

# The Effect of Grandmultiparity on Pregnancy related complications: The Aga Khan University Experience

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## Abstract

**Background:** Grandmultiparity has been associated with complications for both mother and the let-us. Objective: To evaluate if grandmultiparity is a risk factor in the presence of adequate antenatal care.

Setting: A tertiary care teaching hospital.

**Methods:** It was a retrospective study conducted in the department of Obstetrics & Gynecology at The Aga Khan University Hospital in Karachi. During this period 9253 women were delivered, out of these 143 booked grandmultiparas (GMP) served as cases. The outcome of these women was compared with 430 nongrandmultiparas (NGMP). Logistic regression model was used to adjust for potential confounders.

**Results:** Grandmultiparas had almost three times increased risk of having postpartum hemorrhage compared to NGMP group. Similarly, there were significantly low five-minute apgars in the GMPs compared to the NCMP group. Although the neonatal intensive care admissions were three times more in the GMPs hut this did not reach statistical significance due to small number of cases in both groups.

**Conclusion:** Our study indicates that grandmultiparity is a risk factor for pregnancy in this part of the world, even in the presence of reasonable antenatal care. This may be explained on the basis of the increased age of these women. Finally, we also recommend that an age-matched study needs to be undertaken in order to determine if age is an important determinant for risk factors in grandmultiparas (ØPMA 50:54, 2000).

## Introduction

Grandmultiparity is the condition of giving birth after the 28th weeks of gestation, following 5 or more previous viable pregnancies. It was Solomon who coined the phrase “The Dangerous Multipara” in his paper in 1934<sup>1</sup>. He further added that, “it is a mistake to suppose that in child bearing, practice makes perfect”. Since then grandmultiparity has been considered as a risk factor for both mother and the fetus<sup>2-7</sup>.

The use of contraceptive and small family size has made the grandmultiparas a lost tribe in the Western World. The data is, therefore, sparse and hence grandmultiparity cannot be studied. However, grandmultiparity is still rampant in Pakistan among women of low socioeconomic class and in those, getting married at a younger age<sup>5</sup>. Other factors contributing to the prevalence of grandmultiparity are illiteracy, religious and cultural norms, which are a stumbling block to greater contraceptive use. The objective of this paper was to evaluate the effect of grandmultiparity on pregnancy related complications in the presence of adequate antenatal care based on our experience at the Aga Khan University Hospital (AKUH). This is a private tertiary care facility with modern obstetric and neonatal care. This facility caters to the higher socioeconomic strata therefore, provides an optimum environment to study the effects of grandmultiparity and its related complications in the relatively privileged population of Karachi.

## Material and Methods

This was a retrospective study conducted in the department of OBGYN at AKUH in Karachi, Pakistan, based on deliveries performed between January 1991 to November 1995. During this period 9253 patients were delivered. Out of these women, 206 were identified as grandmultiparas (GMP). 143 of these women were not only booked but also their complete notes were available, and they served as out case. For comparison purpose, a group of 430 booked women delivering during the same time period but with parity of less than five (0-4) were randomly selected, herein will be called the non-OMP group (NGMP). Booked status refers to women who had 3 or more antenatal visits.

A questionnaire was developed for this study. The information comprised of demographic variables including age, booking hemoglobin and antenatal complications. During pregnancy blood pressure of more than 140/90 on two or more occasions with or without proteinuria was taken as hypertension. Anemia was taken as hemoglobin of less than 11 grams. A glucose challenge test of 75grams was offered to all women at booking. A level of more than 140mgs warranted a glucose tolerance test. Preterm labor was defined as Labor starting before 37 completed weeks of gestation. During active phase of labor the event were noted on a partogram. Failure to progress was taken as any delay of cervical dilatation or descent of the presenting for more than two hours. Postpartum hemorrhage was taken as blood loss estimated to be more than 500mls.

The mode of delivery was also noted. Neonatal variables collected were Apgar scores, admission to the neonatal intensive care unit (NICU) and the occurrence of complications.

The data items were entered into a standard data base file. The Chi square test was used to compare categorical variables, while the "t" test was used for continuous variables, like age, birth weight etc. A multiple logistic regression model was used for multivariate analysis. Data was analyzed using the SPSS/PC statistical package.

## Results

The prevalence of grandmultiparity in our hospital population was 2.2%. The mean age of women in the GMP group was 33.8 years, which was significantly higher than that in the NGMP group of 27.8 years, ( $p < 0.00$ ) and 45.5% of women in GMP group were  $\geq 35$  years or more of age.

On analyzing antenatal complications, the mean hemoglobin in the OMP group was 10.97gms compared to 11.35gms in the NGMP group. This difference was statistically significant. ( $p < 0.002$ ) Hypertension was found in 15.4% (n=22) among the GMP group as compared to 9.3% (n=40) in the NOMP group. This difference was significant, ( $p < 0.04$ ). Also, a significant greater number of women in the GMP group had diabetes 16% (n=23) as compared to 5.8% (n=25) in the NOMP group, ( $p < 0.0001$ ).

