

Original Article

Maternal knowledge of fetal movements in late pregnancy

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Background: Current evidence suggests that fetal movements are an important indicator of fetal well-being. About a quarter of women who present with decreased fetal movements have adverse perinatal outcomes such as intrauterine growth restriction and stillbirth. There are no New Zealand studies reporting maternal knowledge about fetal movements in late pregnancy.

Aims: To determine what information women in the third trimester of pregnancy receive about fetal movements, both from their maternity caregivers and from other sources.

Methods: A convenience sample of 100 women attending two antenatal clinics in Auckland in November and December 2011 were interviewed by a medical student.

Results: Ninety-seven per cent of women reported that their lead maternity carer (LMC) regularly asked about fetal movements, and 62% recalled receiving information from their LMC about what to expect regarding fetal movements in the last three months of pregnancy. Thirty-three per cent recalled receiving information from their LMC that their baby's movements should increase or stay the same and 20% that their baby's movements may decrease in late pregnancy. Forty per cent were advised to contact their LMC if they had any concerns about their baby's movements, and one-quarter were informed to seek advice if they had fewer than 10 movements in a day.

Conclusions: Our study suggests a proportion of pregnant women in Auckland do not have optimum information about fetal movements. Strategies to enhance maternal knowledge such as a pamphlet about fetal movements may be helpful.

Key words: fetal movement, health knowledge, attitudes, practice, stillbirth, fetal monitoring, consumer health information.

Introduction

Maternal perception of fetal movements is a commonly used and simple means of assessing fetal well-being, as decreased fetal movement (DFM) is a risk factor for several adverse perinatal outcomes.¹⁻⁷ About a quarter of women presenting with DFM have a pregnancy complicated by intrauterine growth restriction, preterm delivery or stillbirth,³ and the presence of DFM is associated with a more than twofold increase in the risk of stillbirth.² DFM is thought to occur as an adaptive response to hypoxia, a result of blood being redistributed away from skeletal muscles to the brain, adrenal glands and heart. Although it is unclear what criteria should be used to define normal fetal movements, there is consensus that regular fetal activity is associated with good pregnancy outcomes, and DFM is associated with poor

outcomes.^{2,3,8} The majority of the limited research suggests that fetal movements do not decrease in late pregnancy,⁹⁻¹¹ although longer periods of inactivity with advancing gestation have been reported.⁹

The information currently provided to pregnant women about fetal movements, from both maternity care providers and consumer sources, is variable.⁵ Although most consumer websites advising about 'baby movements' provide reliable advice about normal fetal activity patterns,¹²⁻¹⁷ some indicate that it is normal for fetal movements to reduce in late pregnancy.^{18,19} It is not surprising that with such conflicting information many women wait over 24 h after experiencing DFM before accessing care, potentially compromising the health of their baby.^{3,4}

Since Grant and colleagues' Lancet publication in 1989, which suggested that kick charts had little beneficial effect on reducing antepartum stillbirth,²⁰ the role of formal fetal movement counting in improving perinatal outcomes has remained controversial.²¹ However, there is increasing evidence of their positive effect and further studies have shown that increasing maternal vigilance of fetal activity has been associated with lower stillbirth rates and reduced delays in accessing health care.^{22,23}

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There are no New Zealand studies reporting maternal knowledge about fetal movements in late pregnancy. We aimed to determine what information women in the third trimester of pregnancy received about fetal movements, both from their maternity caregivers and from other sources.

Materials and Methods

Participant recruitment

Participants were recruited over a summer studentship in Auckland in November and December 2011. In New Zealand, maternity care is provided by lead maternity carers (LMCs) who are contracted through the Ministry of Health. A midwife is the LMC for the majority (78%) of births in New Zealand.²⁴ Women attending one of two large Auckland antenatal clinics were invited to participate in the study. One clinic was in a large primary care midwifery practice in the Counties Manukau District Health Board area and the other was a hospital antenatal clinic at Greenlane Clinical Centre in the Auckland District Health Board. The student attended the weekly antenatal clinics in each location over a 4-week period, and women in the waiting room were invited to participate and complete the questionnaire. Inclusion criteria were gestational age of 28 weeks or more and consent to participate in the study. A convenience sample of 100 pregnant women was used as this was the number that could be interviewed during the summer studentship.

Ethical approval for this study was gained from Northern X Regional Ethics Committee, New Zealand. NTX/11/EXP/222.

