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ORIGINAL RESEARCH

Relationship Between Subchorionic Haematoma and Abdominal Massage in Pregnancy in the Niger Delta Region of Nigeria: A Pilot Study

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Abstract

Background: Abdominal massage (AM) in pregnancy is a common practice in the Niger Delta region of Nigeria. AM may cause events such as subchorionic haematoma (SAH) and increase the risk of miscarriages and adverse maternal and perinatal outcomes.

Objective: To determine the relationship between AM and SCH in the Niger Delta region of Nigeria.

Methods: A cross-sectional study was conducted from January to June 2022 at the Obstetrics and Radiology Units of four health facilities in Bayelsa State, Nigeria. Consenting eligible pregnant women presenting to the antenatal clinic during the first trimester were consecutively included. An obstetric ultrasound scan was performed transabdominal.

Results: Of the 403 women recruited, 241 (59.8%) were aged (20 - 29 years). The mean age was 28.02 ± 5.99 years. The mean body mass index was 23.82 ± 4.60 kg/m². While 170 (42.2%) had undergone AM in the first trimester of the index pregnancy, 126 (31.3%) had vaginal bleeding, and SCH occurred in 109 (27.0%) women. Women who had AM had 210 (CI: 58 - 878) times the odds of having SCH and 3.3 (CI: 2.14 - 5.15) times the odds of vaginal bleeding than women who did not have AM. Only 2 (1.8%) women with SCH did not have AM.

Conclusion: There exists a strong association between the occurrence of SCH among pregnant women who have had AM. More health education is needed for women in the Niger Delta region and Nigeria to eradicate the archaic practice and improve pregnancy outcomes.

Keywords: Abdominal massage, Niger Delta, Pregnant women, Subchorionic haematoma.

Introduction

The practice of abdominal massage (AM) in and out of pregnancy has been on for a long time in Central America, Asia, China, Sweden, Egypt and Nigeria. [1-4] It is usually conducted by Traditional Birth Attendants (TBAs). The benefit of AM in pregnancy has not been scientifically proven; however, practitioners and their clients claim it relieves mild to moderate body pains during pregnancy and improves foetal well-being. Abdominal massage is a common practice in pregnancy in the Niger Delta region of Nigeria. [3] In a previous study in the southern region of Nigeria, 78% of pregnant women were reported to have had an abdominal massage.[4]

Several consequences of abdominal massage in pregnancy are known in the literature. Some of these include vaginal bleeding consequent to subchorionic haematoma (SCH), *abruptio placentae* and uterine rupture, miscarriages, preterm delivery, injury to the foetus and intrauterine foetal death. [3] SCH can occur alone or in association with vaginal bleeding, a common complication in the first trimester of pregnancy, occurring in about 16 - 25% of pregnancies.[5]

The mechanism of SCH following AM is the partial separation of the chorion from the uterine wall due to trauma, and the bleeding accumulates and becomes a haematoma. Depending on the degree of chorionic detachment, there may be associated vaginal bleeding. SCH is often an incidental finding during routine pregnancy ultrasound scans (USS), and some women will have a history of

having had AM a few days before presenting for the USS. SCH appears as hypoechoic or anechoic crescent-shaped areas on USS.

Apart from AM, other predisposing factors for SCH include recurrent pregnancy losses, malaria, urinary tract infections, uterine anomalies, and autoantibodies. [3,6-8] There are conflicting reports in the literature on the significance of SCH in early pregnancy.[7-11] However, the presence of SCH in pregnancy may increase the risk of miscarriages and adverse maternal and perinatal outcomes.[7-11] Therefore, this research aimed to determine the prevalence of AM and the relationship between AM and SCH in the Niger Delta region of Nigeria, where the study was conducted.

