ORIGINAL PAPER

doi: 10.5455/medarh.2019.73.92-96
MED ARCH. 2019 APR; 73(2): 92-96
RECEIVED: JAN 12, 2019 | ACCEPTED: MA1R 10, 2019

Effect of Grand Multiparity on Pregnancy Outcomes in Women Under 35 Years of Age: a Comparative Study

Mohamed Alkhatim Alsammani[1], Athar Mohieldin Jafer[2], Sumeya A. Khieri[2], Ali Osman Ali[1], Mohamed Abdelgadir Shaaeldin[2]

[1]Obstetrics and Gynecology, College of Medicine, Qassim University, Buriadah, Saudi Arabia
[2]Department of Obstetrics and Gynecology, University of Bahri, Khartoum, Sudan

Corresponding author: Mohamed Alkhatim Alsammani. Department of Obstetrics and Gynecology, College of Medicine, Qassim University, Buriadah, Saudi Arabia. ORCID ID: http//www.orcid.org: 0000-0000-0000-0000.

ABSTRACT

Introduction: It is known for many years, that grand multiparity is associated with poor pregnancy outcome with or without considering increasing maternal age. **Aim:** To examine the impact of grand multiparity on pregnancy outcome in young women aged 18–34 years (Young grand multiparas). **Material and Methods:** A prospective comparative cross-sectional study conducted at Omdurman Maternity Hospital, Sudan from January to September 2018. A standard questionnaire was used to gather data on pregnancy outcome in the low-risk group, grand multiparas age < 35 years and grand multiparas age ≥ 35 years. The association between variables was tested with Chi-square test. **Results:** Young grand multiparas have a significant risk of PPH and increased length of hospital stay => 3 days and babies born to young grand multiparas women were more likely of low birth weight and have a higher rate of admission to NICU. Young grand multiparas were similar in their maternal and fetal complication to low-risk pregnancies and significantly less in several complications when compared to older grand multiparas women. **Conclusion**: Young grand multiparas are less likely to develop several pregnancy complications compared to older grand multiparas women. The occurrences of intra-partum complications match that in low-risk pregnancy.

Keywords: grand multiparity, neonatal complications, maternal complications, parity outcome, maternal age.

1. INTRODUCTION

The concept of grand multiparity was introduced during the last century. Numerous studies have described grand multiparity as an independents risk for many maternal and fetal complications (1, 2, 3). Grand multiparity is defined delivery of > four births after fetal viability (3, 4).

The incidence of grand multiparity is very high in developing countries compared to developed countries due to many factors and it varies between 2-4% in developed countries whereas in developing countries it is as high as 18.5% (5). Numerous studies have explored the impact of grand multiparity on a fetal and maternal outcome. Results of these studies were mixed. Some studies concluded that grand multiparity is a great risk for many fetal and maternal complications including abnormal placentation, abruption placenta, malpresentation, and interventional delivery, and postpartum hemorrhage, prematurity, and neonatal and maternal admission to intensive care unit admission (6, 7).

On the other hand, other studies demonstrated only a few of these complications among high parity (8, 9).

A previous literature concluded that grand multiparity is a risk factor for negative pregnancy outcomes without considering the increasing maternal age which was investigated in other studies and found to be an independent risk factor for poor outcome (10). Maternal age is an important variable that influences both the dependent variable and independent variable when assessing parity. In many regions particularly Arab countries in which one in seven girls marries before her 18th birthday. This may contribute to the increasing prevalence of high parity at younger age group.

2. AIM

The aim of this study was to investigate pregnancy outcome in grand multiparas women < 35 years of age by comparing pregnancy outcome to grand multiparas age ≥ 35 years and low parity (parity 1).

3. PATIENTS AND METHODS

This is a prospective comparative cross-sectional study conducted at Omdurman Maternity Hospital, Sudan from January to September 2018. The study was approved by Sudanese specialization board for obstetrics and Gynecology and Omdurman maternity Hospital Omdurman, Sudan.

Ethical considerations: The study was approved by the Ethics committees of the Sudanese specialization board and the Omdurman Maternity Hospital. Informed verbal consent to participate in the study was obtained from each woman

Inclusion/exclusion criteria were: all singleton low parity (Para I), grand multiparity age < 35 and grand multiparity age ≥ 35 years. The exclusion criteria were patients with multiple gestations, medical problems such as diabetes and hypertension, previous interventional delivery, women younger than 18 years and patients who were not willing to participate. Grandmultiparity is defined delivery of more than five births after fetal viability (3).

Literature defined advanced maternal age often as maternal age ≥ 35 years because of increased many pregnancy complications. Low parity is defined as parity 1 -4 (the delivery of the second to the fourth baby) (11). In the present study, we used parity 1, as a reference category.

