

Grandmultiparity: Evaluating Obstetric and neonatal outcomes after eliminating confounders

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Summary

Aims and Objectives: The objective was to evaluate obstetric and neonatal outcomes in booked grandmultiparas (para ≥ 5) and compare with outcome in age and social status matched booked multiparas (para 2-4) after eliminating confounders.

Patients and Methods: A cohort study with grandmultiparas (subjects) and age and social status matched multiparas as controls. All participants were counseled and an informed consent obtained at the antenatal clinic. Maternal demography and history were taken; they were subsequently monitored during pregnancy, labour and immediate puerperium. The main outcome measures were obstetric and neonatal outcomes among subjects and controls.

Results: The incidence of grandmultiparity was 4.1%. During antenatal period, grandmultiparas had statistically significantly higher occurrence of late antenatal booking ($P=0.0202$), anaemia ($P=0.0024$) and past history of poor perinatal outcome ($P=0.0124$).

Grandmultiparas had statistically significant occurrence of preterm delivery ($P=0.0389$) and higher but not statistically significant mean duration of labour ($P=0.3532$), intrapartum complications ($P=0.2014$) and postpartum haemorrhage ($P=0.2126$). Neonates of grandmultiparas had statistically significant low first minute Apgar scores ($P=0.0011$) with higher but not statistically significant occurrence of low birth weight ($P=0.1613$) and neonatal intensive care admission ($P=0.7202$). The perinatal mortality rates were 136 and 75 per 1 000 deliveries for grandmultiparas and multiparas. There were no maternal deaths during the study period.

Conclusion: After controlling for age and social class, booked grandmultiparas had poorer obstetric and neonatal outcome compared to booked multiparas but these were majorly statistically insignificant due to effect of modern antenatal care.

Key words: grandmultiparity, obstetric, neonatal, outcome, confounders.

Introduction

For many decades, studies have associated grandmultiparity with adverse obstetric and neonatal outcomes especially the rapidity with which fatal complications occur in such women.¹⁻³ Antepartum maternal complications include maternal hypertension, diabetes mellitus, antepartum haemorrhage (placenta praevia or abruption), anaemia in pregnancy and preterm

labour; while foetal complications include intrauterine growth restriction (IUGR), intrauterine foetal death and foetal malpresentation. Intrapartum complications are maternal anaemia in labour, abnormal foetal lie, increased risks for caesarean sections and instrumental vaginal deliveries as well as foetal heart rate abnormalities in labour. During the postpartum period, they are predisposed to developing postpartum haemorrhage,

increased risk for blood transfusion, perinatal asphyxia, increased neonatal intensive care admission in the babies, stillbirth as well as increased maternal and perinatal mortalities.¹⁻⁵

However in recent study reports, authors have advanced other confounding factors like advanced maternal age (with its attendant higher risk of developing medical disorders like chronic hypertension and diabetes mellitus) and adverse socioeconomic conditions which are prevalent among grandmultiparous women as being primarily responsible for the adverse outcomes.^{4,5}

Generally, findings on the association between high parity and poor maternal and foetal outcomes are not consistent. Although the older literatures tend to suggest that grandmultiparity is a risk factor for negative birth outcome, more recent reports are not supportive. Thus, there is the need for further studies in which these confounding factors are corrected for to add to the available evidence.

Materials and methods

The study was a cohort study and consisted of grandmultiparas (para⁵) i.e. subjects and age and social status matched multiparas (para 2-4) i.e. controls recruited at antenatal clinic and subsequently followed up till postpartum period from 1st January to 31st July 2010 at the University of Ilorin Teaching Hospital (UITH), Ilorin, Nigeria. Maternal demographic parameters, history of index pregnancy medical disorders and past history of perinatal complications were documented. Labour was managed actively with the use of partograph and the third stage of labour was managed actively by administration of 10iu oxytocin within one minute of delivery in all participants. Hypertension was defined as a systolic blood pressure of ≥ 140 mmHg or diastolic of ≥ 90 mmHg measured on two occasions at 4-6 hours apart. Chronic hypertension was defined as hypertension before conception or before the twentieth week of gestation, Preeclampsia was hypertension with proteinuria after the twentieth week of gestation while Pregnancy Induced Hypertension (PIH) was hypertension without proteinuria after the twentieth week of gestation.

