Factors associated with reduced foetal movements in Iringa, Tanzania

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ABSTRACT

Introduction: Maternal perception of foetal movement ensures foetal wellbeing. Reduced foetal movement is associated with foetal hypoxia, stillbirths, and intrauterine foetal growth restriction (IUFGR). This study aimed at assessing factors that are associated with maternal perception of reduced foetal movements.

Method: This was a cross-sectional study that was conducted at Iringa Regional Referral Hospital from 1st January – 30th June 2022. A purposive sampling technique was used, and SPSS version 25 software was used for data analysis.

Results: 41.3 % of study participants were aged 24 – 34 years, with a mean and SD of 29.08 ±7.53. 75% were not employed, 52.8 % of study participants delivered from 37 – 42 weeks of gestational age, 66.1% had a posterior placenta and only 24.0 % had an anterior placenta. Women who delivered at 28 – 36 weeks of gestational age were about 4 times more likely to experience reduced foetal movement compared to those who delivered at 37 – 42 weeks of gestation (AOR=4.162, 95% CI 2.174 - 7.966, p=<0.0001). Those who attended the Antenatal clinic 2 – 3 times were 2 times more likely to complain of reduced foetal movement compared to those who attended 4 times and above (AOR = 2.655, 95% CI 1.311 - 5.375, p=0.0067).

Conclusion: Reduced foetal movements are associated with lower gestation age at delivery and decreased antenatal clinic attendance in Iringa, Tanzania. All pregnant women should be encouraged to make early antenatal clinic attendance and should attend adequate visits. Healthcare providers should educate and create awareness on methods of assessing foetal movements.

Keywords: foetal movement, factors associated, Tanzania

INTRODUCTION

Reduced foetal movement is becoming a common complaint among pregnant women in Tanzania. This complaint brings fear of losing a baby and necessitates a need to urgently visit a doctor at a nearby health facility for assessment. There are several ways that can be used to assess foetal movements, these include the Sadovsky and Cardiff methods.[1] These methods involve the maternal perception of foetal movements, and they are the currently widely used method in countries with limited resources. Foetal movements can also be assessed by an obstetric ultrasound as a component of the foetal biophysical profile.

The foetal biophysical profile consists of parameters that aid in assessing foetal well-being before delivery, this consists of four areas assessed by ultrasound which are foetal breathing movements, foetal movements, foetal tone, and amniotic fluid volume. Currently in Iringa there is a modified foetal biophysical profile that consists of two parameters which are the non-stress test and amniotic fluid index.[1,2]

Most primigravidas are observed to perceive foetal movements at the 18th – 20th week of gestation age while multigravidas perceive foetal movements at the 16th

– 18th week of gestation age. The Sadovsky and Cardiff methods are mainly used in the third trimester, the Cardiff method (which is getting the woman to count movements until she has felt 10) and the Sadovsky method (which is getting the woman to count how many movements she has in an agreed time frame) all aim at ensuring the wellbeing of the foetus in high-risk pregnancies.[3,4]

Normally the foetus has a period of physical movement, rest, and sleep. Foetal movement increases as the gestation age advance up to 32 weeks of gestation age, when it reaches a plateau and goes at that level to term.[3,4] Foetal movement indicates the neurological development and maturation of the foetus.[5]

The foetus has been observed to reduce movements to compensate and conserve energy so that it can survive placental insufficiency, and this is by reserving oxygen and nutrient transfer. However, it becomes a problem when the situation is prolonged, leading to foetal compromise requiring further evaluation using a cardiotograph known as a CTG which may find that an urgent delivery of the foetus is necessary. This phenomenon has been studied histopathologically and revealed that placentas from women with reduced foetal movements had greater signs of infarction and other signs that the placenta is not optimal.[6]

This study aimed at assessing factors that are associated with reduced foetal movements in Iringa Tanzania. Some of the studied factors included parity, gestational age, overweight/obesity, the volume of amniotic fluid, foetal sleep state, maternal obesity, smoking, nulliparity and placenta location.

METHOD

This was a 6 months' cross-sectional prospective study conducted from 1st January – 30th June 2022 at a teaching tertiary - Iringa Regional Referral Hospital (IRRH) located in the southern highlands of Tanzania. The study was conducted in the Department of Obstetrics and gynaecology but also in the Neonatal Unit. Apart from other staff, these two units have 3 obstetricians and gynaecologists and 2 paediatricians who also work at the Neonatal unit.

This study included all third-trimester pregnant women who were admitted with a complaint of reduced foetal movements in the Department of Obstetrics and Gynaecology. Participants were recruited from antenatal clinics, antenatal and labour wards. Twin pregnancies, women with already intrauterine foetal demise (IUFD) and women who were not able to consent were excluded from this study.

