

STANBUL 2009

Fetal Movements in IUGR

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3-4 December 2009 - Istanbul

STANBUL 2009

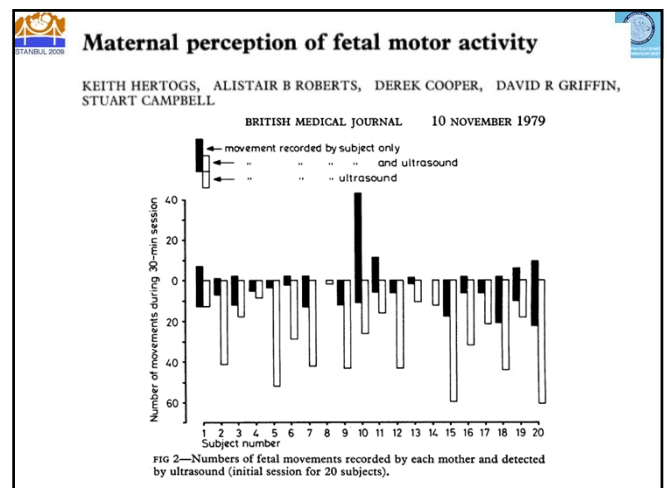
Reduced fetal movements - Background

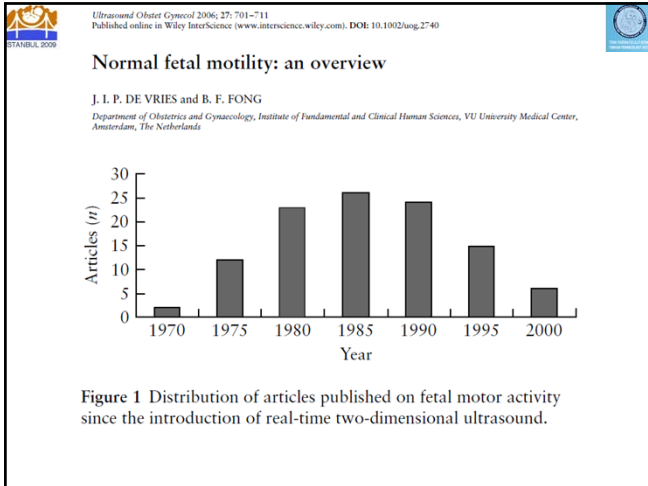
- Maternal perception of fetal movements is widely used as a marker of fetal well-being.
- A reduction in fetal movements is associated with fetal hypoxia, IUGR and increased incidence of stillbirth.
- Movement count has been proposed as a screening tool for IUGR.

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Reduced fetal movements - Background

- No alarm limits - Variation in methodology and definitions.
- A wide range of non evidence based advice.
- All definitions \leq Maternal subjective perception.
- Maternal awareness = decreased perinatal mortality.







- ## Problems
- Maternal reporting of decreased fetal movements is a frequent reason for unplanned health consultations through the third trimester (5-15%)
 - Movement count has a risk to increase laboratory and obstetric interventions and iatrogenic injuries.
 - NST and ultrasound examination were the most useful tools in decreased fetal movements but controlled trials of management in IUGR are lacking.



- ## Reduced Movements - IUGR
- In a retrospective case notes-based analysis of patients presenting with reduced fetal movements a total of 29% of infants had been found with a birth weight of less than the 10th centile.
 - Heazell AE et al. What investigation is appropriate following maternal perception of reduced fetal movements? J Obstet Gynaecol, 2005

- ## Reduced Movements - Hypoxemia
- With worsening hypoxemia fetal breathing movement ceases in IUGR cases.
 - Gross body movements and tone decrease and are finally lost when acidemia develops.
 - Ribbert LS, et al. Changes with time in fetal heart rate variation, movement incidences and haemodynamics in intrauterine growth retarded fetuses: a longitudinal approach to the assessment of fetal well being. Early Hum Dev, 1993



Doppler - BPS

- In a large cohort of IUGR fetuses, Doppler and BPS results do not show a consistent relationship with each other.
- It is also confirmed that cardiovascular deterioration precedes an abnormal BPS.
- *Baschat AA et al, Doppler and biophysical assessment in growth restricted fetuses: distribution of test results. Ultrasound Obstet Gynecol 2006*



Doppler - BPS

- Doppler and biophysical deterioration can occur independently of each other.
- Application of BPS to a population of IUGR fetuses that has been preselected by Doppler examination can yield good results.
- These are complementary antenatal modalities.



