Title: The views of pregnant women, midwives and a women’s panel on intrapartum ultrasound research: a pilot study

ABSTRACT

Background

Ultrasound is increasingly used in labour; however little data exists on attitudes to its use. We sought to analyse and compare the views of pregnant women, midwives and a women’s panel on the value and use of ultrasound in labour.

Methods

Focus group involving a short presentation on ultrasound, questionnaire and a question and answer session were held with groups of pregnant women, midwives at 2 inner city maternity units, and a RCOG online Women’s Panel. Data was collected on attitudes to vaginal examination, ultrasound, predicting Caesarean section and the utility of a digital representation of labour.

Results

21 midwives and 29 service users (19 pregnant women and 10 women’s panel members) participated. Significantly more service users saw positive value in intrapartum ultrasound (p=0.0005) and predicting Caesarean section (p=0.03) than midwives. The majority of both groups - 72% (20/29) and 62% (13/21) respectively - thought women would want a digital representation of their labour, with the most popular format being on a mobile phone (56%, 20/36).

Conclusions

Service users were most and midwives least positive about ultrasound versus vaginal examination, indicating divergence between midwives’ perspective of women’s need to understand risk and desire to know about their labour. Women found the non-intrusive nature...
and accuracy of ultrasound valuable while midwives were concerned about de-skilling and medicalisation of birth. All groups felt a graphical representation of labour on a device would be helpful.

**Key Words:** Obstetric Delivery, Patient Involvement, Ultrasonography, Peripartum, Midwifery
INTRODUCTION

Digital vaginal examination (DVE) is widely used to measure the progress of labour. Since DVE is a subjective technique with high intra- and inter-observer variability, ultrasound has emerged as a more objective and reproducible alternative. Ultrasound, being non-invasive, avoids the potential risks of repeated examination including chorioamnionitis and ascending infection. The techniques used are quick to measure, including transabdominal ultrasound to assess fetal head position and transperineal ultrasound to assess fetal head station, cervical dilatation, and caput succedaneum. Recent guidelines now support ultrasound evaluation in labour where there is failure to progress, malpresentation or prior to instrumental delivery.

An important feature of maternity practice is responsiveness to patient choice, particularly when considering intimate and often uncomfortable procedures such as DVE. A recent study in a Belgian population reported that although women in labour prefer ultrasound to DVE, midwives were uncomfortable with the new technique.

We aim to assess pregnant women’s, non-pregnant women’s and midwives’ opinion of the value of intrapartum ultrasound. We also seek to determine how women would respond to prediction of Caesarean, and how they would like to visualise their progress of labour.
METHODS
Voluntary focus groups involving a 10-minute presentation on intrapartum ultrasound and subsequent questionnaire were held with consented pregnant women following antenatal classes, as well as groups of midwives in 2 inner-city maternity units. This was modified from a validated questionnaire\(^\text{11}\) assessing 3 domains using Likert scales: the value of DVE; the value of intrapartum ultrasound; and the value of knowing the likelihood of Caesarean section.

An equivalent online session was organised with members of the Royal College of Obstetricians and Gynaecologists Women’s Voices Involvement Panel (WVIP), delivered via email and an online survey (SurveyMonkey, San Mateo, CA, United States) using 5-point scales to assess: initial attitude to intrapartum ultrasound; attitude to vaginal examination; the value of intrapartum ultrasound to a labouring woman; and the value to a labouring woman of knowing her likelihood of Caesarean section. The online survey also assessed the utility and format of a digital representation of labour.

To compare the views of each group, the participants’ scores for the value of ultrasound and the value of predicting Caesarean section were categorised as either positive, neutral, or negative. For pregnant women and midwives, the scale was 1-6, hence grouped as positive (scores 1-2), neutral (scores 3-4) and negative (scores 5-6). Due to the preformatted nature of the online platform, (SurveyMonkey, San Mateo, CA, United States), for WVIP members the scale was 1-5, grouped as positive (scores 1-2), neutral (score 3) and negative (scores 4-5).

A Mann-Whitney test was used to compare positive and negative attitude scores for pregnant women and midwives. A Kruskal-Wallis test and Dunn’s multiple comparisons test were used to compare scores between the 3 groups of participants.

For simplicity, women’s panel members and pregnant women were grouped together as ‘service users’ to aid comparison, and a Fisher Exact test used to compare their scores with those of midwives.