Late antenatal booking was defined as booking after 20weeks of gestation. The social status was according to Olusanjo *et al*.⁶

The main outcome measures were the obstetric and neonatal outcomes as well as maternal postpartum condition among both grandmultiparas and the multiparas.

Ethical consideration

Ethical approval was obtained from the Ethics and Research committee of the University of Ilorin Teaching Hospital (UITH), Ilorin before the commencement of this study. Individual consent was obtained from participating women at recruitment into this study. The study was

conducted in accordance with the Helsinki declaration on conduct of research in human subjects.

Sampling technique

Purposive non probability sampling which involve recruitment of all consenting grandmultiparas until the desired sample size was completed. Controls were the next consenting matched multiparas who presented for antenatal care.

Inclusion criteria

Subjects were pregnant women who have carried five or more previous pregnancies to 28 weeks or more i.e. Para ≥ 5 who consented to participate. Controls were age and social status matched women of lower parity i.e. Para 2-4 who consented to participate.

Exclusion criteria

Women with previous caesarean delivery or those who refused to participate in the study.

Data Analysis

Data obtained were analysed using EPI-INFO-6 software and P-values < 0.05 were taken as significant.

Sponsorship/ Conflict of interest

Results

There were 1,853 deliveries of which 76 were grandmultiparas giving the incidence of grandmultiparity as 4.1%. Out of these, 12 women were not included in the study because they did not satisfy the inclusion criteria. The mean age of grandmultiparas was 36.20 ± 4.23 years (range 25-48years) while 66.7% were of low social class (Classes 4 and 5). According to the study design, the age and social class were the same for both grandmultiparas and multiparas. The mean parity for grandmultiparas was 5.4 ± 0.569 and 2.7 ± 0.671 for multiparas.

Table i showed that grandmultiparas were significantly late at booking for antenatal care as 48(70.0%) of them booked after 20weeks gestation compared to 31(48.4%) among multiparas with $P = 0.0202$. Grandmultiparas were significantly anaemic at booking with mean Hb 9.70 ± 1.08 and 9.95 ± 0.73 for multiparas ($P = 0.0024$) while 28(43.8%) of grandmultiparas and 14(21.9%) of controls have had previous poor perinatal outcome with $P = 0.0124$. In addition, there were more cases of medical disorders in pregnancy among grandmultiparas although these were not statistically significant.

Obstetric outcome as shown in table ii revealed that there were significantly more cases of preterm delivery ($P = 0.0389$) and anaemia at presentation in labour i.e. Hb < 10 g/dl ($P = 0.0076$) among grandmultiparas compared to controls. Induction of labour was higher among grandmultiparas 13(20.3%) compared to multiparas 8(12.2%) but it was not statistically significant ($P = 0.4159$). The caesarean section rate was 20% among subjects and controls. Grandmultiparas had more cases of intrapartum

complications ($P = 0.2014$), postpartum haemorrhage ($P = 0.2126$) and blood transfusion ($P = 0.4108$) compared to multiparas although these were not statistically significant. There were no maternal deaths during the study period. Table iii showed that grandmultiparas had generally poorer neonatal outcomes compared to multiparas. First minute Apgar score was low in 13(20.3%) babies of grandmultiparas and 11(16.5%) babies of multiparas with

$P = 0.0011$. In addition, there were higher cases of low birth weight ($P = 0.1613$), neonatal intensive care admission ($P = 0.7202$) and 5th minute Apgar scores ($P = 0.4778$) among grandmultiparas compared to multiparas although these were not statistically significant. Neonatal deaths were 5(7.8%) among grandmultiparas and 2(3.1%) among multiparas with $P = 0.4372$.