A structured questionnaire was used to collect data by the researcher and a sample size of 269 participants was obtained. A full history was taken from all study participants. Variables studied included maternal age, education, gravity, parity, residence, marital status, occupation, gestation age at delivery, number of antenatal clinic visits, haemoglobin level, the volume of amniotic fluid, foetal sleep state, maternal obesity, smoking, nulliparity and placenta location.

After being enrolled in this study, pregnant women complaining of reduced foetal movements were assessed, by an experienced obstetrician.

For those who were critically needing help intervention was done. Those who were not needing such help were put in an emergency room for observation. These women were told that infrequent foetal movements did not necessarily mean the foetus was inactive or in a compromised environment. Women were instructed in the Sadovsky kick count method of assessing foetal activity. In this method if the counts were less than 10 kicks over two consecutive hours when the foetus was active and the woman lying on her side after a meal and focused on counting then reduced foetal movements were suspected. Those with suspected reduced foetal movements had foetal monitoring or assessment using the CTG and obstetric ultrasound for biophysical profile. Those with a baseline foetal heart rate (110 – 160 bpm) with a variability of 5 – 25 bpm without late decelerations were put for continuous observation. For women with prolonged foetal tachycardia/bradycardia, variability of less than 5 bpm for more than 50 minutes or more than 25 bpm for more than 25 minutes or the presence of features of late decelerations an urgent intervention was done.

Maternal body mass index was not calculated because participants were recruited in the third trimester. Obstetric ultrasound was done by an experienced radiologist to assess amniotic fluid volume, foetal weight, placenta location, placenta status, and foetal presentation. Foetal biophysical profile was also assessed. Placental status like calcifications and placental abruption, breathing movements and congenital malformations of the foetus were also assessed. Uterine artery Doppler ultrasound was performed transabdominally to assess umbilical blood flow in those with placenta insufficiency.

Blood pressure was recorded on admission and factors including maternal diabetes, preeclampsia, anaemia, placenta praevia, placental abruption, premature rupture of membranes, anterior placenta, smoking, use of sedative drugs and use of glucocorticoids were checked and ruled out.

All continuous data were summarized using median with interquartile range. Categorical data were summarized using proportion. The factors associated with reduced foetal movement were determined by first cross tabulation then later unadjusted and last adjusted models. Odds ratios and a p-value of less than 0.05 was considered significant,

Table 1. Association of demographic characteristics and reduced maternal perception of foetal movements

	All n (%)	Normal n (%)	Reduced movement n (%)
Age			
12-24	88 (29.3)	55 (62.5)	33 (37.5)
25-34	124 (41.3)	92 (74.2)	32 (25.8)
35+	88 (29.3)	65 (73.9)	23 (26.1)
Marital status			
Married	213 (71.0)	153 (71.8)	60 (28.2)
Single	87 (29.0)	59 (67.8)	28 (32.2)
Education			
No formal education	29 (9.7)	15 (51.7)	14 (48.3)
Primary	111 (37.0)	81 (73.0)	30 (27.0)
Secondary	92 (30.7)	65 (70.6)	27 (29.4)
College and above	68 (22.7)	51 (75.0)	17 (25.0)
Parity			
1	81 (27.0)	49 (60.5)	32 (39.5)
2	48 (16.0)	39 (81.3)	9 (18.8)
3	69 (23.0)	51 (73.9)	18 (26.1)
4	59 (19.7)	41 (69.5)	18 (30.5)
5+	43 (14.3)	32 (74.4)	11 (25.6)
Occupation			
Employed	75 (25.0)	59 (78.7)	16 (21.3)
Unemployed	225 (75.0)	153 (68.0)	72 (32.0)
Number of antenatal clinic visits			
0	23 (7.7)	11 (47.8)	12 (52.2)
1	19 (6.3)	13 (68.4)	6 (31.6)
2-3	116 (38.7)	76 (65.5)	40 (34.5)
+4	142 (47.3)	112 (78.8)	30 (21.1)
Gestational age (in weeks) at delivery			
28-36	113 (44.5)	56 (49.6)	57 (50.4)
37-42	134 (52.76)	105 (78.4)	29 (21.6)
≥ 42	7 (2.7)	6 (85.7)	1 (14.3)
Placenta location			
Anterior	70 (24.0)	58 (82.9)	12 (17.1)
Posterior	193 (66.1)	130 (67.7)	62 (32.3)
Praevia (grade 3 and 4)	22 (7.5)	16 (72.7)	6 (27.3)
Calcification	4 (1.4)	4 (100.0)	0 (0.0)
Low lying (grade 1 and 2)	3 (1.0)	3 (100.0)	0 (0.0)

and their 95% confidence intervals were constructed.

Ethical clearance was obtained from the University of Dodoma, Research and Publication Committee, and permission to conduct the study was obtained from the regional administration of Iringa region and from the Medical Officer in charge of Iringa Regional Referral Hospital.

