**A UK based survey of midwives and obstetricians’ knowledge and practice regarding reduced fetal movement**

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**Short title:** UK RFM survey

**Protocol contributors**

The study was designed by Dexter Hayes and Alexander Heazell; the study, data analysis, and manuscript writing will be conducted by Dexter Hayes; Alexander Heazell, Jo Dumville & Tanya Walsh will provide feedback on the first draft and subsequent versions of the manuscript.

**Key words**

Reduced fetal movement, knowledge, practice, obstetrics, midwifery, pregnancy.

**Study flow chart**

1. Participants will be invited to take part in an online survey.

2. Responses will be collected and analysed

3. The study manuscript will be written, published, and disseminated.**STUDY PROTOCOL**

**Introduction**

Concerns about reduced fetal movements (RFM), defined as a decrease or (more latterly) change in a baby’s normal movements *in utero*,[1] lead to presentation at hospital in up to 15% of pregnancies[2] and maternal perception of RFM is associated with adverse pregnancy outcomes such as stillbirth and fetal growth restriction.[3–5]

Current UK guidance from the NHS regarding RFM is to contact a midwife or maternity unit if your baby is moving less than usual or not at all,[6] however, there is a lack of consensus on how RFM pregnancies should be managed clinically. NICE guidelines state that anyone who is pregnant should be advised to contact maternity services with any concerns about fetal movement or in the case of reduced fetal movement after 24+0 weeks, but that the use of structured fetal movement awareness packages (with the AFFIRM trial as an example[7]) has not been shown to reduce stillbirth rates.[8] This guideline states that current practice is to follow recommendations in the NHS Saving Babies’ Lives Care Bundle version 2,[9] which states that pregnant women should be made aware of the importance of reduced fetal movements.

Recommendations within the Royal College of Obstetricians and Gynaecologists (RCOG) Green-top guideline[10] are generally based on evidence rated as ‘B’ or ‘C’, meaning that data are from high quality cohort studies or systematic reviews of these studies, rather than high quality randomised trials or meta-analyses of trials. The strongest recommendation in this guideline is that ultrasound should be carried out to assess fetal morphology in presentations with RFM, this is given an ‘A’ rating. The wide variation in the strength of recommendations may lead to uncertainty in clinical practice; hospitals often have their own protocols and national guidelines are not always adhered to.[11]

A survey of UK midwives and obstetricians published in 2008 found significant variation in both knowledge of reduced fetal movement and its clinical management.[12] Between 4.7 and 12.4% of respondents were unsure of how RFM should be defined and 7.8 to 24.8% were unsure of the role of formal fetal movement counting in clinical practice. This survey also found that the definition of RFM as <10 movements in 12 hours was not supported; subjective definitions were more likely to be defined as adequate (especially by midwives).

At the time of the 2008 survey, NICE guidelines stated that formal fetal movement counting should not be a part of routine antenatal care, this was reflected in the responses as the majority of respondents held negative views about their use; only 5% of obstetricians and 3% of midwives used kick charts in routine antenatal care. The majority of respondents, 70% of obstetricians and 74% of midwives, said that their institution had guidelines for the clinical management of RFM in pregnancy. Knowledge of reported associations with RFM and adverse pregnancy outcomes, such as fetal growth restriction (FGR) and fetal hypoxia, was variable.

The RCOG guideline has been updated and reviewed in this time but there is still recognised to be a lack of evidence rated as high quality on which to base recommendations. Several large trials of interventions to prevent adverse outcomes in RFM pregnancies have been published,[7,13] which may have influenced practice. Recent studies in this area such as those by Akselsson et al.[14] and Flenady et al[15] focus on being mindful of fetal movements and presenting to hospital in cases of deviations from normal movement, rather than kick counting using pre-specified ‘alarm limits’. Notably, neither of these studies recommended management for women presenting with RFM.

A systematic review and meta-analysis of intervention studies for RFM, (Hayes et al., unpublished data) which included 18 studies, showed wide variation in terms of what was considered standard care at different study sites. This suggests that national guidelines are still not followed at all hospitals; a finding that is corroborated by two reviews of clinical practice guidelines regarding RFM.[16,17] Hayes et al. found that it is uncertain whether fetal movement counting, compared with standard care, leads to a difference in the rate of stillbirth and found a lack of evidence for effects of other forms of clinical management on stillbirth; meta-analysis of data from studies of fetal movement counting suggested that fetal movement counting may lead to an increase in maternal-fetal attachment with no associated change in maternal anxiety.