Table i: Antenatal parameters of grandmultiparas and multiparas

Parameter	Grandmultipara(n=64) Freq (%)	Multipara (n=64) Freq (%)	P value
GA at booking			
<20weeks	16(25.0)	33(51.6)	0.0202
>20weeks	48(75.0)	31(48.4)	
Mean	24.08±4.24	22.30±4.46	
Haemoglobin at booking			
<10g/dl	28(43.8)	13(20.3)	0.0024
=10g/dl	36(56.2)	51(79.7)	
Mean	9.70±1.08	9.95±0.73	
Medical disorders			
Chronic hypertension	5(7.6)	1(1.5)	0.2157
PIH	4(6.1)	3(4.5)	0.4761
Preeclampsia	3(4.5)	3(4.5)	0.6761
Diabetes mellitus	1(1.5)	0	NA
Previous poor perinatal outcome			
Yes	28(43.8)	14(21.9)	0.0124
No	36(56.2)	50(78.1)	0.0005
Antenatal vaginal bleeding			
Yes	5(7.8)	0	NA
No	59(92.2)	64(100)	0.0684

*GA: Gestational age

†PIH: Pregnancy induced hypertension

‡NA: not applicable

Table ii: Obstetric outcome among subjects and controls.

Parameter Freq (%)	Grandmultipara(n=64) Freq (%)	Multipara(n=64) Freq (%)	Chi square	P value
GA at delivery				
28-36weeks	16(25.0)	7(10.9)	4.26	0.0389
37-42weeks	46(71.9)	55(85.9)	4.53	0.0332
>42weeks	2(3.1)	2(3.2)	0.26	0.6116
Mean	37.30±2.90	38.41±2.60	5.21	0.0222
Hb at delivery				
<10g/dl	12(18.8)	3(4.7)	7.11	0.0076
>10g/dl	52(81.3)	61(95.3)	7.17	0.0075
Mean	10.14±1.29	10.74±0.71	6.31	0.0012
Onset of labour				
Induction	13(20.3)	8(12.5)	1.75	0.4159

Spontaneous	51(79.7)	56(87.5)	1.68	0.4026
Mean duration of labour	7.34±2.18	7.01±1.88	1.76	0.3532
Intrapartum complications				
Yes	38(59.4)	28(43.8)	2.32	0.2014
No	26(40.6)	36(56.2)	2.46	0.1171
Mode of delivery				
SVD	37(57.8)	42(65.6)	0.53	0.4649
Breech delivery	11(17.2)	7(10.9)	0.89	0.3448
Caesarean delivery	13(20.3)	13(20.3)	0.00	1.0000
Instrumental delivery	3(4.7)	2(3.2)	0.03	1.0000
PPH	18(28.1)	12(18.4)	1.55	0.2126
Blood transfusion	20(31.3)	13(20.0)	2.88	0.4108

*GA Gestational age

†SVD Spontaneous vertex delivery

‡PPH Postpartum haemorrhage

§ Hb Haemoglobin

Table iii: Neonatal outcomes in subjects and controls

Outcome	Grandmultipara Freq(%, n=64	Multiparas Freq(%, n=64	Chi square x ²	p-value
Birth weight(g)				
<2500	14(21.8)	8(12.5)	1.96	0.1613
2500-4000	47(73.5)	52(81.3)	1.10	0.2932
>4000	3(4.7)	4(6.2)	0.00	1.0000
Mean weight	2.98±0.76	3.07±0.65	0.54	0.4645
Apgar scores				
1 st minute: <4	13(20.3)	11(16.9)	13.57	0.0011
4-6	36(56.3)	18(27.7)	11.25	0.0008
> 7	15(23.4)	35(54.7)	15.66	0.0000
5 th minute: <4	12(18.8)	10(15.6)	1.48	0.4778
4-6	2(3.1)	5(7.8)	0.60	0.4373
>7	50(78.1)	49(76.6)	0.04	0.8335
Congenital abnormality	1(1.5)	1(1.5)	0.51	1.0000
Birth trauma	3(4.7)	4(6.2)	0.00	1.0000
NICU admission	27(42.2)	24(36.9)	0.13	0.7207
Stillborn	4(6.3)	3(4.6)	0.00	1.0000
Neonatal death	5(7.8)	2(3.1)	0.60	0.4372
Alive	55(85.9)	59(92.2)	1.28	0.2586

*NICU Neonatal Intensive Care Unit

Discussion

This study showed that the incidence of grandmultiparity was 4.1%; this was comparable to 4.2% in Lagos⁷ and 5.1% in Ile-Ife⁸ both in Nigeria and 5% in South Africa.⁹

Grandmultiparas had statistically higher rate of late antenatal booking and anaemia at booking as well as higher but not statistically significant occurrence of medical disorders in pregnancy. This corroborated reports of late antenatal booking from Enugu¹ and Benin city² in Nigeria where 77.35% and 64.45% of grandmultiparas booked after 20weeks of gestation. The late antenatal booking may be because they were overconfident having had may previous deliveries coupled with probable inability to afford medical care.