Abruptio placentae occurred in 6.3% (n=9) of women in the OMP group but in only 0.9% (n=4) in the NOMP group. This difference was statistically significant, ( $p < 0.0002$ ) (Table I). Similarly, placenta previa was almost ten times more common among the GMPs occurring in 4.9% (n=7) of cases in comparison to 0.5% (n=2) in the NGMP group, ( $p < 0.0002$ ). (Table 1).

**Table 1. Percentage distribution and odds ratios of antenatal variables.**

Factors	Outcome				All		Odds Ratio (95% C.I)
	Case		Control		%	No.	
	%	No.	%	No.			
<b>Hypertension</b>							
Yes	15.4	22	9.3	40	10.8	62	1.773 (1.014, 3.100)
No	84.6	121	90.7	390	89.2	511	1
<b>Diabetes Mellitus</b>							
Yes	16.1	23	5.8	25	8.4	48	3.105 (1.701, 5.668)
No	83.9	120	94.2	405	91.6	525	1
<b>Abruptio Placentae</b>							
Yes	6.3	9	0.9	4	2.3	13	73153 (2.168, 23.599)
No	93.7	134	99.1	426	97.7	560	1
<b>Placenta Previa</b>							
Yes	4.9	7	0.5	2	1.6	9	11.015 (2.261, 23.651)
No	95.1	136	99.5	428	98.4	564	1
<b>Malpresentation</b>							
Yes	9.8	14	4.9	21	6.1	35	2.114 (1.045, 4.276)
No	90.2	129	95.1	409	93.9	538	1

Breech presentation occurred in about 7% in the OMP group as compared to 3% in the NOMP group. Also, transverse lie occurred in a 2.8% of cases in the GMP group. There was one case of face presentation in the NOMP group. When these malpresentation rates were analyzed individually, the numbers were too small to reach statistical significance. However, when they are added together they just reach statistical significance, ( $p < 0.04$ ) being more common in the multiparas. There was no statistical difference in the prevalence of normal deliveries and cesarean sections in the two groups. (Table 2).

**Table 2. Intra partum / postpartum events.**

Factors	Outcome				All		Odds Ratio (95% C.I)
	Case		Control		%	No.	
	%	No.	%	No.			
<b>Failure to Progress:</b>							
Yes	1.4	2	4.7	20	3.9	22	0.295 (0.068, 1.278)
No	98.6	139	95.3	410	96.1	549	1
<b>Normal Deliveries</b>							
Yes	70.6	102	68.8	297	69.6	399	1.09 (0.71, 1.68)
No	29.4	41	31.2	133	30.3	174	1
<b>Instrumental Deliveries</b>							
Yes	3.5	5	12.3	53	10.1	58	0.258 (0.101, 0.658)
No	96.5	138	87.7	377	89.9	515	1
<b>C. Section</b>							
Yes	25.2	36	18.6	80	20.2	116	1.45 (0.9, 2.32)
No	74.8	107	81.4	350	79.7	487	1
<b>Postpartum Haemorrhage</b>							
Yes	9.1	13	35.5	15	4.9	28	2.767 (1.283, 5.966)
No	90.9	130	96.5	415	95.1	545	1

Failure to progress in the first stage of labor was responsible for 1.4% (n=2) of cesarean sections in the GMP group while it occurred in 4.7% (n=20) in the NGMP group. This difference was not statistically significant. There were no maternal mortalities in the GMP group but one mortality occurred in the NGMP group; in a woman who had Eisenmenger's syndrome. Postpartum hemorrhage occurred in 9.1% of the GMP group (n=13) and in 3.5% (n=15) of the NOMP group. This difference was statistically significant ( $p < 0.009$ ).

The intrauterine death (IUD) rate was significantly different between the two groups. ( $p < 0.001$ ) These were 4.2% (n=6) and 0.9% (n=4) in the OMP and NGMP group respectively. Out of six intrauterine deaths in the GMP group, two were due to congenital malformations. i.e. one had pulmonary hypoplasia and absent kidney and the other had multiple congenital malformations. There was one case of cytomegalovirus infection. Severe PET and obstructed labor with transverse lie accounted for one case each. There was also one case of unexplained intrauterine death (IUD). In the NGMP group out of four IUDs, two were due to congenital abnormalities. While the other two were intrapartum stillbirths in women because of complicated breech deliveries. However, the neonatal mortality rate was not statistically different in the two groups probably because the numbers were too small (Table 3).