A survey of UK midwives and obstetricians will explore whether knowledge of RFM and clinical practice concerning RFM pregnancies has changed over the past decade and will highlight areas of practice to improve.

**Methods**

Aim

This study aims to survey UK-based clinicians in order to describe knowledge and practice around RFM, to determine whether this has changed since the 2008 survey, and if this relates to guidelines or studies that have been published during this time. We are interested in whether opinions regarding definitions of RFM have changed in the past decade, and whether opinions of kick charts and their usage reflects this.

Objectives

1. To survey UK-based clinicians about their RFM knowledge and practice;

2. To see if responses by midwives and obstetricians differ;

3. To investigate whether any other factors, such as country of residence and the presence of guidelines, are linked to certain responses;

4. To compare responses with a previous survey in order to determine if there have been changes over time;

5. To disseminate the results of the survey.

Design

This will be a cross sectional UK-based survey of midwives and obstetricians, and will be structured in the same way in order to facilitate comparison with UK guidelines and with the survey by Heazell et al. (2008). This survey will be online rather than postal; this is in order to easily maximise its reach and a reflection of how research is now conducted. However, we do acknowledge that some potential participants (those without internet access or who do not feel comfortable using the internet) may be excluded by this approach.

The survey will be comprised of five sections: 1. Demographics of participants, including whether they work part or full time, their area of practice, years of experience, and whether they work for the NHS or privately; 2. Asking women about RFM, knowledge of and attitudes towards fetal movement counting; 3. Definitions of RFM and their acceptability; 4. Clinical management of RFM pregnancies, and; 5. Knowledge of associations of RFM with adverse outcomes and other characteristics.

Participants will be asked to elaborate on their answers, providing reasoning and justifications where appropriate. A five point scale (strongly agree, agree, unsure, disagree, strongly disagree) will be used for questions that ask about the acceptability of definitions of RFM or its management. The survey questionnaire is included as an **Appendix**.

Scope

The purpose of this survey is to describe knowledge and practice relating to RFM in the UK; this will identify areas where knowledge is lacking or where practice could be improved, but will also give an overview of these areas and how much they are influenced by the current guidelines.

Responses may not be applicable to other countries or income settings, however, this may be an avenue for future research.

Participants and sampling

Anyone who is currently practising, or has practised, as a midwife or obstetrician in the UK is eligible to take part. There are no inclusion or exclusion criteria based on other demographic criteria.

Participants will be recruited by contacting relevant organisations (such as the Royal College of Midwives and the British Maternal Fetal Medicine Society) and asking them to disseminate the survey to their members. We will also contact authors of studies about RFM who are based in the UK. The survey will be advertised using social media.

We will aim for a sample size of 200 in order to facilitate comparisons with the previous survey, however, as the response rate for the previous survey was fairly low (30% for clinicians and 34% for midwives), we will not put an upper limit on the number of potential participants that we will approach.

We will aim to collect responses from all countries in the UK and for as many areas as possible within these countries. Participants will be encouraged to forward the survey to other people who are eligible and may be interested.

Participants will be provided with an information sheet describing the study and its aims and what participation would entail. Consent to take part in the survey will be ensured by requiring participants to click an ‘I agree to take part’ box before gaining access to the survey.

Analysis

Data will be collected using REDCap software and exported to Microsoft Excel for analysis. Descriptive statistical analysis will be performed and the Chi-squared test or Fisher’s exact test will be used to assess statistical differences in responses, and a p value of <0.05 will be considered as statistically significant.

Dissemination

The results of the survey will be published in an open access journal and findings will be publicised using social media. In addition, we plan to present the results of the survey at national and international conference and through relevant professional organisations.

**Funding**

Financial support for this study was provided by Tommy’s the baby charity in the form of salary for Dexter JL Hayes; Tommy’s had no role in the study design and will have no role in the study conduct, data analysis and interpretation, manuscript writing, or dissemination of results.

**Ethical approval**

Ethical approval is not required for this study. Participants will receive all information about the study when they are invited to take part. Consent will be obtained from participants. All responses to the survey will be confidential. Participants will have the right to withdraw at any point.

**Patient and Public Involvement**

No aspects of the research process will actively involve members of the public.