Fetal movements - Perception

- The perception of pressure against body-wall structures, reflects gross fetal or limb movement.
- During ultrasound monitoring the proportion of movements perceived by the mother ranges from 37% to 88%.
- *Friøen JF et al. Management of decreased fetal movements. Seminars in Perinatology 2008*



Maximum inactivity

- The maximum period of inactivity is 45 minutes after 30th week of pregnancy in a normal fetus,
- *De Vries JJP, Fong BF. Normal fetal motility: an overview. Ultrasound Obstet Gynecol, 2006*



Fetal movements - Influencing factors

- Maternal and fetal position
- Activity, exercise
- Anxiety, stress
- Blood glucose
- Smoking
- Placental localization
- Obesity
- Gestational age



Fetal Movement Count

- 10 movements / 2 hours
- Others



"Count to ten" method - RCT

- The women needed 162 minutes to count ten movements versus the average of 20 minutes reported in focused counting.
- *Moore TR, Piacquadio K: A prospective evaluation of fetal movement screening to reduce the incidence of antepartum fetal death. Am J Obstet Gynecol 1989*



No benefit - Multicenter Trial

- No benefit of "Kick Chart" for all pregnancies versus only for risk pregnancies !
- While no difference was shown in the stillbirth rate across the study groups, the overall late-gestation stillbirth rate fell during the study period from 4/1000 to 2.8/1000.
- Contamination between groups and hospitals !!!
- *Grant A et al. Routine formal fetal movement counting and risk of antepartum late death in normally formed singletons. Lancet, 1989*



Guidelines

- NST
- USG
 - Fetal movements
 - Amniotic fluid volume
 - Fetal anatomy
 - Growth

Guidelines



- A mother expressing decreased fetal movement had to be examined within 2 hours if absence of FM was suspected.

4D

- By the use of 4D ultrasound, a correlation is found between normal and IUGR fetuses in the third trimester in:
 - hand to head
 - hand to face
 - head retroflexion

Andonotopo W et Kurjak A. The assessment of fetal behavior of growth restricted fetuses by 4D sonography. J Perinat Med, 2006

Mangesi L, Hofmeyr GJ.
 Fetal movement counting for assessment of fetal wellbeing.
Cochrane Database of Systematic Reviews 2007
 Issue 1. Art. No.: CD004909. DOI: 10.1002/14651858.CD004909.pub2

- This review does not provide enough evidence to influence practice.
- In particular, no trials compared fetal movement counting with no fetal movement counting.
- Robust research is needed in this area.

Lalor JG, Fawole B, Alfircvic Z, Devane D.
Biophysical profile for fetal assessment in high risk pregnancies.
Cochrane Database of Systematic Reviews 2008
 Issue 1. Art. No.: CD000038. DOI: 10.1002/14651858.CD000038.pub2.

- Comparison of BPS (or MBPS) with conventional monitoring (CTG only) on pregnancy outcome in high-risk pregnancies.
- Five trials - 2974 women with pregnancies with a high risk.
- No difference in babies that died, nor with low Apgar.
- Significant increase in induction and caesarean section.
- There is insufficient evidence from randomised trials to support the use of BPS as a test of fetal wellbeing in high-risk pregnancies.

Grivell RM, Wong L, Bhatia V.
Regimens of fetal surveillance for impaired fetal growth.
Cochrane Database of Systematic Reviews 2009
 Issue 1. Art. No.: CD007113. DOI: 10.1002/14651858.CD007113.pub2.

- There is limited evidence from randomised controlled trials to inform best practice for fetal surveillance regimens when caring for women with pregnancies affected by impaired fetal growth.
- More studies are needed to evaluate the effects of currently used fetal surveillance regimens in impaired fetal growth.

Reduction of Late Stillbirth with the Introduction of Fetal Movement Information and Guidelines - A Clinical Quality Improvement
 Tveit JV et al, 2009 - Medscape - Norway

- All obstetricians, general practitioners, community midwives, and others contributing to antenatal care were informed in writing about the ongoing intervention.
- General information about fetal activity, recommendations for maternal care-seeking, several rules of thumb for recognizing DFM.

GET TO KNOW YOUR BABY!

WHAT DO THE KICKS SAY ABOUT WELL-BEING?

THAT'S WHY WE COUNT KICKS!

When it kicks in the womb - what does this mean?

WHAT IS YOUR BABY DOING IN THERE?

SOMETIMES IT'S JUST CALM.

KICKS COUNT

How much should the baby kick - and what if the number of kicks declines?

When it kicks in the womb - what does this mean?

