

Case Report

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Decreased Fetal Movements are an Important Red Flag in Second Half of Pregnancy: A Case Report of Baby Saved by Mother's Attention to Fetal Movements

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Abstract

Stillbirth affects over 2,500 families in Australia, New Zealand and over 2.64 million families worldwide annually. Stillbirths are often preceded by maternal perception of decreased fetal movement (DFM). DFM is also strongly linked to adverse perinatal outcomes such as neurodevelopmental disability, infection, fetal to maternal haemorrhage (FMH), emergency delivery, umbilical cord complications, small for gestational age (SGA) and fetal growth restriction (FGR /IUGR). Decreased fetal movements for some women may be associated with placental dysfunction, which could lead to fetal growth restriction and/or stillbirth. While evidence is still emerging in this area, some studies indicate that a reduction in stillbirth rates may be achieved by increasing maternal, clinician and community awareness about the importance of DFM. Fetal movements are an important simple maker of fetal wellbeing, while reduced fetal movements can be the early symptom of fetal compromise and failure to respond by a mother or maternity provider might lead to intrauterine fetal death (IUFD). Fetal movement counting (Fetal Kicks monitoring) is very controversial, maternal anxiety has been highlighted as a big issue in those who follow fetal kick counting advice. The value of maternal fetal movements (FM) monitoring has been assessed in a number of studies of pregnant women. There are conflicting results with most showing no overall reduction in perinatal losses even when fetal movement monitoring has been recommended. Fetuses that are experiencing sub acute and slow progressing fetal compromise can be saved if mothers detect reduced fetal activity and present to their midwife or Obstetrician.

Keywords: Fetal movements, Fetal kick monitoring, Fetal compromise, Stillbirth (IUFD)

Maternal Perception of Fetal Movement and Adverse Events

Maternal perception of fetal movement has long been used as an indicator of fetal wellbeing and vitality. The quality and timing of fetal movements reflects neurobehavioral development and maturation of the fetus, and follows a general pattern with advancing gestation. Maternal perception of fetal movement tends

to commence from 16 to 20 weeks gestation, with these first movements described as a "flutter", "butterflies" or "bubbles". As pregnancy progresses, description of movements changes to reflect increasing strength, more complex limb and trunk movements and greater frequency. In a qualitative study of 40 women within 2 weeks of delivery of uncomplicated pregnancies, 39 of the women described the fetal movements at this stage as "strong and powerful", and half described the fetal

movements as “large” [1].

Studies conducted on the correlation between maternal perception of fetal movements and fetal movements seen on ultrasound scan demonstrated large variations, with correlation rates between maternal perception and actual fetal movement ranging from 16-90%. This variation may be related to a number of factors, including fetal size, specific movement patterns of the baby, gestational age, amniotic fluid volume, medications, fetal sleep state, anterior placentation, smoking and parity. Whilst the type of fetal movements may change as pregnancy advances in the third trimester, evidence does not support that the number of fetal movements decreases as pregnancy advances or prior to the onset of labour [2].

Other considerations that complicate the interpretation of fetal health based on the number of fetal movements are the limited understanding of patterns of fetal activity during “sleep” and active cycles, and the changes in the type of movements as pregnancy advances. Fetal movements are usually absent during fetal “sleep” cycles. Fetal “sleep” cycles occur regularly throughout the day and night and usually last 20 to 40 minutes and rarely exceeding 90 minutes in a healthy fetus. It is important to note that this information should be shared with partners, family and friends so that they too can understand the importance of fetal movements [1-3].

Maternal perception of a gradual diminishment of fetal activity can indicate pregnancies at increased risk of adverse outcomes. Studies have reported associations between, DFM and low birth weight, oligohydramnios, preterm birth, threatened preterm labour, congenital malformations and chromosomal abnormalities, fetal to maternal haemorrhage, perinatal brain injuries and disturbed neurodevelopment, intrauterine infections, low Apgar scores and acidaemia, hypoglycaemia, umbilical cord complications and placental insufficiency, emergency delivery, induction of labour and Caesarean section, stillbirths and neonatal deaths.