**Protocol compliance**

Accidental deviations from the protocol will be adequately documented and reported to the Chief Investigator and Sponsor immediately.

**Data protection and patient confidentiality**

All responses to the survey will be confidential and participants are not required to provide any data that may identify them. Email addresses of potential participants and relevant organisations will be stored on a secure server only accessible by study investigators and will be deleted after study publication. Dexter Hayes is the data custodian and will have access to the full dataset.

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**Appendix**

**A UK based survey of midwives and obstetricians’ knowledge and practice regarding reduced fetal movement – Questionnaire**

Thank you for choosing to take part in this survey. This questionnaire contains 15 questions for you to answer about your knowledge and practice in relation to reduced fetal movement in pregnancy. Please elaborate on your answers and give reasoning where possible/applicable.

1. Are you completing this survey as someone who practises, or has practised as a midwife, obstetrician, sonographer or another role?

Midwife 🞎 Obstetrician 🞎 Sonographer 🞎 Other (please describe) 🞎

2. Do you currently practise clinically?

Full time 🞎 Part time 🞎 Not currently 🞎

3. How long have (or had) you been in practice (including training)?

≤ 10 years 🞎 11-20 years 🞎 21-30 years 🞎 >31 years 🞎

4. What best describes your practice?

NHS only 🞎 Private only 🞎 Both NHS & private 🞎

5. In which country do you or did you most recently practise? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Please indicate at which gestations, if any, you think asking about fetal movement should be part of routine antenatal care?

|  |  |  |  |
| --- | --- | --- | --- |
| Gestational age(weeks) | All pregnancies | High risk pregnancies only |  Never  |
| 24+0 – 27+6 | 🞎 | 🞎 | 🞎 |
| 28+0 – 30+6 | 🞎 | 🞎 | 🞎 |
| 31+0 - 33+6 | 🞎 | 🞎 | 🞎 |
| 34+0 – 36+6 | 🞎 | 🞎 | 🞎 |
| 37+0 – 40+6 | 🞎 | 🞎 | 🞎 |
| > 41+0 | 🞎 | 🞎 | 🞎 |

Please give reasons for your response:

7. Do you use a kick chart as part of antenatal care?

Yes for all pregnancies 🞎 Yes, for high risk pregnancies 🞎 No 🞎

If yes, please provide reasons why:

If yes, please provide details of the chart you use:

|  |  |
| --- | --- |
| Name or author of chart |  |
| Instructions for using this chart |  |
| Procedure for counting (e.g. all day, for 2 hours) |  |
| When to report reduced fetal movements (e.g. less than *x* movements in *y* hours) |  |

8. Do you routinely provide any other information about RFM as part of antenatal care, such as leaflets or other guidance? If so, what is recommended in your unit? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Please indicate your level of agreement with the following statements: “Asking women to formally count fetal movements using a kick chart ……

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly agree | Agree | Unsure | Disagree | Strongly disagree |
| … is helpful in routine antenatal care for all women | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … helps women to remember to notice movements every day | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … increases maternal-fetal attachment | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| ... increases maternal anxiety | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … assists in detecting fetal growth restriction | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … avoids unnecessary consultations for reduced fetal movements | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … is proven to prevent stillbirth | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … is only useful for women considered to be at high risk of pregnancy complications | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … results in unnecessary intervention | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| … is of no benefit | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |

10. Please indicate what you consider to be reduced fetal movements in the **third trimester** of pregnancy.

|  |  |  |
| --- | --- | --- |
| **Fetal movements** | **Duration** | **Reduced fetal movements** |
| **Yes** | **No** | **Unsure** |
| <3 movements per hour | Over 12 hours | 🞎 | 🞎 | 🞎 |
| < 10 movements total | Over 2 hours | 🞎 | 🞎 | 🞎 |
| < 10 movements total | Over 12 hours | 🞎 | 🞎 | 🞎 |
| <10 movements per 12 hours | Over 2 days | 🞎 | 🞎 | 🞎 |
| Maternal perception of reduced fetal movement | Over 12 hours | 🞎 | 🞎 | 🞎 |
| Maternal perception of reduced fetal movement | Over 24 hours | 🞎 | 🞎 | 🞎 |
| Any maternal perception of reduced fetal movements | Any | 🞎 | 🞎 | 🞎 |
| Maternal perception of reduced fetal movements with recorded data (e.g. kick chart) | - | 🞎 | 🞎 | 🞎 |

Please give reasons for your response:

11. Women in the **third trimester** of pregnancy should report **complete absence** of fetal movements lasting for a period of …

12 hours 🞎 24 hours 🞎 48 hours 🞎 Other 🞎

If other, please state:

12. Are you aware of any clinical practice guidelines within your institution for the management of women with reduced fetal movements?

