PERINATAL JOURNAL

Research Article
Perinatal Journal 2013;21(1):17-22

The effect of grand multiparity on maternal, obstetric, fetal and neonatal outcomes

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Abstract

Objective: Our aim was to compare maternal obstetric, fetal and neonatal outcomes between grand multipara and primipara women.

Methods: A retrospective case control study was conducted in Gynecology and Obstetric Clinic of Izmir Atatürk Training and Research Hospital between January 01, 2008 and January 01, 2010. Seventy-two grand multipara women were compared with 513 primipara women who delivered during the same period. The data were obtained from the hospital medical records. Antepartum, intrapartum and neonatal features were compared between the two groups.

Results: Grand multipara women were older, married earlier, received lesser antenatal care, and had more stillbirth, twin and preeclampsia history compared to the primipara. In the current pregnancy, preeclampsia, post partum hemorrhage, fetal distress were more encountered in the grand multipara women than primipara. The infants of the grand multipara had lower birth weight and much more needs to have neonatal intensive care than primiparas'.

Conclusion: Grand multiparity is found to be a risk factor only for postpartum hemorrhage when confounding factors are eliminated.

Key words: Grand multiparity, postpartum hemorrhage, antenatal care, pregnancy outcomes.

Grandmultiparitenin maternal, obstetrik, fetal ve neonatal sonuçlara etkisi

Amaç: Grandmultipar ve primipar kadınlarda maternal obstetrik, fetal ve neonatal sonuçların karşılaştırılması amaçlandı.

Yöntem: İzmir Atatürk Eğitim ve Araştırma Hastanesi, 1. Kadın Hastalıkları ve Doğum Kliniğinde 1 Ocak 2008 ile 1 Ocak 2010 tarihleri arasında geriye dönük olgu kontrol çalışması düzenlendi. Yetmiş iki grandmultipar kadın aynı tarihlerde doğum yapan 513 primipar kadın ile karşılaştırıldı. Veriler hastane kayıtlarından elde edildi. İki grubun doğum öncesi, doğum ve yenidoğanla ilgili özellikleri karşılaştırıldı.

Bulgular: Grandmultipar kadınlar primiparlar kadınlara göre daha yaşlı, daha erken evlenmiş, gebelikte daha az bakım almış, daha fazla ölü doğum, ikiz gebelik ve preeklampsi öyküsüne sahipti. Grandmultiparlar şimdiki gebeliklerinde primiparlardan daha sık preeklampsi, doğum sonu kanama, fetal distres ile karşı karşıya kalmakta idi. Grandmultipar kadınların yenidoğan bebekleri primiparlardan daha düşük doğum kilolu ve daha fazla yenidoğan yoğun bakım ihtiyacı göstermekteydi.

Sonuç: Kafa karıştırıcı faktörler ayıklandığında, grandmultiparite sadece doğum sonu kanama için risk faktörü olarak saptanmıştır.

Anahtar sözcükler: Grandmultiparite, doğum sonu kanama, doğum öncesi bakım, gebelik sonuçları.

Introduction

Grand multiparity is defined as parity more than or equal to five previous births. It has been described as an independent risk factor for antepartum, intrapartum and neonatal complications.[1,2] The more prevalent pregnancy complications of grand multipara include diabetes mellitus, hypertension disorders of pregnancy, preterm labor, malpresentation, postpartum hemorrhage and perinatal mortality. In developed countries grand multiparity is uncommon mostly due to sociocultural factors, wide spread practice of family plan-

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Received: December 29, 2012; **Accepted:** February 2, 2013

Available online at:
www.perinataljournal.com/20130211012
doi:10.2399/prn.13.0211012
QR (Quick Response) Code:

ning, and improved health services.[3,4] Some studies stated that the prevalence of antepartum complications in the grand multipara was not different from that of other multiparas,[2,4] the others drew attention the relation between grand multiparity and low socioeconomic conditions.[5]

The objective of this study was to compare the incidence of antepartum, intrapartum and neonatal complications between the grand multipara and primipara women.

Methods

A retrospective study was conducted by examining the records of pregnant women who gave birth in Gynecology and Obstetric Clinic of Izmir Atatürk Training and Research Hospital, between January 01, 2008 and January 01, 2010. The data was obtained from the hospital medical records. During the study period, the grand multipara delivering after 22 weeks of gestation were included in the study. The control group was composed of primipara women who attended and delivered during the same period. Age, marriage age, and status of antenatal follow-up were recorded as demographic data, and absence of health insurance or existence of green health card was used as low socioeconomical level indicator.