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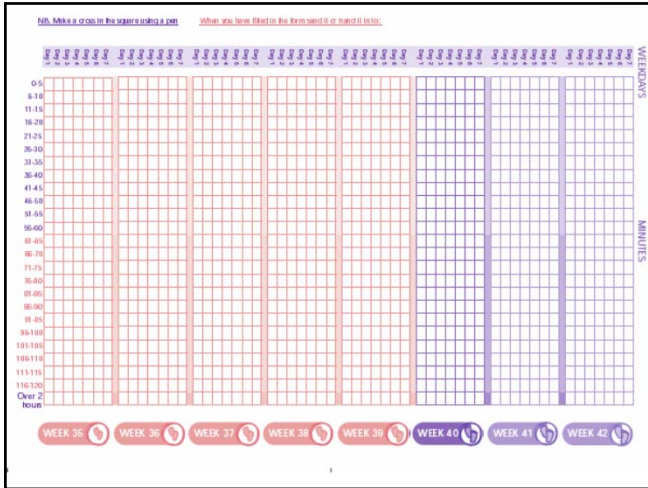
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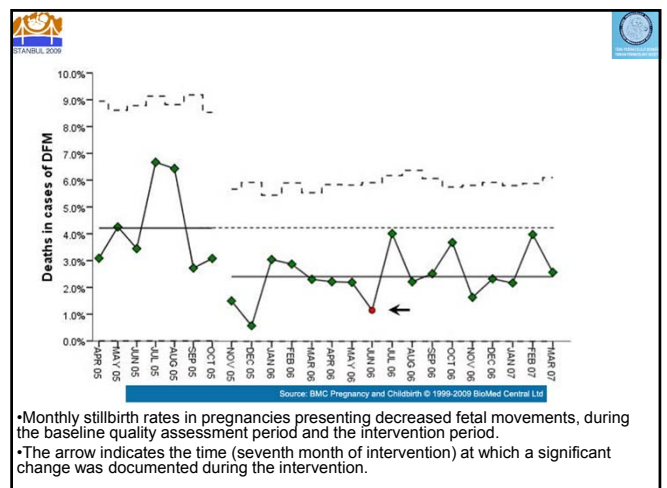




Alarms

- 1) "Never to wait to the next day if the baby did not kick one day",
- 2) "If the baby kicked less and less in the course of a day/days",
- 3) "If you felt less than ten FM in 2 hours at a time of the day when the baby was usually active, and you perceived this as a reduction, call..."

Findings



- Reports of DFM did not increase during the intervention (6.3% vs 6.6%),
- The stillbirth rate among women with DFM fell during the intervention: 4.2% vs 2.4%,
- No increase in the rates of preterm births, fetal growth restriction, transfers to neonatal care or severe neonatal depression.





NST – BPS - Doppler

- Ultrasound scanning was the source of information in 86.2% of cases where abnormalities were detected.
- Umbilical artery Doppler examination failed to add significant information among 3014 cases of DFM.
- *Frøen JF et al.: Management of decreased fetal movements. Seminars in Perinatology 2008.*



- Including clinical examination, the use of NST and ultrasound, without the use of Doppler, stillbirth rates could be decreased while additional follow up visits and admissions for induction were reduced.

Tveit JV et al, 2009 - Medscape - Norway



Fetal movements - Summary

- It is thought that if the oxygen supply to the baby through the placenta is insufficient, the baby responds by moving less often.
- If the mother counts her babies' movements each day, she may be able to identify a decrease in her baby's normal movement patterns.



Fetal movements - Summary

- Recording of fetal movements by the mother is a simple, inexpensive and available method of fetal surveillance without the need of direct medical survey.
- If the mother informs caregivers of decreased FM, one can do additional tests and some babies can be prevented from dying before birth.



Fetal movements - Summary

- However, sometimes FM-counting tests can cause considerable anxiety and may not be easy for some women especially when they are busy at work or caring for other small children.



To Count or Not?

- While the ideal number of fetal movements to be counted or time to spend has not been well defined, perception of 10 distinct movements in a period of up to 2 hours is considered reassuring.



To Count or Not?

- There is no evidence that formal movement count with their fixed alarm limits are superior to maternal common sense,
- No evidence to support the introduction of such counting in any total population,
- No rationale to perform trials using the existing alarm limits of fetal movement count.

Conclusion

- The introduction of the examination of at least one specific movement pattern, (i.e. general movement) into routine care can be advocated.
- Decreased fetal movement needs further evaluation with combined modalities (ultrasound, BPS, Doppler) especially in IUGR pregnancies.



Conclusion

- A "gold standard" is not yet defined.
- Education and cooperation of the patient with individually adjusted monitoring without fixed levels, and alertness of the medical team may improve the test results.