, Arnander MW. (2004) Ethics of refusing parental requests to withhold or withdraw treatment from their premature baby. *Journal of Medical Ethics* **30**: 402-5.

British Association of Perinatal Medicine. (2000) *Fetuses and newborn infants at the threshold of viabilty a framework for practice*. See: www.bapm.org/media/documents/publications/threshold.pdf (accessed 24 November 2008).

Canadian Paediatric Society. (1994) Management of the woman with threatened birth of an infant of extremely low gestational age. *Canadian Medical Association Journal* **151(5):** 547-51, 553.

Canadian Paediatric Society. (2005) Recommendations for neonatal surfactant therapy. *Paediatrics and Child Health* **10(2)**: 109-16.

Costeloe K, Hennessy E, Gibson AT, Marlow N, Wilkinson AR, EPICure Study Group. (2000) The EPICure study: outcomes to discharge from hospital for babies born at the threshold of viability. *Pediatrics* **106**: 659-71.

Higgins RD, Delivoria-Papadopoulos M, Raju TNK. (2005) Executive summary of the workshop on the border of viability. *Pediatrics* **115**: 1392-6.

Janvier A, Barrington KJ. (2005) The ethics of neonatal resuscitation at the margins of viability: informed consent and outcomes. *Journal of Pediatrics* **5**: 579-85.

Kain VJ. (2006) Palliative care delivery in the NICU: what barriers do neonatal nurses face? *Neonatal Network* **25(6)**: 387-92.

Lucey JF, Rowan CA, Shiono P, Wilkinson AR, Kilpatrick S, Payne NR, Horbar J, Carpenter J, Rogowski J, Soll RF. (2004) Fetal infants: the fate of 4172 infants with birthweights of 401 to 500 grams – The Vermont Oxford network experience (1996 to 2004). *Pediatrics* **113**: 1559-6.

MacDonald H, Committee for the Fetus and Newborn. (2002) Perinatal care at the threshold of viability. *Pediatrics* **110(5)**: 1024-7.

Macfarlane PI, Wood S, Bennett J. (2003) Non-viable delivery at 20 to 23 weeks' gestation: observations and signs of life after birth. *Archives of Disease in Childhood Fetal and Neonatal Edition* **88**: F199-202.

McHaffie H, Cuttini M, Brolz-Voit G, Randag L, Mousty R, Duguet AM, Wennergren B, Benciolini P. (1999) Withholding/withdrawing treatment from neonates: legislation and official guidelines across Europe. *Journal of Medical Ethics* **25(6)**: 440-6.

Marlow N. (2004) Neurocognitive outcome after very preterm birth. *Archives of Disease in Childhood Fetal and Neonatal Edition* **89(3)**: F224-8.

Montgomery A, Emmett CL, Fahey T, Jones C, Ricketts I, Patel RR, Peters TJ, Murphy DJ. (2007) Two decision aids for mode of delivery among women with previous caesarean section: randomised controlled trial. *British Medical Journal* **334(7607)**: 1305-12.

Moro T, Kavanaugh K, Okuno-Jones S, Vankleef JA. (2006) Neonatal end of life care: a review of the research literature. *Journal of Perinatal and Neonatal Nursing* **20(3)**: 262-73.

National Institute for Health and Clinical Excellence. (2007) *The guidelines manual*. See: www.nice.org.uk/niceMedia/pdf/GuidelinesManualChapter13.pdf (accessed 9 April 2008).

National Institute for Health and Clinical Excellence. (2008) *Patient and public involvement policy*. See: www.nice.org.uk/getinvolved/patientandpublicinvolvement/patientandpublicinvolvementpolicy/patient_and_public_involvement_policy.jsp (accessed 9 April 2008).

Nuffield Council on Bioethics. (2006) *Critical care decisions in fetal and neonatal medicine: ethical issues*. Nuffield Council on Bioethics: London.

NMC. (2007) *The care of babies born alive at the threshold of viability 03/ NMC circular*. NMC: London.

Partridge JC, Martinez AM, Nishida H, Boo N, Tan KW, Yeung C, Lu J,Yu VYH. (2005) International comparison of care for very low birthweight infants: parents' perceptions of counselling and decision-making. *Pediatrics* **116(2):** e263-71.

Penney GC, Cameron MJ. (2004) A*ntenatal corticosteroids to prevent respiratory distress syndrome*: *guideline no* 7. RCOG: London.

Rådestad P, Surkan PJ, Steineck G, Cnattingius S, Onelöv E, Dickman PW. (2008) Long-term outcomes for mothers who have or have not held their stillborn baby. *Midwifery* (In press).

Ramer-Chrastek J. (2005) A perinatal hospice for an unborn child with a life limiting condition. *International Journal of Palliative Care* **11(6):** 274-6.

Resuscitation Council (UK). (2005) *The resuscitation guidelines*. See: www.resus.org.uk/siteindx.htm (accessed 7 April 2008).

RCOG. (2005) *Response of the Ethics Committee of the Royal College of Obstetricians and Gynaecologists to Nuffield Council on Bioethics Consultation Document. The ethics of prolonging life in the fetus and newborn*. See: http://weblearn.ox.ac.uk/site/conted/biosci/ethicsbiosci/eb_content/ReadingGuides/RCOGResponseToNuffieldConsultation.pdf (accessed 26 November 2008).