Fetal growth restriction appears to be a major factor contributing to the increased risk of adverse outcomes in these pregnancies. A case-control study from the UK reported that IUGR was present in 11% of women with DFM compared with 0% in the control group, suggesting that persistent DFM may alert clinicians to the presence of IUGR. A case-control study of 18,000 births across 6 maternity hospitals in Queensland, Australia found that of pregnant women in the third trimester who reported decreased fetal movement, 16% of these had a baby with

IUGR [4].

DFM is a common cause for maternal concern, with 40% of pregnant women overall expressing concern about DFM one or more times during pregnancy and 4-16% of women contacting their health care provider because of concern during the third trimester. Even in pregnancies that are initially deemed as low risk, DFM is associated with the risk of adverse perinatal outcome, including fetal growth restriction (FGR), preterm birth and stillbirth [4].

Both Australia and New Zealand report fetal deaths from 20 weeks (or weight of ≥ 400 grams if gestation unknown), and neonatal deaths up to 28 days after birth. In Australia, this is reported as a perinatal mortality rate and in New Zealand it is reported as a perinatal related mortality rate.

Across various studies, the wide variation in the reported contribution of unexplained stillbirths from 15% to 71% has been attributed to varying classification systems used, thoroughness of the investigation of deaths and the various definitions of stillbirth. The large proportion of unexplained antepartum stillbirths is a major barrier to further reduction of stillbirth and perinatal mortality rates. The majority of these unexplained deaths occur in late gestation in apparently healthy pregnancies. Many of these babies are, however, found to be growth-restricted after birth indicating potential for the prevention of some of these deaths if antenatal detection and appropriate intervention had been achieved [4].

Clinical risk factors do not reliably predict the likelihood of massive fetal to maternal haemorrhage and DFM may be the only history suggesting this possibility. A retrospective analysis of clinical data from a multi-hospital health care system in the U.S. found that decreased or absent fetal movement was reported by pregnant women in 54% of FMH cases and was the most common presenting sign. An earlier review had found decreased or absent fetal movement reported as the presenting symptom of 27% of all FMH cases published in the medical literature to 1997 [1].

A sinusoidal FHR pattern is the classically described CTG sign indicating severe fetal anaemia, however, this is not present in all cases.

Case report

A case report of mother's whose attention to reduced

fetal movements saved the life of a severely anaemic fetus. "Maternal attention to change of fetal kicks patterns, timely presentation which helped expedite delivery and saved a baby".

A 34 years old, Gravida3, Para 2 who had un-eventful two previous spontaneous vaginal births (SVB), presented with history of reduced fetal movements at a Gestational age 38.2 weeks. This index pregnancy had progressed well to date save for iron deficiency anemia, which had already been corrected by an earlier iron infusion. She presented at level two, district hospital (4 Tier classification).

She presented with a two days history of reduced fetal movements (Albeit delayed presentation). On admission she reported only five fetal movements all day. She gave a history of having flu like fever about 2 days prior to presentation. Temperature recorded on admission was normal.

She had no vaginal bleeding or fluid loss, no history of trauma. No labour pains or abdominal pains. Further enquiry yielded no history of travel and no family member with fever or unwell. No diarrhoea, no vomiting and no urinary symptoms. She did not smoke nor use recreational drugs or non-prescription medication.

Antenatal screening records noted a low risk first trimester trisomy screen. Routine bloods screen at booking were normal, maternal blood group B Rhesus Positive. Moderate iron deficiency was detected at 28 weeks screen; Patient had been treated with iron infusion with good hemoglobin improvement at 36 weeks bloods. Glucose tolerance test and GBS screen swab was negative.

Patient had attended all of the routine antenatal reviews and symphysio-fundal height measurements were consistent with gestational age. There were no fetal growth issues. On examination by duty midwife, she was found to be haemodynamically stable, fetal heart audible by Doppler fetoscope. The uterus was soft, non-tender and height of fundus appropriate for 38 weeks gestation. The fetus was longitudinal in cephalic presentation. The same findings were confirmed by obstetrician follow up examination.

Continuous Electronic Fetal monitoring (CEFM) was initiated by the duty midwife as indicated for a complaint of reduced fetal movements (Figure 1).



Figure 1: Beginning of CTG

The CTG was described as Abnormal, non-reactive and sinister CTG ? Pseudo sinusoidal / intermittent sinusoid segments. Decision was to secure IV access and initial bloods for FBC, group & hold, Kleihauer (FMH) test and extra serum sample for add on tests were collected. Intravenous fluid initiated and Duty GP obstetrician was called to review (Figures 2 and 3).