Methods

This descriptive, cross-sectional study was conducted at the Obstetrics Units and Radiology Departments of the Federal Medical Centre, Yenagoa, Niger Delta University Teaching Hospital, Okolobiri, Diète Koki Memorial Hospital, Yenagoa, and Silhouette Radiodiagnostic Consultants, Yenagoa, all in Bayelsa State. It was conducted from January to June 2022. The first two study centres are tertiary health facilities that provide specialised obstetric and gynaecological services to women in Bayelsa State and serve as referral centres for other hospitals in Bayelsa State and surrounding Rivers and Delta States, both in southern Nigeria. The third study centre is a secondary health institution, while the fourth is the most

prominent Radiodiagnostic Institution in Bayelsa State.

Ethical approval for this study was obtained from the Research and Ethics Committee of the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria (FMCY/REC/ECC/2022/623).

The sample size for this study was calculated using the formula:

$$n = z^2pq/d^2 \text{ [12]}$$

Where:

n = minimum sample size

z = normal standard deviation set at 95% confidence limit = 1.96

p = proportion of women in the target population with subchorionic haematoma, which is 50% (50% = 0.5).^[12]

q = 1 - p (complementary probability).

d = margin of error = 5% = 0.05

'n' was calculated as 403

Four hundred and three consecutive women were recruited for this study. Consecutive patients that presented to the antenatal clinic during the first trimester of pregnancy were recruited for the study.

All the patients with recent anterior abdominal wall trauma were excluded from the study. Women who met the inclusion criteria for the study were counselled and enrolled after obtaining written informed consent. The age, parity, gestational age, and any presenting complaints were obtained and documented. They were referred to the Radiology Department for an ultrasound scan.

A transabdominal ultrasound scan was performed on each patient about one hour after drinking about one litre of water to have a full urinary bladder, which serves as an excellent acoustic window. With the patient lying supine and the abdomen and pelvis exposed, adequate ultrasound gel was applied to the lower

abdominal wall or pelvis. The gel served to remove air from the skin and ease transducer movement. A 2012 Philips HD11 machine, fitted with a 3.5 MHz curvilinear (convex) transducer (probe), was used to scan. The probe was moved back and forth on the skin, and in orthogonal planes, with gain adjusted, as required, for good image quality. The entire uterine wall and cervical regions were assessed for SCH, which appears hypoechoic or anechoic crescent-shaped areas on the ultrasound scan (Figure 1).

The data were entered into a pre-designed proforma and were analysed using the Statistical Product and Service Solutions for Windows® version 25, SPSS Inc.; Chicago, USA. The results are presented in frequencies and percentages for categorical variables, and means and standard deviations were determined for continuous variables. The Chi-Squared test and Odd ratio were used to test for associations between categories. *P* value less than 0.05 defined statistical significance at 95% Confidence Interval.

Results

Table I shows that out of the 403 women studied, 241 (59.8%) were in the third decade of life (20 - 29 years) while about a third (29.0%) were aged between 30 and 39 years. The Estimated Gestational Age ranged from 6 to 14 weeks, while the parity of the women ranged from 0 to 8. The mean age of the women was 28.02 ± 5.99 years. The mean weight, height and body mass index (BMI) of the women were 63.5 ± 11.4 kg, 1.63 ± 0.06 m and 23.82 ± 4.60 kg/m², respectively. About a tenth (48; 11.9%) of the women were obese.



Figure 1: Sonogram showing subchorionic haematoma (red arrow).

Table I: Age, anthropometric measurements, and parity of participants

Characteristics	Frequency (N = 403)	Percentage
Age (years)		
16 - 18	23	5.7
20 - 29	241	59.8
30 - 39	117	29.0
> 40	22	5.5
Body Mass Index		
Underweight	22	5.5
Normal weight	256	63.5
Overweight	77	19.1
Obese	48	11.9
Parity		
Nulliparity	234	58.1
Primiparity	46	11.4
Multiparity	108	26.8
Grand-multiparity	15	3.7

Vaginal bleeding was reported in 126 (31.3%) women, while SCH was discovered in 109 (27.0%) women. Other USS findings included corpus luteum cyst (36; 8.9%), uterine fibroid (18; 4.5%) and ovarian cystadenoma (2; 0.5%) (Table II). Only five out of the 18 patients with uterine fibroids had SCH. These same (5) patients also had an abdominal massage. One hundred and

seventy participants had undergone AM in the first trimester of the index pregnancy, giving a prevalence rate of AM in pregnancy of 42.2%. Participants aged 40 years and above (OR = 39.38; $p = 0.001$) and underweight women (OR = 4.28; $p = 0.008$) had significantly higher odds of having AM (Table III).