Obstetric medical history including congenital anomaly, in utero mort fetalis (IUMF), twin pregnancy, preeclampsia, gestational diabetes, placenta previa and family history including diabetes mellitus and hypertension were enrolled. Antepartum complications including preeclampsia, gestational diabetes, anemia, placenta previa, placental detachment, polyhydramnios, oligohydramnios, IUMF, twin pregnancy and intrapartum data including gestational age at birth, labor induction, non-vertex presentation, preterm labor, placenta accreta, primary cesarean section, fetal distress, postpartum hemorrhage were enrolled. Preeclampsia was diagnosed when a pregnant woman develops high blood pressure (two separate readings taken at least six hours apart of 140/90 or more) and 300 mg of protein in a 24-hour urine sample. Anemia was defined as the hemoglobin level less than 10 mg/dL. However postpartum hemorrhage was defined as the loss of 500 ml of blood or more within 24 h of delivery, the subjective assessment records has been reached retrospectively. Low birth weight is defined as weight of less than 2500 g, irrespective of gestational age. Fetal weight, 1st minute Apgar score, shoulder dystocia, neonatal intensive care need, and intrauterine growth restriction were recorded as neonatal data.

Statistical analysis was carried out using SPSS 11.0 for Windows (SPSS Inc., Chicago, IL, USA) statistical software. Categorical variables were described using frequency distribution and compared by chi-square and Fisher's exact test. For continuous variables, descriptive statistics were calculated and reported as mean±standard deviation. Student-t was used to compare mean scores of continuous variables between two groups. A p value of less than 0.05 was considered statistically significant. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were computed by logistic regression for the risk of the following outcomes of interest: (a) preeclampsia, (b) fetal distress, (c) postpartum hemorrhage, (d) low birth weight, and (e) neonatal intensive care need. Potential confounders were included in the full model if they were risk factors for outcomes of interest. These covariates included grand multiparity, age, absent of antenatal care, and absent of health insurance.

Results

There were 7055 births in Gynecology and Obstetric Clinic of İzmir Atatürk Training and Research Hospital during the study period. Seventy two of them were grand multipara and 513 of them were primipara (second gravidas with previous one delivery) women.

The comparison of demographic data, medical and family history between the grand multipara and primipara women are summarized (**Table 1**). The grand multipara women were older and married earlier than primipara. Lack of antenatal care and absence of health insurance were more prevalent in the grand multipara than primipara. The grand multipara cases had more prevalent history of stillbirth, twin pregnancy and preeclampsia than primipara cases.

Antenatal, intrapartum and neonatal complications of the grand multipara and primipara women are compared (**Table 2**). In the current pregnancy, preeclampsia, postpartum hemorrhage and fetal distress occurred much more in the grand multipara than primipara. The infants of the grand multipara cases had lower birth weight than ones' delivered by primipara cases. Additionally the necessity to neonatal intensive care need was more prevalent in the infants of grand multipara than primipara. No maternal and fetal deaths were recorded in the study and control groups.

Table 1. Characteristics of primipara and grand multipara women.

	Primipara	Grand multipara	P value
Demographic data			
	Mean±SD	Mean±SD	
Age	27.74±4.83	35.67±2.93	<0.001*
Marriage age	20.56±3.63	13.31±3.68	<0.001*
	Number (Percent)	Number (Percent)	
Lack of antenatal care	87 (17.0%)	23 (31.9%)	0.002†
Absence of health insurance	96 (18.7%)	29 (36.7%)	<0.001†
Medical History			
Congenital anomaly	5 (1.0%)	2 (2.8%)	0.209‡
Stillbirth	11 (2.1%)	13 (18.1%)	<0.001†
Twin pregnancy	4 (0.8%)	3 (4.2%)	0.043‡
Preeclampsia	31 (6.0%)	11(15.3%)	0.004‡
Gestational diabetes	20 (3.9%)	5 (6.9%)	0.218†
Placenta previa	7 (1.4%)	2 (2.8%)	0.306‡
Family history			
Diabetes mellitus	72 (14.0%)	9 (12.5%)	0.724†
Hypertension	71 (13.8%)	6 (8.3%)	0.421†

*Student-t test; †Chi-square test; ‡Fischer's exact test

The covariates included grand multiparity, age, lack of antenatal care, and absent of health insurance for outcomes of interest were summarized (**Table 3**). After controlling for age, lack of antenatal care and absence of health insurance, the grand multiparity is associated with an increased risk of postpartum hemorrhage.