RESULTS

Sociodemographic characteristics of the study participants

In this study, 41.3% of study participants were aged 24 – 34 years with a mean and SD of 29.1 ±7.5 years; 27% were primipara; 47.3% had attended antenatal clinics

Table 2. Factors associated with maternal perception of reduced foetal movements

Variable	Unadjusted analysis OR [95%CI]	p-value	Adjusted analysis AOR [95%CI]	p-value
Age				
12-24	1.688 [0.870, 3.277]	0.1216	1.684 [0.569,4.981]	0.3466
25-34	1.009 [0.531, 1.917]	0.9774	1.105 [0.493,2.477]	0.8093
35+	Ref		Ref	
Education				
No formal education	2.975 [1.186, 7.462]	0.0202	2.200 [0.582, 8.317]	0.2454
Primary	1.062 [0.522, 2.163]	0.8673	0.686 [0.260, 1.811]	0.4462
Secondary	1.177 [0.567, 2.445]	0.6624	0.936 [0.377, 2.320]	0.8859
College and above	Ref		Ref	
Parity				
1	1.722 [0.755, 3.928]	0.1966	2.217 [0.616, 7.987]	0.2232
2	0.671 [0.248, 1.820]	0.4335	1.029 [0.265, 3.985]	0.9675
3	0.913 [0.376, 2.213]	0.8397	1.256 [0.387, 4.081]	0.7045
4	1.135 [0.463, 2.781]	0.7814	1.468 [0.468, 4.603]	0.5101
5+	Ref		Ref	
Occupation				
Employed	Ref		Ref	
Unemployed	1.845 [0.964,3.534]	0.0645	1.227 [0.510, 2.951]	0.6484
Number of antenatal clinic visits				
0	4.699 [1.868, 11.824]	0.0010	2.507 [1.311, 7.894]	0.1164
1	1.325 [0.400, 4.397]	0.6451	0.792 [0.171, 3.664]	0.7651
2-3	2.211 [1.243, 3.930]	0.0069	2.655 [1.311, 5.375]	0.0067
4+	Ref		Ref	
Gestation age (in weeks) at delivery				
37-42	Ref		Ref	
28-36	4.297 [2.409, 7.666]	<.0001	4.162 [2.174, 7.966]	<.0001
42 and above	0.729 [0.084, 6.342]	0.7748	0.651 [0.063, 6.733]	0.7188
Blood pressure				
120/80 or less	Ref		Ref	
140/90 and above	1.044 [0.527,2.070]	0.9008	1.449 [0.623, 3.370]	0.3895
160/110 and above	3.263 [1.508,7.062]	0.0027	1.819 [0.693, 4.772]	0.2244

four or more times; 52.8% of study participants delivered from 37 – 42 weeks of gestation age; 66.1% had a posterior placenta while 24.0 % has an anterior placenta. See table 1.

Factors associated with maternal perception of reduced foetal movements

In this study, women who attended antenatal clinic 2 – 3 times had a three times chance of complaining of reduced foetal movements compared to those who attended four times and above. Women who delivered at a gestational age of 28 – 36 weeks had a four times chance of experiencing reduced foetal movements compared to those who delivered at 37 – 42 weeks of gestation age. Maternal age, education, occupation, parity, overweight/obesity, gestation age, placenta location, amniotic fluid volume, and blood pressure were found to be not associated with the reduced foetal movements. Variables like type, duration, characteristic, and strength of the foetal movements, foetal position, maternal position, psychological factors, sedatives, and other drugs were not assessed in this study. See table 2.

DISCUSSION

Assessing maternal perception of foetal movement in resource-limited areas has been observed to decrease perinatal mortality although 75% of women who are assessed due to complaints of reduced foetal movements will have normal pregnancy outcomes.[7,8] Four to 18 % of all pregnant women report a decrease in foetal movement at some point during the antenatal period and it has been revealed that decreased foetal movements are associated with adverse perinatal outcomes including preterm deliveries, stillbirths, and foetal growth restrictions.[9,10]

In India, most pregnant women who reported a reduction in foetal movements were 20 – 30 years of age, 80% were primigravida, which is like findings of this study in which 41.33% were aged 25 – 34 years of age and most were primigravidas. This study in India and another in Israel revealed that these women had an anterior placenta which is contrary to the finding of this study in which an anterior placenta was not found to be associated with a reduction in foetal movement.[11,12]

Other studied factors that might affect the maternal perception of reduced foetal movements included parity, gestational age, overweight/obesity, and placenta location. In this study, only lower gestation age and lower number of antenatal clinic visits were associated with reduced perception of foetal movements which is contrary to a study in Australia that revealed that psychological factors and duration of foetal movements may affect the perception of foetal movements. Lack of awareness/knowledge of the importance of antenatal clinic visits may explain why most of the participants in this study had fewer antenatal clinic attendances. And this is evidenced by the education level in which a larger group (37%) had attained a primary level of education.[2]