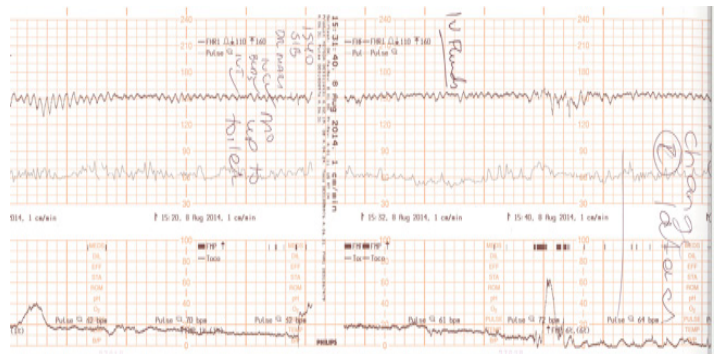


Figure 2: CTG block 2

Comment: Non reactive and query Sinister CTG, Trial of external fetal stimulation Vibroacoustic stimulation (VAS) plus vaginal exam and FSST did not elicit accelerations and cervix was closed and unfavorable.

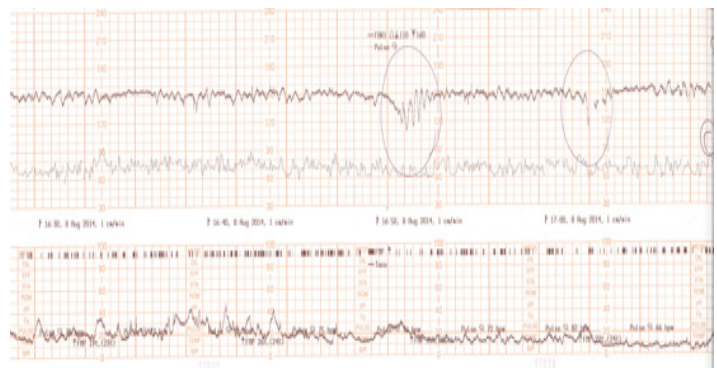


Figure 3: CTG block 3

Comment – "Non reactive non stress CTG and reduced

fetal movements = Compromised fetus

Decision - Preparations for Category 2 LUSCS- term fetus with abnormal CTG, unfavorable cervix

Consent Process

Explanation to the patient about risks to baby with reduced movements and abnormal CTG and the need for an emergency delivery of the baby if CTG remained non-reassuring. Patient's partner had arrive after being called to come in and be part of decision making. Consent signed and preparations for LUSCS all in place and mean while CEFM continued.

This case presented on a day when there was no on site sonographer hence no Doppler studies were carried out and considering the pregnancy was term the merit for delivering baby was stronger than imaging. The cervix was unfavorable and labour induction was deemed likely to worsen the fetal compromise already suspected on the non-stress CTG. A team decision with the involvement of the couple (Patient and partner), a fellow GP obstetrician and clinical managers of the hospital.

Theatre staff and duty GP anaesthetist were already on alert and waiting in theatre after being called in for Category 2 caesarean section for reduced fetal movements with red flags (Figure 4).

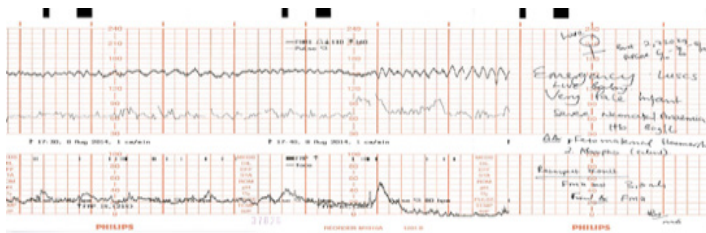


Figure 4: Block 4 CTG

Out come as below

Outcome (Emergency LUSCS)

Routine JC entry and transverse LUS incision was performed under spinal anaesthesia.

Liquor was clear and Live female neonate, "Very pale on extraction from uterus"

Baby was handed to resuscitation team of Midwife, GP ED and support from the GP Anaesthetist.

Placenta removed by CCT – discovered 10 cm x 5 cm retro-placental clot and corresponding depression on the placental maternal surface.