Discussion

Izmir Atatürk Training and Research Hospital is one of the tertiary care centers in the third biggest city of Turkey. The population of the study consisted of different ethnic identities and nearly all of them were Muslims. The prevalence of the grand multiparity was found 1.02%. The overall incidence of grand multiparity ranged from 0.6 to 30% with higher rates in Muslim countries where is of large family norm and poor acceptance of family planning methods.[6]

In our study, the grand multipara women were older than primipara. The prevalence of complications associated with grand multiparity including malpresentation, placenta previa, postpartum hemorrhage, and preeclampsia were known to increase with maternal age.[6-8] Maternal age seem to effect as confounding factor on the association between grand multiparity and adverse maternal outcome. The study from Utah noted that, in young women, grand multiparity was not an independent risk factor for most adverse intrapartal and newborn complications but decrease risk for many complications.[9] Grand multipara women married earlier, associated with social and economic conditions of the population, than primipara women.

The association between grand multiparity and pregnancy outcomes has been studied in different setting of economic, literacy, ethnic, religious, cultural and social backgrounds and quality of obstetric services.[10] Absence of health insurance or existence of green health card was used as low socioeconomical level indicator. Many trials noted that low socioeconomic conditions was associated to grand multiparity.[5,11] Grand multipara women were taken lesser antenatal care than primipara; it may also be related to low socioeconomic status. Grand multipara women would not take advantage of antenatal care because they take pregnancy for granted and this condition puts them at higher risks of obstetric complications.[12] Lack of antenatal care is reported in most of the studies on the association between grand multiparity and pregnancy outcomes, and it was explained by the observation that grand multipara women who have had no problems in previous

Table 2. Antepartum, intrapartum and neonatal complications of primipara and grand multipara women.

	Primipara	Grand multipara	P value
Antepartum	**Number (Percent)**	**Number (Percent)**	
Preeclampsia	29 (5.7%)	15 (20.8%)	**<0.001***
Gestational diabetes	20 (3.9%)	5 (6.9%)	0.218†
Anemia	215 (41.9%)	37 (46.8%)	0.410*
Placenta previa	7 (1.4%)	2 (2.8%)	0.306†
Placental detachment	12 (2.3%)	1 (1.4%)	1.000†
Polyhydramnios	6 (1.2%)	-	1.000†
Oligohydramnios	10 (1.9%)	4 (5.1%)	0.103†
Stillbirth	8 (1.6%)	3 (4.1%)	0.147†
Twin pregnancy	6 (1.2%)	1 (1.3%)	1.000†
Intrapartum	**Mean±SD**	**Mean±SD**	
Gestational age at birth	38.52±2.29	38.42±2.92	0.776‡
	Number (Percent)	**Number (Percent)**	
Labor induction	97 (18.9%)	11 (15.3%)	0.457*
Non-vertex presentation	26 (5.1%)	8 (10.1%)	0.112†
Preterm labor	75 (14.6%)	6 (8.3%)	0.148*
Placenta accrete	4 (0.8%)	-	1.000†
Primer cesarean section	282 (55.0%)	42 (53.2%)	0.764*
Fetal distress	21 (4.2%)	8 (11.4%)	**0.017**†
Postpartum hemorrhage	6 (1.2%)	5 (6.9%)	**0.006**†
Neonatal	**Mean±SD**	**Mean±SD**	
Fetal weight	3237.37±625.17	3057.11±768.42	0.050‡
Apgar score	8.33±1.61	8.03±2.06	0.140‡
	Number (Percent)	**Number (Percent)**	
Shoulder dystocia	5 (1.0%)	-	1.000†
Neonatal intensive care need	37 (7.3%)	11 (14.5%)	**0.035***
Macrosomia	26 (5.1%)	5 (6.6%)	0.584†
Meconium aspiration	25 (5.0%)	3 (3.9%)	1.000†
Intrauterine growth restriction	29 (5.7%)	2 (2.6%)	0.410†

*Chi-square test; †Fischer's exact test; ‡Student-t test

pregnancies often delay seeking medical care. Further, women in this category find it difficult to attend clinics due to the time constraints imposed by their large demanding families.[3,12]

In our study, stillbirth and IUMF rates were significantly higher in grand multipara women both in their medical history and in current pregnancies. Most of the studies, like ours, noted that stillbirth was more common in grand multipara, associated to socioeconomic status and less antenatal care and squalidness.[1,3,5,6,9,13,14] On the other hand, some of the authors found no difference in stillbirth rates between grand multipara women and lower parity groups.[4,6]

This study showed that the incidence of gestational diabetes was more common in grand multipara women, but the difference was not significant statistically. Most of the investigations revealed that gestational diabetes and macrosomia were more common in the grand multipara women especially related to maternal age.[6,14] It was suggested that the incidence of low birth weight babies were seen to be higher in the second gravidas than in the grand multiparas.[15] In our

Table 3. The covariates included grand multiparity, age, absent of antenatal care, and absent of health insurance for outcomes of interest.