Table II: Ultrasound/Clinical findings in the first trimester of pregnancy.

Characteristics	*Frequency (N = 403)	Percentage
Vaginal bleeding	126	31.3
Subchorionic haematoma	109	27.0
Other ultrasound findings		
No other uterine finding	347	86.1
Uterine fibroid	18	4.5
Corpus luteal cyst	36	8.9
Ovarian cystadenoma	2	0.5

*Multiple findings in some women

Table III: Relationship between abdominal massage and age, Body Mass Index and parity of study participants

Characteristics	Abdominal massage		Chi-square (p-value)	OR (95%CI)	p-value
	Yes Frequency (%)	No Frequency (%)			
Age (years)					
16 - 19 (n = 23)	8 (34.8)	15 (65.2)	32.3	1	
20 - 29 (n = 240)	92 (38.2)	148 (61.8)	(0.001*)	1.15 (0.47 - 2.84)	0.749
30 - 39 (n = 117)	48 (41.0)	69 (59.0)		1.30 (0.51 - 3.32)	0.577
> 40 (n = 23)	22 (95.7)	1 (4.3)		39.38 (4.44 - 348.98)	0.001*
Body Mass Index					
Underweight (n = 22)	15 (68.2)	7 (31.8)	13.5	4.28 (1.46 - 12.61)	0.008*
Normal weight (n = 256)	116 (45.3)	140 (54.7)	(0.004*)	1.66 (0.87 - 3.17)	0.127
Overweight (n = 77)	23 (29.9)	54 (70.1)		0.80 (0.37 - 1.74)	0.574
Obese (n = 48)	16 (33.3)	32 (66.7)		1	
Parity					
Nulliparity (n = 234)	71 (30.3)	163 (69.7)	48.1	1	
Primiparity (n = 46)	31 (67.4)	15 (32.6)	(0.001*)	4.75 (2.41 - 9.33)	0.001*
Multiparity (n = 108)	53 (49.1)	55 (50.9)		2.21 (1.38 - 3.54)	0.001*
Grand multiparity (n = 15)	15 (100.0)	0 (0.0)		32.14 (4.15 - 249.12)	0.001*

With increasing parity, there was an increased likelihood that a woman would have had AM in the first trimester of pregnancy (Table III). There were three times higher odds (OR - 3.32; p= 0.001) of vaginal bleeding and two hundred times higher odds of SCH among women who had AM

compared to women who did not have AM. Of the study population's 111 (27.5%) women with SCH, 109 (98.2%) had AM in the index pregnancy. Only 2 (1.8%) women with SCH did not have AM (Table IV).

Table IV: Relationship between abdominal massage, vaginal bleeding and ultrasound scan findings

Characteristics	Abdominal massage		Chi-square (p-value)	OR (95%CI)	p-value
	Yes Frequency (%)	No Frequency (%)			
Vaginal bleeding					
Yes (n = 126)	78 (61.9)	48 (38.1)	29.2 (0.001)	3.32 (2.14 – 5.15)	0.001
No (n = 277)	92 (33.2)	185 (66.8)			
Subchorionic haematoma					
Yes (n = 111)	109 (98.2)	2 (1.8)	197.1 (0.001)	210.7 (50.58 – 878.02)	0.001
No (n = 292)	61 (20.9)	231 (79.1)			
Other ultrasound findings					
None (n = 347)	148 (42.7)	199 (57.3)	0.7 (0.882)	0.74 (0.05 – 11.85)	0.828
Uterine fibroids (n = 18)	6 (33.3)	12 (66.7)			
Corpus luteal cyst (n = 36)	15 (41.7)	21 (58.3)		0.71 (0.04 – 12.35)	0.817
Ovarian cystadenoma (n = 2)	1 (50.0)	1 (50.0)		1	