Data collection

The questionnaire was administered by a single interviewer (the summer medical student AP) and took approximately 15 min to complete. Participants were asked whether their LMC regularly enquired about their baby's movements, and what advice they had been given by their LMC regarding what to expect with their baby's movements in the last three months of pregnancy. This was coded as 'no information given about strength or frequency of baby's movements', 'baby's movements should increase', 'baby's movements should stay the same', 'baby's movements may decrease' or 'other'. The same question was asked about what information participants had read or heard from other sources (such as antenatal classes, books, the internet, friends and family).

Participants were also asked whether their LMC had advised them to use a kick chart, and if so, how many weeks pregnant they were when they were first asked to use the chart. Finally, participants were asked whether they had received advice regarding when to contact their LMC about their baby's movements, with the following options: 'no advice about when to make contact', 'if I feel fewer than 10 movements in a day', 'if I feel fewer than

10 movements over 2 h when my baby is normally active', 'if I am concerned in any way about the strength or frequency of my baby's movements' or 'other – please state'.

Limited demographic data were collected, including age, ethnicity, parity, marital status, education level and gestational age. Ethnicity was assigned using a system of prioritisation based on the standardised system of ethnicity data collection used by the New Zealand Ministry of Health.²⁵ If more than one ethnicity was identified, they were prioritised in the following order: Maori, Pacific, Indian, Other Asian, Other and New Zealand European. Highest level of education was used as a proxy for socio-economic status as these are highly correlated.²⁶

To minimise bias introduced by the interviewer, standardised questions were used.

Statistical analysis

Data were entered into a Microsoft Excel database. Descriptive analysis was performed using SPSS statistical software (SPSS Inc., version 19.0, Chicago, IL, USA).

Results

One hundred women completed questionnaires. Most participants (81%) had an independent midwife as their LMC. The mean gestational age at interview was 35.0 weeks (Table 1) and 39% of participants were nulliparous.

Information about fetal movements in late pregnancy

Respondents reported that almost all LMCs (97%) regularly asked them about fetal movements at their antenatal visits. Sixty-two per cent of women recalled their LMCs providing them with information about what to expect with their baby's movements in the last three months of pregnancy. Twenty per cent of women reported that their LMCs had advised them that their baby's movements may decrease in the last three months of pregnancy (Table 2). Thirty-three per cent understood from their LMCs that their baby's movements should increase or stay the same. Five women recalled being advised that there 'should be at least ten movements a day' but did not know whether movements should increase, stay the same, or decrease towards term.

Thirty-eight per cent of women had found or received information about fetal movements in late pregnancy from other sources, such as antenatal classes, friends, books and the internet. Twenty-two per cent received information from these other sources that their baby's movements may decrease.

Twenty-five per cent of women did not recall receiving any information regarding fetal movements from their LMC, or from other sources (Table 2). A further 13% reported receiving information from their LMC and from

Table 1 Demographic characteristics of the participants

Gestational age (weeks)	35.0 (3.3)
Maternal age (years)	28 (5.2)
Parity	
0	39
1	31
2	18
≥ 3	12
Ethnicity	
Maori	20
Pacific	33
NZ European	21
Indian	11
Other Asian	10
Other	5
Marital status	
Married	54
De facto	35
Single	11
Lead maternity carer	
Midwife	81
Hospital clinic (midwife or doctor)	18
General practitioner	1
Educational level: university degree	
Yes	32
No	68

Data are mean (SD), or % as appropriate.

Table 2 Information about fetal movements: from lead maternity carer (LMC) and other sources

Information from other sources (#)	Information from LMC (#)				Total
	No information	Increase or stay the same	Decrease	Other	
No information	25	24	6	7	62
Increase or stay the same	4	7	1	1	13
Decrease	7	1	13	1	22
Other	2	1	0	0	3
Total	38	33	20	9	100

other sources that their baby's movements may decrease. In total, 29% reported that they have received information from any source that their baby's movements may decrease.

Management of DFM

Nineteen per cent of women did not recall receiving information about when to seek advice regarding their baby's movements, and a further 5% could not remember what they had been told. Forty per cent stated that their LMC had advised them to make contact if they were

concerned in any way about the strength or frequency of their baby's movements. The most common 'alarm limit' was fewer than ten movements in a day, with 25% of respondents having received this information. Some of these women stated that their LMC had also told them to make contact if they had any concerns. Of the 11% classified as 'other', many had vague responses, such as 'no movement for a few hours' or 'if baby hasn't moved for a couple of days'. Some women also recalled their LMC suggesting that they drink a glass of water, have something to eat or move around to see if this would stimulate their baby's movement and if it did not, then to call their LMC.

Nineteen per cent of respondents had been asked to use a kick chart, starting at a mean gestational age of 24.9 (7.7) weeks.