The obstetric outcome measures in grandmultiparas showed higher and statistically significant occurrence of preterm delivery and anaemia on presentation in labour; as well as higher cases of induction of labour, intrapartum complications, postpartum haemorrhage and blood transfusion though these were not statistically significant. The higher incidence of complications like obesity, hypertensive disorders in pregnancy and diabetes mellitus might explain the poorer outcomes observed among grandmultiparas in this study. The higher rate of postpartum haemorrhage and blood transfusion among grandmultiparas was similar to reports from many other studies.^{1,3,9-12}

Neonatal outcome measures showed that neonates of grandmultiparas had significantly higher cases of low

first minute Apgar scores as well as higher but not statistically significant cases of low birth weight, need for neonatal intensive care, stillborn and neonatal deaths. The higher incidence of neonatal complications was similar to report from a similar study in Reunion Islands; ¹³ this may be due to the effect of the medical disorders, anaemia and other complications among the grandmultiparas.

Grandmultiparas had a statistically significant higher incidence of previous perinatal complications which might be due to the common practice of delivery at home and religious homes where skilled birth attendants are usually unavailable. This was similar to report from Reunion Island where grandmultiparas have higher history of previous perinatal deaths. ¹³ Thus, there is a need for the attendance of skilled birth attendants at all deliveries for improved perinatal care and hospital delivery should be encouraged irrespective of parity, age or socioeconomic status.

Although grandmultiparas had poorer obstetric and neonatal outcome than multiparas, majority of these were not statistically significant. This improvement was due to effect of modern antenatal care received by these women. Reports from Nigeria ¹⁴, Libya ¹⁵, Nepal ¹⁶, Iran ¹⁷ and Jamaica ¹⁸ all clearly showed the evidence in improvement of pregnancy outcome in women who had modern antenatal care. Ekwempu in Zaria, Nigeria reported that booking status had a more positive impact on pregnancy outcome than educational status ¹⁴. Ziyo *et al* reported that antenatal care has a positive impact on mother and child's health ¹⁵, Tuladhar *et al* showed that maternal complications were more common without antenatal care ¹⁶ while Roohparvarzadeh *et al* documented that antenatal care resulted in improvement in child health indicators like stillborn and preterm births¹⁷. Young *et al* reported that even in adolescents who are known to be a peculiar high risk group, modern antenatal care resulted in minimal difference in pregnancy performance between adolescents and older women ¹⁸. The improvement in pregnancy outcome in grandmultiparas due to effect of antenatal care as demonstrated in this study was similar to the report of Ojenuwah³ who compared obstetric outcome in booked and unbooked grandmultiparas in Bida, North Central Nigeria. He reported that unbooked grandmultiparas had twice the risk of complications in labour with operative delivery being three times and other complications one and half times commoner when compared to their booked counterparts. ³ In the same study, unbooked grandmultiparas had increased risk of blood transfusion, longer hospital stay, more maternal deaths and three times higher perinatal mortality than the booked patients. Therefore, after correction for age and social class, modern antenatal care represents a major

factor in improving pregnancy outcome in grandmultiparas.

Conclusion / Recommendations

The result of this study showed that despite eliminating confounders (such as age and social status), grandmultiparity is still associated with poorer obstetric and neonatal outcome when compared to women with lower parity although most were not statistically significant. Modern antenatal care was the major factor in the improvement of pregnancy outcome in grandmultiparas.

The effect of the result of this study on patient care is that grandmultiparas still deserve a closer monitoring throughout pregnancy, labour and postpartum period.

With respect to policy formulation, public enlightenment to discourage the cultural desire for large family size should be vigorously pursued with greater efforts at women empowerment. In addition, antenatal care should be further encouraged and all deliveries should be conducted by skilled birth attendants so as to prevent perinatal complications as well as improving child survival.

Finally, contraception remains an important tool for limiting family size and efforts at improving availability, accessibility and uptake are worthwhile.

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