In Iran, 8.1% of all healthy pregnant women complaining of reduced foetal movements had a good outcome, and maternal employment was among the factors that were associated with reduced foetal movements which is contrary to the findings of this study in which maternal employment wasn't found to be associated with a reduction in foetal movement, this might be because 75% of study participants were unemployed while in Iran most of the study participants were employed.[13]

It is important to create awareness and educate pregnant women during the antenatal period about reduced foetal movements and their adverse outcomes since maternal awareness of reduced foetal movement and an early decision to visit a nearby health facility have been observed to decrease stillbirths.[14]

CONCLUSION AND RECOMMENDATION

This study found that fewer antenatal clinic attendance and lower gestation age are highly associated with the maternal perception of reduction of foetal movements. Awareness creation and education of pregnant women in Iringa Tanzania on the importance of Antenatal clinic attendance and evaluation of pregnancies when women are worried about reduced foetal movements will aid in decreasing preterm deliveries and also prevent stillbirths in Iringa, Tanzania.

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References

1. Cunningham F, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, Spong CY. eds. Williams Obstetrics, 25e. McGraw Hill; 2018
2. Hijazi ZR., East CE, Factors affecting the maternal perception of fetal movement. Obstet. Gynecol. Surv.2009;64(7):489-497. https://dx.doi.org/10.1097/OGX.0b013e3181a8237a
3. Natale R, Nasello-Paterson C, Turliuk R. Longitudinal measurements of fetal breathing, body movements, heart rate, and heart rate accelerations and decelerations at 24 to 32 weeks of gestation. Am. J. Obstet. Gynecol. 1985;151(2):256 - 263. https://doi.org/10.1016/0002-9378(85)90022-5
4. Eller DP, Stramm SL, Newman RB. The effect of maternal intravenous glucose administration on fetal activity. Am. J. Obstet. Gynecol.,1992;167(4):1071-1074. https://doi.org/10.1016/S0002-9378(12)80040-8

5. Heazell A. Reduced fetal movements. BMC Pregnancy Childbirth 2012;12(1). https://doi:10.1186/1471-2393-12-S1-A10

6. Warrander LK et al. Maternal perception of reduced fetal movements is associated with altered placental structure and function. PLoS One 2012 ; (7):1–9. https://doi:10.1371/journal.pone.0034851

7. Patrick J,Campbell K, Carmichael L, Natale R, Richardson B. Patterns of gross fetal body movements over 24-hour observation intervals during the last 10 weeks of pregnancy. Am. J. Obstet. Gynecol. 1982;142(4);363-371. https://doi:10.1016/S0002-9378(16)32375-4

8. Bekedam DJ, Visser GHA, De Vries JJ, Prechtl HFR. Motor behaviour in the growth retarded fetus, Early Hum. Dev. 1985; 12 (2):155–165. https://doi:10.1016/0378-3782(85)90178-1

9. Hayes DJ, Smyth RM, Heazell AE. Investigating the significance and current state of knowledge and practice of absent or reduced fetal movements in low and lower middle-income countries: a scoping review. J. Glob. Heal. Reports 2019; 3:1–12 . https://doi.org/10.29392/joghr.3.e2019023

10. Gardener G et al. Clinical practice guideline for the care of women with decreased fetal movements. Brisbane Cent. Res. Excell. Stillb. 2017: 1–33.

11. Nandi N, Agarwal R. Prospective study of maternal perception of decreased fetal movement in third trimester and evaluation of its correlation with perinatal compromise. Int. J. Reprod. Contraception, Obstet. Gynecol. 2019; 8(2): 687. https://dx.doi.org/10.18203/2320-1770.ijrcog20190306

12. Mohr Sasson A, Tsur A, Kalter A, Weissmann Brenner A, Gindes L, Weisz B. Reduced fetal movement: Factors affecting maternal perception. J. Matern. Neonatal Med. 2016; 29 (8):1318–1321. https://doi:10.3109/14767058.2015.1047335

13. Sheikh M, Hantoushzadeh S, Shariat M. Maternal perception of decreased fetal movements from maternal and fetal perspectives, a cohort study. BMC Pregnancy Childbirth 2014;14(1): 1–7. https://doi:10.1186/1471-2393-14-286

14. Koshida S, Tokoro S, Katsura D, Tsuji S, Murakami T, Takahashi K. Fetal movement counting is associated with the reduction of delayed maternal reaction after perceiving decreased fetal movements: a prospective study. Sci. Rep. 2021;11(1):11–16. https://doi:10.7860/JCDR/2016/16808.7296