Yes 🞎 No 🞎 n/a 🞎

If yes, which guidelines are followed:

RCOG 🞎 NHS England Saving Babies Lives Care Bundle 🞎 Other 🞎

13. Which of these interventions, if any, would you perform on women presenting with reduced fetal movements **from 28+0 to 37+6 weeks of gestation**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Management** | **Always** | **Sometimes (dependent on risk status of patient)** | **Never** |
| Give a kick chart | 🞎 | 🞎 | 🞎 |
| Measure symphysis-fundal height | 🞎 | 🞎 | 🞎 |
| CTG | 🞎 | 🞎 | 🞎 |
| Vibro-acoustic stimulation | 🞎 | 🞎 | 🞎 |
| Ultrasound scan for growth | 🞎 | 🞎 | 🞎 |
| Ultrasound biophysical profile | 🞎 | 🞎 | 🞎 |
| Kleihaur-Betke’s test | 🞎 | 🞎 | 🞎 |
| Umbilical artery Doppler | 🞎 | 🞎 | 🞎 |
| Admit to hospital | 🞎 | 🞎 | 🞎 |
| Consider expedited birth | 🞎 | 🞎 | 🞎 |

Please give reasons for your responses:

14. Which of these interventions, if any, would you perform on women presenting with reduced fetal movements **after 37 weeks of gestation**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Management** | **Always** | **Sometimes (dependent on risk status of patient)** | **Never** |
| Give a kick chart | 🞎 | 🞎 | 🞎 |
| Measure symphysis-fundal height | 🞎 | 🞎 | 🞎 |
| CTG | 🞎 | 🞎 | 🞎 |
| Vibro-acoustic stimulation | 🞎 | 🞎 | 🞎 |
| Ultrasound scan for growth | 🞎 | 🞎 | 🞎 |
| Ultrasound biophysical profile | 🞎 | 🞎 | 🞎 |
| Kleihaur-Betke’s test | 🞎 | 🞎 | 🞎 |
| Umbilical artery Doppler | 🞎 | 🞎 | 🞎 |
| Admit to hospital | 🞎 | 🞎 | 🞎 |
| Consider expedited birth | 🞎 | 🞎 | 🞎 |

Please give reasons for your responses:

14. At which gestation(s), if any, would you consider induction or expedited birth for reduced fetal movements in the absence of any other complications?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RFM definition** | **<34 weeks** | **34-36+6 weeks** | **37-40 weeks** | **Over 40 weeks** | **Never** |
| Maternal perception of reduced fetal movements | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| Maternal perception of absent fetal movements | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| Objective evidence of reduced fetal movements | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |
| Objective evidence of absent fetal movements | 🞎 | 🞎 | 🞎 | 🞎 | 🞎 |

15. In general, do you feel that any of the following are significantly increased in women presenting with reduced fetal movements?

|  |  |  |  |
| --- | --- | --- | --- |
| **Condition** | **Yes** | **No** | **Unsure** |
| Maternal anxiety levels | 🞎 | 🞎 | 🞎 |
| Pre-term labour | 🞎 | 🞎 | 🞎 |
| Pre-eclampsia | 🞎 | 🞎 | 🞎 |
| Primigravida | 🞎 | 🞎 | 🞎 |
| Male or female fetal sex | 🞎 | 🞎 | 🞎 |
| Anterior placental site | 🞎 | 🞎 | 🞎 |
| Fetal hypoxia/fetal distress | 🞎 | 🞎 | 🞎 |
| Fetal growth restriction | 🞎 | 🞎 | 🞎 |
| Maternal obesity (BMI >30) | 🞎 | 🞎 | 🞎 |
| Umbilical cord pathology | 🞎 | 🞎 | 🞎 |
| Maternal depression | 🞎 | 🞎 | 🞎 |
| Maternal wish for additional scan | 🞎 | 🞎 | 🞎 |