This work did not require research ethics authorisation as we used anonymous aggregated survey data from volunteers at Patient Public Involvement (PPI) focus group meetings and from a women’s voices panel – this work would not be considered research by the NHS.
RESULTS
The quantitative results of the 50 questionnaires are summarised in Table 1. 19 pregnant women completed the questionnaire, of whom 13 women were nulliparous. The median age was 31 years (22-40) and gestation 32 weeks (8-37). 21 midwives completed the questionnaire. Their median age was 37.5 years (27-55). These comprised 8 Labour Ward; 3 Birth Centre; 2 Antenatal Ward; 2 Postnatal Ward; 2 Antenatal Clinic and 4 Community midwives.

For positive attitude scores, where 2=most positive and 12=least positive, the mean scores from pregnant women were 4.3 and 5.7 for ultrasound and DVE respectively (Mann-Whitney p=0.11). The mean scores from midwives were 5.0 and 6.6 respectively (Mann-Whitney p=0.01).

For negative attitude scores, where 4=least negative and 24=most negative, the mean scores from pregnant women were 7.1 and 11.3 for ultrasound and DVE respectively (Mann-Whitney p=0.04). The mean scores from midwives were 9.4 and 13.8 respectively (Mann-Whitney p=0.001).

16 WVIP panellists volunteered to participate, of whom 10 completed the questionnaire. In terms of their ‘first reaction to scanning in labour’ the median score was 2 (1=very positive, 5=very negative).

Differences between Pregnant Women, Midwives, and WVIP members
The scores for the value of intrapartum ultrasound to the labouring woman and of views on predicting Caesarean section are illustrated in Figure 1. For intrapartum ultrasound, 86% (25/29) of service users saw positive value, compared to 35% (7/20) of midwives (Fisher Exact p=0.0005). For predicting Caesarean section, 79% (23/29) of service users saw positive value, compared to 48% (10/21) of midwives (Fisher Exact p=0.03).

The majority of participants in the 3 groups thought women would want to see a digital representation of labour, with no significant difference between service users (72%, 20/29) and
midwives (62%, 13/21) (p=0.76), the most popular format being on a mobile phone (56%, 20/36). Midwives scored highly (median score 1; 1=definitely, 6=not at all) in wanting to be trained and involved in performing scans in labour.

**Qualitative Results**

*Pregnant women*

Some pregnant women cited perceived problems with DVE in their questionnaire, including risk of infection and subjectivity. A recurring theme for pregnant women was increasing knowledge, stating that knowing more about their labour would make them more comfortable, assuming it didn’t add to the ‘more unpleasant aspects of labour’. One woman summarised this sentiment with the phrase ‘to know is to have the power’. Another positive aspect of ultrasound mentioned by pregnant women was in helping to visualise labour progress.

*Midwives*

One midwife echoed pregnant women in saying transperineal ultrasound ‘could offer reassurance that there is good progress and can actually visualise descent down the birth canal’. Several midwives expressed a desire to give their women more information to allow more informed choice, mentioning reassurance and the option to ‘change baby’s position using alternative methods’.

Other midwives expressed concern with ultrasound, major themes included medicalisation of birth:

‘Women have managed to have vaginal births just fine without transperineal scanning. In developing countries, women tend to have minimal VEs anyway as birth is less medicalised’

A concern about frightening labouring women was also raised:

‘I think findings may make mothers in labour frightened and anxious which will have a major impact on the progress of labour. Women are designed to give birth!’

Losing skills in DVE was also a perceived issue:
‘Women have had normal births without this. I believe this is taking away from the skill of the midwife.’

**Women’s Panel**

One panellist commented on the need for alternatives to DVE, describing it as ‘uncomfortable, very subjective and in some instances dehumanising’. Another panellist shared midwives’ concerns about medical professionals losing skills. Midwives and panellists both expressed concerns about ultrasound as a technique, mentioning reliability, inter-observer variability, specificity and sensitivity, and acceptability to the labouring woman.
DISCUSSION

Service users were more positive about intrapartum ultrasound than midwives, however, all were more positive about ultrasound than DVE. The contrast between the pregnant women’s desire for more information about their labour, and the midwives’ desire to protect their client from distressing information is very interesting. Returning to the comment “to know is to have the power”, it is clear that pregnant women want to be given as much information as possible to make the most informed choice in partnership with their healthcare professionals.

There was a concern from midwives regarding loss of their skills in vaginal examination. This could perhaps be addressed by training midwives in intrapartum ultrasound, which most midwives were positive about.