Variables	Odds ratio	Confidence interval 95%	P value
Preeclampsia			
Grand multiparity	1.25	0.53-2.96	0.613
Lack of antenatal care	2.23	1.10-4.62	0.028
Age	1.16	1.10-1.24	<0.001
Absent of health insurance	1.08	0.51-2.33	0.837
Fetal distress			
Grand multiparity	1.42	0.49-4.13	0.521
Lack of antenatal care	1.51	0.63-3.64	0.357
Age	1.08	1.01-1.17	0.031
Absent of health insurance	1.19	0.49-2.89	0.696
Postpartum hemorrhage			
Grand multiparity	7.29	1.47-36.27	0.015
Lack of antenatal care	0.70	0.14-3.44	0.659
Age	0.99	0.87-1.12	0.859
Absent of health insurance	0.97	0.24-3.97	0.968
Low birth weight			
Grand multiparity	1.72	0.68-4.34	0.253
Lack of antenatal care	1.27	0.64-2.49	0.495
Age	0.97	0.91-1.03	0.263
Absent of health insurance	1.50	0.79-2.85	0.214
Neonatal intensive care need			
Grand multiparity	2.13	0.84-5.38	0.110
Lack of antenatal care	1.40	0.69-2.87	0.346
Age	0.99	0.93-1.05	0.737
Absent of health insurance	1.11	0.54-2.28	0.770

study, low birth weight babies were more prevalent in grand multipara, but the difference was not found statistically significant after the impacts of factors such as age, absence of antenatal care, and low socioeconomical conditions are ruled out. Preeclampsia, postpartum hemorrhage and fetal distress were more common in grand multipara cases than primipara cases. Preeclampsia was seen in both obstetric medical histories and current pregnancies of grand multipara cases. This shows the importance of antenatal care.

Concerning hypertensive disorders of pregnancy, a tendency toward a higher rate of pregnancy induced hypertension was observed, but chronic hypertension and preeclampsia rates were comparable in accordance with previous studies that also did not ignore the age factor.[12,16] The study performed in a socioeconomically stable community with free access to medical care revealed that mean diastolic blood pressure was slightly elevated among the grand multipara women than the control group.[13] We observed that preeclampsia was more prevalent in both obstetric medical history and current pregnancies of the grand multipara women. However, there was no effect of grand multiparity on preeclampsia after ruling out the impacts of the factors such as age, absence of antenatal care, and low socioeconomical level.

Postpartum hemorrhage takes part in literature as a very common complication among grand multipara women[3,6,14,15] and grand multiparity is the predominant risk factor for postpartum hemorrhage.[6,15] In our study, grand multiparity was found as an independent risk factor for postpartum hemorrhage. The infants of our grand multipara women have had lower birth weight. Additionally, fetal distress was significantly more common in grand multipara women and much more needs to have neonatal intensive care were found

in the grand multipara women than primipara. Most of the published papers addressed the greater risk of intensive care need in the babies of grand multipara women.[6] Grand multiparity was reported to be associated with a higher risk of cesarean section rate.[17] The rate of cesarean section was found as high in both groups. The reason of high cesarean section rate in our hospital might be related with being a tertiary and referral hospital. In our country grand multipara women mostly have illiteracy, squalidness, nutrition disorder depends on low socioeconomic conditions, and unfortunately they cannot find chance to take optimal antenatal care. This study, performed in the city where grand multiparity is less prevalent, the rates of preeclampsia, fetal distress, postpartum hemorrhage, low birth weight and neonatal intensive care need seem to be higher incidence in the grand multipara, but according to logistic regression analysis, grand multiparity is a risk factor only for postpartum hemorrhage.

Conclusion

The newer publications from developed countries reported better obstetric outcomes associated with grand multiparity. Most of the adverse outcomes that have been associated with grand multiparity may actually be confounded by advanced age, less antenatal care and low socioeconomic level. When confounding factors are eliminated, grand multiparity is seemed the risk factor for only postpartum hemorrhage.

Conflicts of Interest: No conflicts declared.

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