Rest of operation was uneventful and estimated blood loss was 650 ml.

Neonatal care

In Theatre: Neonate was handed to resuscitation Team (level 2 GP, Midwife and Anesthetic GP)

HR >100, good respiratory effort, but baby was very pale and floppy

Cord gases test (Venous only) – PH 7.18, Lactate 7.5 and HB 30 g/L

Neonatal resuscitation and UVC inserted and blood collected then normal saline 30 ml bolus given.

Baby improved and was breathing spontaneous, HR >100 but still very pale.

Birth weight was 2720 g. APGAR – 6/10 at 1' and 7/10 at 5' and 8/10 at 10'.

Baby was moved from theatre to Level 1 NNU within same hospital.

Level 2, Neonatal care in remote sites: Telemedicine, (GP care with telephone help from regional Paediatrician = virtual level 2 care).

Procedures and tests: UVC blood sample HB 30 g/L, Hematocrit 0.09%.

Blood transfusion: An agreed decision was to transfuse baby, with O-Neg packed cells calculated 20 ml per Kilogram of birth weight over 4 hours. Frusemide 1 mg was given at 2 hours post initiation of infusion. Baby tolerated transfusion well and was maintaining stable vital observations.

Check HB after 3 hrs post transfusion was 95 g/L, Hct 0.29 and baby was stable and managed to room in with mother.

Cord Blood group Was A- positive and Negative coombs

Second transfusion was scheduled after 48 hrs to allow

ordering of A-positive neonatal size packs and group specific blood. The baby tolerated transfusion well and the discharge HB was 135 g/L and hematocrit 0.40

Post op Working diagnosis

- Severe spontaneous Feto-maternal haemorrhage.
- Rule out Other causes of anaemia – Parvovirus, Abruptio, iron deficiency, ABO alloimmunization, and rhesus Alloimmunization.

Differential Diagnosis Puzzle

Maternal blood collected prior to LUSCS for group and hold was assessed for Feto-maternal haemorrhage using Kleihauer-Betke test and confirmed that there was 3,3 ml fetal cell in maternal blood. The placenta histology reported two chorangioma lesions noted on the maternal side surface of the placental, within the depression noted on placenta at delivery.

Diagnostic puzzle: “Our case had severe anaemia but the WBC and Platelet count remained in normal ranges, which prompted a list of differential diagnoses like FMH, Abruptio, Vasa previa, Parvo virus infection, Blackfan and Diamond anaemia”.

Feto-maternal haemorrhage: Quantification of the amount of FMH in ABO incompatible maternal and fetal blood is affected by the fast destruction of fetal red cells by the maternal antibodies already present in her plasma. This makes K-B-test diagnostic but not accurate on quantification of total FMH in ABO incompatible.

Insignificant haemorrhage of fetal blood into the maternal circulation is common and usually unrecognised but when significant (i.e. acute large volume FMH, recurrent small/moderate FMH or chronic small volume loss over time) it can lead to fetal compromise and perinatal death.

Massive fetal to maternal haemorrhage (FMH) (varying from >50 ml to >150 ml) has been demonstrated in approximately 4% of stillbirths and in 0.04% of neonatal deaths. Moderate to severe FMH occurs in around 0.3% of all live births. However, there is ambiguity over the definition of a clinically relevant volume of haemorrhage, as the rate of blood loss, chronicity of the bleed and gestational age of the fetus may also influence the risk of adverse perinatal outcome.

Parvovirus infection remained a contending

differential, hence maternal and fetal PCR test were requested and they were reported positive. This would fit well with anaemia with preserved WBC and platelet count, but the placenta histology had been reported and no viral inclusion bodies noted. We carried out retrospective antibody screening of maternal 36 weeks blood serum held in the lab. The test was negative for Parvovirus Ig G & Ig M. This would support a case of primary Parvovirus infection between 36 and 38 weeks. This then brought a dilemma as to what exactly was the primary cause of the severe neonatal anaemia. There is a possibility of a Parvovirus infected fetus, which also suffered Fetomaternal haemorrhage.

Up to date [1] information on Feto-maternal haemorrhage quotes reduced or absent fetal movements as the commonest symptom. Some non-specific symptoms (Fever, chills) consistent with transfusion reaction can be elicited from history. “Our patient (mother) had some flu like fever 2 days before presentation, which also coincided with period of reduced fetal movements”.