Another aspect of our research has been to assess the acceptability of ultrasound compared to DVE\textsuperscript{12}, which would allow the research team to more readily address women’s concerns about whether or not the scan will be uncomfortable or painful. The feasibility, accuracy and reproducibility of intrapartum ultrasound has also been demonstrated\textsuperscript{13,14} which may also be reassuring to concerned service users.

The finding that the majority of participants in all groups thought labouring women would want to see digital representation of their progress has translated into the development of a mobile phone app ‘Intrapartum’ (for research purposes only) by our group (Available on iOS\textsuperscript{15} and Android\textsuperscript{16}). This allows healthcare professionals to input maternal characteristics and ultrasound values for nulliparous women in the first stage of labour, and the output is the likelihood of vaginal delivery\textsuperscript{17}, aligning with pregnant women’s view that knowing their likelihood of Caesarean section would be ‘Extremely valuable’. The validity of the risk
prediction derived from the app has been recently validated in a different obstetric population.

These results are comparable to the study by Van Adrichem et al., which found that service users preferred ultrasound to DVE, whilst midwives were more sceptical. To our knowledge, no other work has been done looking at the perspective of patients and midwives, although studies have shown that obstetricians (whilst often trained to use ultrasound in labour) are less likely than sonographers to use ultrasound to assess labour progress and consider the ultrasonographic parameters too complex to be applied.

**Strengths and Limitations**

This pilot study has shown relevant findings, although the sample size is relatively small. A strength of this sample is its diversity; pregnant women were captured in all 3 trimesters, across a range of ethnicities, whilst midwives were surveyed from all departments, again across a range of ethnicities. A major limitation of the sample is that the pregnant women were mostly nulliparous, and therefore had no personal experience of labour. Some of the WVIP members commented on past positive/negative birth experiences, and so we did capture the views of some multiparous women. Formal assessment of the effect of parity on views should be expanded upon in future studies.

**Future Considerations**

Building on this work with a larger sample size would allow more ready application of these findings to research practice. Further work might focus on any change in women’s attitude to ultrasound and DVE in comparing antenatally to postnatally, allowing them to reflect on their own experience of labour. There is an appetite for this as the majority of pregnant women surveyed agreed to become part of a Patient Public Involvement network for our research group. Furthermore, there is a paucity of qualitative data on other healthcare professionals in particular Obstetricians, as to their attitude to ultrasound and DVE - particularly in respect to whether
they too are concerned about losing skills and medicalising birth, or are more positive about the use of ultrasound in the labour room.

Implications for Practice
Pregnant women find intrapartum ultrasound preferable to digital vaginal examination to assess labour progress and predict vaginal delivery, supporting the further development of the technique.

CONCLUSION
In this pilot study, overall all groups were more positive about intrapartum ultrasound than digital vaginal examination.

Pregnant women and panel members were most and midwives least positive about ultrasound versus vaginal examination, showing an interesting contrast between midwives’ perspective of women’s need to understand risk and the women’s desire to know about their labour. Women found the non-intrusive nature and accuracy of ultrasound valuable while midwives were concerned about de-skilling and medicalisation of birth.

All groups felt a graphical representation of labour on a device would be helpful.
REFERENCES


**TABLES**

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**Table 1.** Scores given by participants in their respective questionnaires.

**FIGURE LEGENDS**

**Figure 1.** The distribution of attitudes to a) intrapartum ultrasound and b) predicting Caesarean section within each surveyed group.

Line over bars indicates groups were not significantly different (Kruskal Wallis and Dunn’s Multiple Comparisons tests).

*p<0.05 (Fisher Exact test between ‘Service Users’ and Midwives)

† note 1 midwife declined to answer this question
FIGURE 1

a) Value of Intrapartum Ultrasound

- Pregnant Women (n=19):
  - Positive: 84.2%
  - Neutral: 0%
  - Negative: 5.3%

- Women's Panel (n=10):
  - Positive: 90.0%
  - Neutral: 10.0%
  - Negative: 0%

- Midwives (n=20)
  - Positive: 50.0%
  - Neutral: 15.0%
  - Negative: 35.0%

b) Value of Predicting Caesarean Section

- Pregnant Women (n=19):
  - Positive: 84.2%
  - Neutral: 10.5%
  - Negative: 5.3%

- Women's Panel (n=10):
  - Positive: 70.0%
  - Neutral: 20.0%
  - Negative: 10.0%

- Midwives (n=21):
  - Positive: 47.6%
  - Neutral: 28.6%
  - Negative: 23.8%