Discussion

Abdominal massage is a common practice among pregnant women in the Niger Delta region of Nigeria despite all public health efforts to increase awareness about its harmful effects and poor pregnancy outcomes. SCH is also a common USS finding, especially in pregnant women with an AM history. Therefore, this study sought to determine the prevalence of AM in the study cohort and explore the relationship between AM and SCH.

In this study, the prevalence of AM was 42.2%. This implies that about 4 in 10 women attending antenatal care at the study centres had had AM in the index pregnancy. This number is problematic, given all the well-known harmful effects of AM and its association with adverse pregnancy outcomes. This is, however, slightly lower than reported from an earlier study done in a hospital in the same region, which reported that about 5 in 10 women (54.5%) attending antenatal care had had AM in their index

pregnancies. [13] The gradual decline is worthy of note as a similar study done five years earlier in the same region reported a prevalence of 78%. [4] The downward trend in the prevalence of AM in pregnancy in the Niger Delta region of Nigeria may be attributed to public enlightenment efforts by healthcare workers educating women about the harmful effects of AM, both to the mother and the foetus. These efforts should continue until AM in pregnancy is completely eradicated.

The prevalence of AM in pregnancy in this study is lower than the 72.2% reported by Abasi *et al.* [14] in a survey of *abruptio placentae* and predisposing factors at the Niger Delta University Teaching Hospital in southern Nigeria. Differences in the characteristics of the study populations may likely explain the vast difference in prevalence rates. While the present study included all antenatal clinic attendees, save for those with a history of abdominal trauma, the study by Abasi *et al.* included only women with *abruptio placentae*.

However, the present study's prevalence of AM in pregnancy is higher than 14.79% reported by Ugboma and Akani ^[15] in a retrospective study of 284 pregnant women at the University of Port Harcourt Teaching Hospital, Port Harcourt, southern Nigeria. The higher prevalence rate in this study may be that attributed to the fact that all women seen at the antenatal clinic were included in the Port-Harcourt study. In contrast, the present study excluded women with a history of trauma to the abdomen. The exclusion of this group of women may have been responsible for the relatively higher prevalence in the present study. There is a shortage of research on AM in pregnancy in advanced countries, as the practice is alien in developed climes hence the difficulty in making comparisons of findings across regions.

In the present study, there was a two-hundred-fold increase in the likelihood of occurrence of SCH among women who had had AM. Abdominal trauma plays a role in the development of SCH or the complication of an existing SCH, resulting in bleeding and adverse pregnancy outcomes. Furthermore, in the present study, vaginal bleeding was three times more likely in women who had had AM. The degree of injury correlates with the intensity of AM, which is usually at the discretion of the individual therapist, who, in most cases, is a TBA. Only five out of the eighteen who had uterine fibroids had SCH, and these patients also had an abdominal massage. Therefore, it is unlikely that the presence of uterine fibroids was responsible for SCH in these women. There is no standard or protocol for AM, leaving room for unforeseen errors and complications. Many studies ^[16,17] including case reports, ^[18] have also linked the practice of AM to injury to other abdominal organs other than the uterus.

Conclusion

Abdominal massage is still a common practice among pregnant women in the Niger Delta region of Nigeria. More cases of SCH are seen amongst women who have had AM. More health education is needed for women in the region of study and Nigeria as a whole to eradicate this archaic practice and improve maternal pregnancy outcomes.

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Authors' Contributions: KEK conceived the study while OPC designed the study. KEK, UJU, AAO, AIJ, BP and AAD collected data. OPC and OC did a literature review, data analysis and interpretation. OPC drafted the manuscript, while BDC and UAE participated in the revision of the draft for sound intellectual content. All the authors approved the final version of the manuscript.

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