Discussion

In this survey of women in the third trimester of pregnancy, we found that almost all respondents were asked regularly about fetal movements by their LMC, suggesting that maternal perception of fetal movements is recognised to be an important component of antenatal care. However, over a third of women surveyed reported that they did not recall receiving specific advice about normal fetal activity from their LMC. Of concern, about a quarter of women perceived that it was normal for movements to decrease in late pregnancy.

In 2010, guidelines were published by the Australian and New Zealand Stillbirth Alliance (ANZSA) regarding fetal movements, with the goal that this may lead to more evidence-based care for women experiencing DFM.²⁷ These guidelines are consistent with the Royal College of Obstetricians and Gynaecologists' guidelines in the United Kingdom.²⁸ ANZSA guidelines include giving all pregnant women advice about normal fetal movements, namely that it is normal to experience at least ten movements in 2 h and advising women not to wait until the next day if they notice DFM or absent fetal movements.²⁷ The results from our study suggest that while fetal movements are regularly discussed, many of the pregnant women surveyed did not recall receiving optimal information about normal fetal movements in the third trimester. A significant proportion of women reported being told that fetal movements may decrease in late pregnancy, despite the association between DFM and poor perinatal outcomes.

If a woman is concerned about DFM, the ANZSA guidelines recommend that she lies on her side and counts movements over 2 h, with advice to contact her LMC if fewer than ten movements are felt in that time.²⁷ In contrast, our study found that the most common alarm limit was fewer than 10 movements in a day, which is consistent with the findings of a 2009 survey of obstetric practice in New Zealand and Australia.²⁹ In our study, no woman reported being told to contact her LMC if there were fewer than 10 movements over 2 h at a time when

their baby was normally active, although this is the suggested alarm limit in the ANZSA guideline. Reassuringly, the most popular response was to contact the LMC if there was any concern about fetal movements, which is in keeping with the ANZSA guideline that states 'maternal concern of DFM overrides any definition of DFM based on numbers of fetal movements'.²⁷ Maternal concern is important because of the wide variability in movements between fetuses, meaning alarm limits tend to be very poorly sensitive and specific.¹¹

The findings from our study suggest that some Auckland pregnant women do not recall receiving the latest evidence-based advice about fetal movements. This is concerning in light of recent research from Norway highlighting the importance of information provision. The Norwegian study introduced a brochure providing evidence-based information about fetal movements to over 3000 pregnant women and also provided some information to clinicians.²² Following this intervention, the stillbirth rate almost halved, and women were more likely to present within 24 h of experiencing DFM.²² Improved awareness did not appear to increase maternal anxiety or hospital admissions.^{22,30,31} In this Norwegian study, the beneficial effect of increased education about fetal movement had its most pronounced effect in nulliparous women.³⁰ Unfortunately, we were underpowered in our study to assess whether knowledge differed between nulliparous and parous women.

Similarly in the large Grant trial, whilst no difference was found in stillbirth rate between women with 'count to ten' kick charts and controls, there was an overall reduction in late stillbirth during the study period, which again suggests that increased awareness of fetal movements is associated with improved outcomes.²⁰ As research to date has not conclusively shown the effectiveness of kick charts in pregnancy,^{20,21,23} this may explain why only a small proportion of women in our study had been asked to use one.

Two international studies found that approximately half of women with DFM waited more than 24 h before accessing care.^{3,4} The Auckland Stillbirth Study found that 43% of those who experienced a stillbirth presented to health services with DFM, with the vast majority being diagnosed with fetal death at that time.² Improved information, such as the educational leaflet recently published by ANZSA (www.stillbirthalliance.org) may mean more fetuses with DFM are alive at presentation to health services, and thus intervention could be life-saving.

Limitations

Our sample size of 100 was limited by the time available for the summer studentship. Eighty-one per cent of our sample had their maternity care provided by a self-employed midwife, which is similar to national data.²⁴

However, our findings may not be representative of advice and knowledge in New Zealand as a whole. In particular, we did not survey women attending private obstetric practices. We chose to target women from lower socio-economic backgrounds, as these women have higher rates of stillbirth.³²

It is possible that some respondents may not have correctly reported the information they received from their LMCs, as pregnant women receive a vast amount of information and advice. Additionally, some women could not remember the exact advice that they had been given. What women remember from the information they receive is, however, important and this highlights the fact that any intervention or information provided needs to be simple and easily remembered.

Further research using a larger sample and including private obstetricians may be useful to confirm or refute our findings.

Conclusion

Approximately half of the women in this study were not aware of optimum information about fetal movements. These findings suggest that strategies to enhance the knowledge of pregnant women may assist in earlier recognition of DFM and in the longer term lead to an improvement in perinatal outcomes.

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