Review Article

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# Reduced Fetal Movements: Review

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**Abstract**

There are only two properties that can determine if an object is alive: metabolism and motion. Movement is the most convincing and visible indicator of life. Since fetal movement is a sign of fetal health, decreased movement is a cause of concern. Maternal perception of fetal movement is an inexpensive and non-invasive method of assessment of fetal well-being. Maternal perception of reduced fetal movements (RFM) is associated with adverse pregnancy outcomes including fetal growth restrictions, oligohydramnios, still birth. Decreased fetal movements are regarded as a marker for suboptimal intrauterine conditions. A wide range of investigations are performed for the complaint of reduced fetal movements after clinical examination. In low resource settings, maternal perception of reduced fetal movement plays vital role in early detection of fetal jeopardy. This will facilitate timely intervention and prevent adverse perinatal outcome.

**Keywords:** Reduced Fetal Movement; Fetal well-being; Stillbirth; Intervention.

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## Introduction

Antepartum fetal surveillance is the fetal assessment of fetal well-being in utero before the onset of labour. It helps in early detection of foetuses at risk so that timely management can prevent further deterioration, thereby reducing perinatal morbidity and mortality. The goal of antepartum fetal surveillance is to prevent fetal death (ACOG 1999).[1]

There are only two properties that can determine if an object is alive: Metabolism and motion (McKay, 2004). Movement in all forms -microscopic or macroscopic is the most convincing and visible indicator of life. Since foetal movement is a sign of fetal health, decreased movement is a cause of concern. The fetus responds to chronic hypoxia by conserving energy and reduction in fetal movements is adaptive mechanism to reduce oxygen consumption.[2]

Actual frequency of movements and mother's ability to perceive fetal movements are influenced by various factors:

- Maternal position,
- activity and exercise,
- anxiety,
- stress,
- blood sugar,
- smoking,
- placenta localization, and
- obesity.[3]

Several studies have presented guidelines including non-stress test (NST),

ultrasound examination and Doppler.[3]

Maternal perception of fetal activity is an accepted marker of fetal well-being. Conversely, maternal perception of changes in activity can indicate fetal compromise; the most commonly reported change is a reductionin fetal movement.[4,5] Maternal perception of reduced fetal movements (RFM) is associated with adverse pregnancy outcomes including

- fetal growth restriction,[6]
- oligohydramnios[7] and
- stillbirth.[6]

Any significant deviation from a mother's usual pattern of fetal movement is a risk factor for stillbirth.[8] Counselling to pregnant women with reduced fetal movements is important. She is worried about health of her baby. So it is essential to give her clear information about these symptoms.

**Still Birth**

Most stillbirths happen without fetal abnormality or pre-existing risk factors for stillbirth. Large proportion of stillbirths are possibly preventable.[9] The link between RFM and stillbirth (or the causes of stillbirth) is clear. 30–55% of women whose pregnancies end in stillbirth, experience RFM in the preceding week.[10,11] RFM is a symptom of inevitable fetal death or whether it can be used as an alert to prompt action and improve outcome is unclear. Crucially, maternal perception of RFM can only improve outcome if action is taken.[12]

**Table 1:** Actual Reduced Fetal Movements

| **Fetal causes** | **Fetal sleep, congenital fetal malformation, fetalanemia, hydrops** |
|---|---|
| Maternal causes | Polyhydramnios,<br>increased maternal weight,<br>A busy mother who is not concentrating on fetal activity,<br>maternal anaemia,<br>metabolic disorders,<br>hypothyroidism |
| Others | Smoking,<br>Anterior placental localization,<br>Administration of corticosteroids for enhancement of fetal lung maturity,<br>Maternal sedating drugs that cross the placenta (alcohol, benzodiazepines, barbiturates, methadone, narcotics),<br>Acute or chronic fetomaternal haemorrhage<br>Acute or chronic hypoxia from placental insufficiency<br>leading to:<br>• reduced amniotic fluid volume (oligohydramnios)<br>• fetal growth restriction[21] |

Gradual decline of fetal movements during the third trimester is due to

1. improved fetal coordination
2. reduced amniotic fluid volume,
3. increased fetal size.[14]

Decreased fetal movements are regarded as a marker for suboptimal intrauterine conditions.[13]

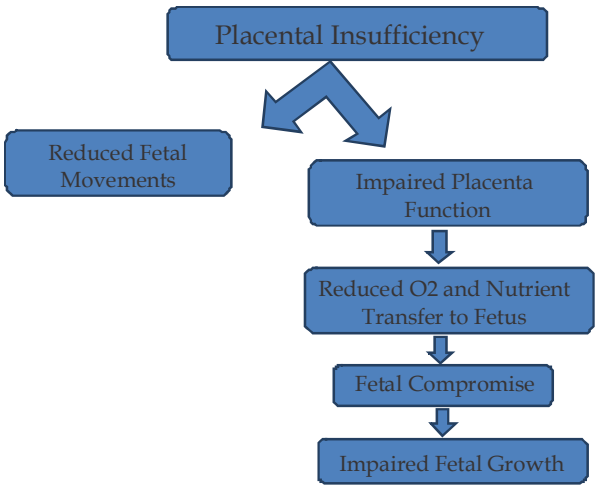


**Fig. 1:**

Both pathological and non-pathological conditions are associated with RFM (Fig. 1).