Royal College of Paediatrics and Child Health. (2004). *Withholding or withdrawing life-saving treatment in children: a framework for practice (second edition)*. RCPCH: London.

Stillbirth and Neonatal Death Society. (2007) *Pregnancy loss and the death of a baby: guidelines for professionals 3E*. SANDS: London.

Saunders C. (1996) A personal therapeutic journey. *British Medical Journal* **313(7072):** 1599-601.

Thames Regional Perinatal Group. (2000) *Guidelines relating to the birth of extremely immature babies 22 to 26 weeks' gestation.* See: www.bapm.org/media/documents/publications/immature.pdf (accessed 24 November 2008).

van Wersch A, Eccles M. (2001) Involvement of consumers in the development of evidence-based clinical guidelines: practical experiences from the North of England evidence-based guideline development programme. *Quality and Safety in Health Care* **10**:10-6.

Vanhaesebrouck P, Allegaert K, Bottu J, Debauche C, Devlieger H, Docx M, Francois A, Haumont D, Lombet J, Rigo J, Smets K, Vanherreweeghe I, van Overmeire B, Van Reempts P. (2004) The EPIBEL study: outcomes to discharge from hospital for extremely preterm infants in Belgium. *Pediatrics* **114(3)**: 663-75.

Westrup B. (2007) Newborn individualized developmental care and assessment program (NIDCAP) – family-centered developmentally supportive care. *Early Human Development* **83(7)**: 443-9.

Woolf SH, Grol R, Hutchinson A, Eccles M, Grimshaw J. (1999) Potential benefits, limitations and harms of clinical guidelines. *British Medical Journal* **218**: 527-30.

Information for authors

Evidence Based Midwifery is published quarterly and aims to promote the dissemination, implementation and evaluation of midwifery evidence at local, national and international levels. Papers on qualitative research, quantitative research, philosophical research, action research, systematic reviews and meta-analyses of qualitative or quantitative data are welcome. Papers should be sent to: maura@redactive.co.uk in MS Word, and receipt will be acknowledged. Suitable papers are subject to double-blinded peer review of academic rigour, quality and relevance. Subject area and/or methodology experts provide structured critical reviews that are forwarded to authors with editorial comments. Expert opinion on matters such as statistical accuracy, professional relevance or legal ramifications may also be sought. Major changes are agreed with authors, but editors reserve the right to make modifications in accordance with house style and demands for space and layout. Authors should refer to further guidance (RCM, 2007; Sinclair and Ratnaike, 2007). Authorship must be attributed fully and fairly, along with funding sources, commercial affiliations and due acknowledgements. Papers that are not original or that have been submitted elsewhere cannot be considered. Authors transfer copyright of their paper to the RCM, effective on acceptance for publication and covering exclusive and unlimited rights to reproduce and distribute it in any form. Papers should be preceded by a structured abstract and key words. Figures and tables must be cited in the text, and authors must obtain approval for and credit reproduction or modification of others' material. Artwork on paper is submitted at the owner's risk and the publisher accepts no liability for loss or damage while in possession of the material. All work referred to in the manuscript should be fully cited using the Harvard system of referencing. All sources must be published or publicly accessible.

References

RCM. (2007) Guidelines for authors. *Evidence Based Midwifery* **5**(**1**): 35.

Sinclair M, Ratnaike D. (2007) Writing for *Evidence Based Midwifery*. *Evidence Based Midwifery* **5**(**2**): 66-70.

News and resources

Antiepileptic drug use in pregnancy

A study has found no increased risk of orofacial defects relative to other malformations from using the anitepileptic drug lamotrigine in pregnancy.

It was conducted by the European Surveillance of Congenital Anomalies (EUROCAT) Antiepileptic Drug Working Group and used data from its database, totalling 3.9m births across Europe between 1995 and 2005.

It points out that lamotrigine is such a rare exposure that precise risk estimates for individual malformations cannot be derived and further surveillance will be necessary. It also says that because it lacked a control of non-malformed babies, it could not address the overall risk of malformation.

Reference

Dolk H, Jentink J, Loane M, Morris J, de Jong-van den Berg LTW and the EUROCAT Antieplietpic Drug Working Group. (2008) Does lamotrigine use in pregnancy increase orofacial cleft risk relative to other malformations? *Neurology* **71**: 714-22.

Research fellowship

Midwife Julie Wray has been awarded the Iolanthe Midwifery Trust 2008 research fellowship. The award will fund the final phase of her doctorate on postnatal care, which she is pursuing at the University of Salford.

Two other midwives have also won awards. University of Southampton's Elsa Montgomery received funding to attend courses in interviewing skills for her PhD exploring maternity care for women who have experienced sexual abuse. Iolanda Serci is being funded to attend a US congress on fatty acids and lipids for her PhD on perinatal depression and nutrition.

Applications for the 2009 annual midwife and student awards opened in November. More details can be found at: www.iolanthe.org/awards

Factual correction

The editors of *Evidence Based Midwifery* would like to draw attention to a factual error in the last issue (September 2008) and confirm that Professor Lesley Page was the first professor of midwifery in the UK.

CONTENTS