**Table 3. Prinatal outcome.**

Factors	Outcome				All		Odds Ratio (95% C.I)
	Case		Control		%	No.	
	%	No.	%	No.			
Birth Weight (mean ± SD)	3.11	0.63	3.01	0.53	P = 0.07		
Apgar Score at 5 Minutes							
<7	4.9	7	1.6	7	2.4	14	3.110 (1.0719, 0.0252)
≥7	95.1	136	98.4	423	97.6	559	1
SD							
Yes	4.2	6	0.9	4	1.8	10	4.631 (1.288, 16.653)
No	95.8	137	99.1	423	98.2	560	1
NICU							
Yes	23.8	34	8.4	36	12.3	70	3.388 (0.025, 5.668)
No	76.2	109	91.6	391	87.7	500	1
Neonatal Jaundice							
Yes	27.3	39	27.6	118	27.3	157	1.9 (1.2, 2.9)
No	72.7	104	72.4	312	72.3	416	1
Sepsis							
Yes	9.8	14	6.3	27	7.2	41	1.9 (1.0, 3.9)
No	90.2	129	93.7	403	92.8	532	1
RDS							
Yes	3.5	5	1.9	8	2.3	13	9.6 (2.9, 31.7)
No	96.5	138	98.1	422	97.7	557	1

The mean birth weight was 3.01kg in the GMP group and 3.11kg in the NGMP group. This difference was not statistically significant, (Table 3). There was no statistical difference in the prevalence of respiratory distress syndrome, sepsis or neonatal jaundice in the two, groups. (Table 3). Apgar scores of less than 7 at five minutes were found to be significantly more ( $p < 0.001$ ) 4.9% (n=7) among the babies born to the women in the GM? group as compared to the NGMP group 1.6% (n=7).

A multiple logistic regression, model was used to adjust for potential confounders. The adjusted odds ratio indicate that the women in the GMP group, was three times more likely to experience postpartum hemorrhage than the NGMP group. Although GMPs are at 46% more risk of Cesarean Section as compared to the NGMP group, but this difference did not reach statistical significance. The OMP group also had a three times higher risk for low Apgar scores (<7 at 5 min.) as compared to the NGMP group, in the presence of other variables in the model.

NICU admissions were three times more common in the GMP group when compared to the NGMP

group, but the wide confidence intervals of this result was because of a relatively small number of cases in the two groups.

## Discussion

The prevalence of grandmultiparity in our study population was 2.2%, while it has been reported by Karim et al as 28.7% in their data from the Civil Hospital, Karachi<sup>5</sup>. The difference can be due to the fact that our study was conducted at a private tertiary care facility that caters for a higher socioeconomic group. On the other hand, this disparity could also be due to the 13 years interval between the two studies. In addition, all of our patients had three or more antenatal visits. Whereas, the study conducted by Karim et al<sup>5</sup> in this region did not take booking status of socioeconomic factors into account when analyzing their data and only 20% of their women received any antenatal care and the majority of them were also from a low socioeconomic class.

As expected the mean age of the GMP group was significantly higher than that of the NGMP group. Similarly, a higher prevalence of anemia was observed, among the women in the GMP group. Other authors have reported this from Pakistan<sup>5</sup>.

The prevalence of hypertension and diabetes was also found to be higher in the OMP group in this study. The higher prevalence of these complications may be explained on the increased age of these women<sup>4-6</sup>. It would have been preferable if we had controlled for age when designing the study, for in part it may explain the different occurrence rate of complications like hypertension.

There were no maternal deaths in the GMP group but one in the NGMP group (mortality rate, 0.1 per 1000). Karim et al<sup>5</sup> reported that this rate was about 8 per 1000 in the GMP group and 7 per 1000 in the NGMP group. The low maternal mortality in our study can be explained by the fact that our patients had more antenatal care, they were from a higher socioeconomic strata and also there is a thirteen years time difference between the two studies.

Regarding the mode of delivery there was no significant difference found in the prevalence rate of cesarean section or normal deliveries in the two groups. Contrary of this finding, some authors have noted an increased cesarean section rate among GMPs<sup>4-6,13</sup>. However, it was interesting to observe a significantly lower rate of instrumental delivery in the GMP group. While others have reported an increase in this rate<sup>4</sup>. Perhaps the lower rate in the AKU group was due to a cautious attitude of Obstetricians towards the women in the GMP group and because most grandmultiparous women with failure to progress in second stage of labor had a cesarean section rather than risking a difficult instrumental delivery. The difference in the cesarean section rate was not found to be significant when logistic regression analysis was applied.

The neonatal data revealed significantly lower mean Apgar scores in the newborns of the GMP group when compared to the NGMP group, and there was a higher rate of NICU admissions in the GMP group. This finding has not been reported by others<sup>4,11</sup>. Postpartum hemorrhage was three times more common among GMP's compared to NOMP's. Others have also reported an increased rate of PPH amongst grandmultiparas<sup>5,6</sup>.

The study concluded that grandmultiparity is a risk factor for pregnancy in this part of the world, even in the presence of reasonable antenatal care. This may be explained on the basis of the increased age of these women. An age matched study needs to be undertaken to determine the importance of age as a risk factor in grandmultiparas.

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