Intrauterine fetal death (IUFD) is preceded by a reduction in fetal movements (RFM) for over 24 hours in up to 50% of cases.[8,16] Philip Dutton state that RFM is linked to FGR and stillbirth as a clinical manifestation of the fetus reacting to nutrient and oxygen deprivation secondary to placental insufficiency.[13]

The relationship between diastolic blood pressure, estimated fetal weight centile, log [hPL] and poor perinatal outcome after RFM is likely to relate to their association with placental dysfunction.[17] Following RFM, estimated fetal weight has the strongest association with poor perinatal outcome. Ultrasound assessment of fetal size and liquor volume is associated with reduction in stillbirth in women with RFM.[3] Study conducted by Biswas and Ghosh revealed that RFM were associated with umbilical cord abnormalities and IUGR in SGA pregnancies.[18] Combination of lateral cord insertion and abnormal placental shape has been proposed by Salafia *et al*. to lead to reduced placental efficiency, possibly due to alterations of placental vascularity and branching, providing a mechanism linking abnormal placental shape with RFM, SGA and stillbirth.[19]

In some women with RFM, a placental biomarker may be a useful predictor of poor pregnancy outcome.[15]

A wide range of investigations are performed for the complaint of reduced fetal movements after clinical examination. Investigations considered include–

- Formal fetal movement counting (kick charts),
- Symphysio-fundal height measurement (SFH),
- Vaginal examination.
- Biophysical Profile,
- Estimation of Fetal Weight (EFW),
- Liquor assessment,
- Cardiotocography (CTG),
- Non-stress test (NST),
- Umbilical artery Doppler Velocimetry(21).

Between 24–28 weeks of gestation, auscultation of the fetal heart may be sufficient and CTG can be performed.[21] The absence of accelerations or the appearance of decelerations in FHR along with a history of reduced fetal movements may indicate fetal hypoxia and is associated with fetal demise and caesarean section delivery.[20,21]

Cardiotocography is useful in the detection of acute hypoxia but is a poor test for chronic hypoxia.[21] Korszun *et al*. suggested that adding umbilical artery and uterine artery Doppler velocimetry to conventional CTG in the assessment of reduced fetal movements may be reassuring for the managing clinician.[22] If the perception of reduced fetal movements persists, consideration should be given to other causes such as fetal structural anomalies (4.3%),[1] anaemia or fetomaternal haemorrhage.[23] A blood test should ultimately be considered, to look for maternal metabolic disorders or fetomaternal haemorrhage. Smoking should be discouraged. If concerns persist

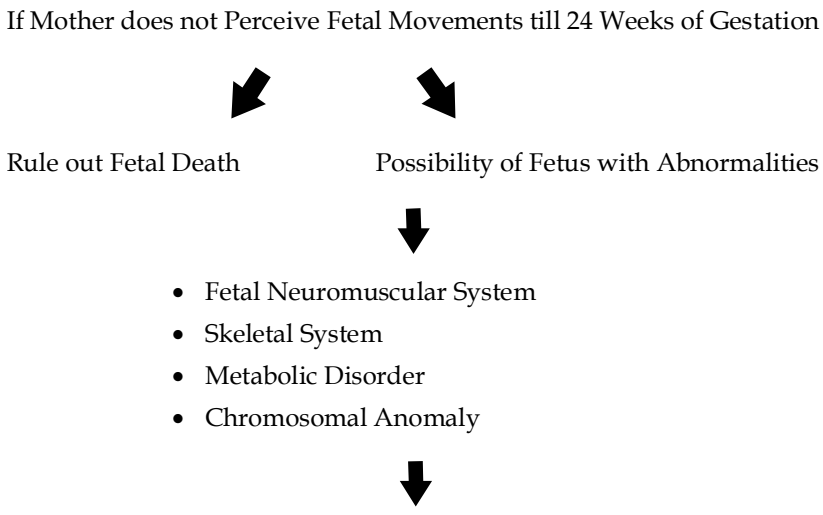


**Fig. 2:**

in later gestation, induction of labour or delivery can be considered.[21]

**Interpretation**

Previous literature has suggested that the frequency of fetal movements increases until the 32 weeks of pregnancy and then plateaus.[25,26] NST and ultrasound examination are the most useful tools for fetal surveillance in DFM.[11] Increased women's awareness of the need for prompt reporting of RFM and that standardised management, including timely delivery, would alter the incidence of stillbirth.[12] Repeated episodes of reduced fetal movement can be so stressful to the mother that some doctors are persuaded to induce, even if further tests are normal.

**Discussion**

Maternal perception of fetal movement is one of the first signs of fetal life and is regarded as clinical indicator of fetal well being. Changes in the number and nature of fetal movements as the fetus matures are considered to be a reflection of normal neurological development of fetus. From as early as 20 weeks of gestation fetal movements show diurnal variation. The afternoon and evening periods are periods of peak activity. It is beneficial to request all pregnant woman, to monitor fetal movements (starting from 28 weeks of the gestation), irrespective of risk factors.

Decreased frequency of fetal movements is associated with risk of stillbirth as is decreased strength.[27] In spite of technological advances, role of clinical acumen, detailed history, proper counselling is vital. Technology is not substitute for history taking and clinical acumen. In Developing country, there are many obstetrics care units where facilities for USG are not available. In such low resource settings, maternal perception of reduced fetal movement plays vital role in early detection of fetal jeopardy. This will facilitate timely intervention and prevent adverse perinatal outcome.

**Conclusion**

Maternal perception of fetal movement is an accepted marker for fetal well-being. Fetal movements reflect fetal conditions in utero. Changes in activity can indicate fetal compromise. Every mother presenting with concern about reduced fetal movements should be taken seriously. Counselling to pregnant women with reduced fetal movement is important. She is worried about health of her baby so it is very important to give her clear information about these symptoms, likely interventions and prognosis. If a woman perceived reduced fetal movements, fetal surveillance should be done with NST and USG examination. Maternal perception of fetal movement is self-screening, inexpensive and non-invasive method for clinical assessment of fetal well-being, in low resource settings, playing crucial role in early detection of fetal jeopardy.

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