The baby had severe anaemia with predominantly reduced RBC while WBC and platelets were within normal range. There were no signs of decompensated cardiovascular system, no features of CCF or hydrops on the baby, which pointed to likely recent event causing the anemia.

This baby was reviewed at two weeks, six weeks and was reported health and clinically stable.

Baby was breastfeeding well and gained weight at appropriate rate. FBC at two and six weeks showed normal retic count and hemoglobin improvement.

Diamond and Blackfan anaemia was unlikely as there was no family history and the ancestry of parents (Fiji and Australian).

Discussion

Most guidelines have good protocols on management of a woman presenting with reduced fetal movements. The contentious issue is on what we teach antenatal women about fetal movements.

RCOG & RANZCOG [2-4] discourage routine fetal movement monitoring in low risk pregnancy but most clinicians ask about fetal movements during routine antenatal reviews and once a women reports reduced movements a comprehensive algorithm has to be

followed, CTG and USS for fetal wellbeing (AFI, SD ratio, MCA PI).

The ACOG supports and encourages pregnant mothers to count and have a baseline of their baby movements so that when there is deviation, mothers can alert their caregivers. "The kick count is an easy, non-invasive test that you can do at home to check your baby's wellbeing. The idea is to be sure he or she is moving around enough. There are numerous ways to count your baby's movements and numerous opinions on how many movements you are looking for within a certain amount of time" [5].

The American College of Obstetricians and Gynecologists (ACOG) recommends that you time how long it takes you to feel 10 kicks, flutters, swishes or rolls. Ideally, you want to feel at least 10 movements within 2 hours. Most likely you will feel 10 movements in much less time. Though strongly recommended for high risk pregnancies, counting fetal movements beginning at 24 weeks may be beneficial for all pregnancies" [5].

This case reinforces the importance of teaching our antenatal patients to know their baby's usual pattern of movements and the importance of early presentation to hospital. The ACOG advice is for patient to choose a two-hour period after meal to count fetal movement, commonly called "Kicks" on a kick chart, with aim to register at least 10 kick per two hour period. This is a screening tool and is not diagnostic. This is controversial and maternal anxiety increases. The RANZCOG and RCOG do not subscribe to kick counting and discourages routine teaching of kick monitoring [2,4].

Guidelines on how to manage a mother who reports reduced fetal movements appear universal with most college guidelines advising hand held Doppler, CTG and USS fetal checks depending on gestational age and duration or persistence of reduced fetal movements [2,6,7].

The current evidence based guidelines and recommendations are against the use of fetal "kicks" monitoring as routine antenatal practice but ironically recommend that all women with reduced fetal movements should contact their midwife or Obstetrician. The guidelines advise mandatory CTG and if <32 weeks or ongoing concern, ultrasound scan assessment for fetal wellbeing [2,4,6].

The dilemma comes in what we should tell women during antenatal classes about fetal movements and their importance in possibly saving some babies.

There is need to standardize of the message and counting method and give similar advice to all women whether high risk or low risk and it should be a WHO good clinical practice recommendation. The main message to women should help them detect derangement from usual for their baby (deviation from baby's usual trend). The debate of evidence based and Good practice is a perennial topical issue more so when a mother presents with no fetal heart beat and she recalls the reduction in fetal movements four days prior to day of presentation.

Conclusion

This case highlights and supports the advocates for fetal kick monitoring for all pregnant women from 24weeks. The case report was a low risk pregnancy, which ended in a significant fetal compromise. The attention to fetal movement routine by the mother prompted the review by the on call obstetric team; emergency obstetric decision and emergency delivery saved the baby.

Fetal movement monitoring should be part of routine antenatal teaching of all pregnant women after 24 weeks and clear literature should be developed and standard counting method will improve maternal awareness and would reduce anxiety. We might experience a surge of presentations to maternal fetal monitoring units (MAFAU) and antenatal CTG assessments and reassurance counseling sessions.

"IUFD at term is devastating to all, the family, midwifery, obstetric team and the perinatal assessment team. The cost of running MAFAU, CTG and counseling is less than the psychological pain of a term IUFD (stillbirth), investigations and the psychological trauma that is associated with a term / near term fetal loss".

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