The sample size was computed using OpenEpi: Open Source Epidemiologic Statistics for Public Health, Version. www.OpenEpi.com, updated 2013/04/06, accessed 2018/12/04. The incidence in a neighboring country was 8%, to avoid having smaller sample size we used a previously published data that quoted an incidence of 15%. The Minimum required sample size was 196 with 10% non-responding rate making the desired sample size of 216.

Demographic data including age, parity, occupation, education booking and regularity of the antenatal care were recorded. The outcomes variables of interest were fetal and maternal complications. Maternal complications we assessed included the mode of delivery, PPH, infection, hysterectomy, ruptured uterus, abruption placenta, premature delivery, cord prolapse, genital tract injury, admission to ICU, blood transfusion, maternal death, and hospital stay => 3 days. Fetal complications assessed were Apgar score< 7 at five minutes, birth weight, FSB, fetal distress, birth trauma, congenital anomalies, and fetal macrosomia.

Statistical analysis

Data were analyzed using Statistical Package for Social Science (SPSS, version 20.3) software. The categorical variables association was calculated using chi-square. A p value of less than 0.05 was considered statistically significant.

4. RESULT

Overall, 623 participants were recruited and divided into *3* groups according to their age and parity, 1) Group1 comprised 216 participants all were Para 1 as low-risk group (reference category), 2) Group composed of 210 participants and all were grand multiparas under 35 years of age and 3) Group 3, composed of 197 participants and were grand multiparas ≥ 35 years of age. Some selected demographic factors, intrapartum fetal

characteristics	G1 (n=216)	G2 (n=210)	G3 (n=197)	p value		
				G1 vs. G2	G1 vs. G3	G2 vs. G3
education						
Illiterate	12(5.6)	13(6.2)	51(25.9)	0.9545	0.0001	0.0001
Primary	53(24.5)	47(22.4)	66(33.5)	0.6814	0.3611	0.016
Secondary	68(31.5)	61(29.)	61(31.0)	0.6591	0.6591	0.753
University	75(34.7)	77(36.7)	19(9.6)	0.7507	<0.001	<0.0001
graduates	8(3.7)	12(5.7)	0(0.0)	0.4522	0.01777	0.01777
occupation						
Housewife	155(71.8)	141(67.1)	140(71.1)	0.3528	0.9627	0.2492
Self-employed business	26(12.0)	34(16.2)	24(12.2)	0.3290	0.9158	0.3126
Free business	13(6.0)	12(5.7)	11(5.6)	0.942	0.9825	0.8746
Laborer	22(10.2)	22(10.2)	22(11.2)	0.8034	0.6361	0.9484
Booking						
booked	194(89.8)	178(84.8)	139(70.6)	<0.001	<0.001	P <.001
unbooked	22(10.2)	32(15.2)	58(29.4))	0.1553	P <.001	P <.001
			Antenatal care (at least one visit)			
yes	166(85.6)	141(79.2)	111(79.9)	0.034	0.0001	0.03238
NO	28(14.4)	37(20.8)	28(20.1)	0.2302	0.9758	0.4226
Gestational age						
<37weeks	2(0.9)	2(.05)	5(2)	0.6354	0.3756	0.3963
37-39 weeks	204(73.6)	185(73.6)	175(73.6)	0.03121	0.05833	0.9383
> 41 weeks	10(73.6)	23(73.6)	17(73.6)	0.02386	0.1491	0.5352

Table 1. Distribution of basic characteristics between groups by Parity and Age. Values are given as number (percentage). Abbreviations: G1 , Para ; G2, Grand multipara < 35 years; G3, Grand multipara ≥35 years, Statistical significant at p-value <0.05

Complications	G1 (n=216)	G2 (n=210)	G3 (n=197)	p-value		
				G1 vs. G2	G1 vs. G3	G2 vs. G3
C/S	39(18.1)	37(17.6)	93(47.2)	0.9929	<0.0001	<0.001
Assisted VD	11(5.1)	19(9)	32(16.2)	0.1599	*P* <.001	0.04119
any maternal complications	7(3.2)	20(9.5)	53(26.9)	0.01381	*P* <.001	<0.001
PPH	7(3.2)	18(8.6	27(13.7	0.03283	*P* <.001	0.1873
Infection	0(.5)	-	2(1.0)	0.5220	0.7086	0.7114
Hysterectomy	0(.5)	1(0.5	1(0.5)	0.9887	0.9632	0.5068
Rupture uterus	0(.5)	2(1.0	3(1.5)	0.4661	0.2153	0.9820
Abruption placenta	1(.5)	1(0.5	6(3)	0.4909	0.09910	0.1072
Premature delivery	1(.5)	1(0.5	6(3)	0.4909	0.1072	0.09910
Cord prolapse	0	0	1(0.5)	-	0.9764	0.7120
Genital tract injury	1(.5)	1(0.5	8(4.1)	0.4909	0.03047	0.03397
admission to ICU	2(0.9)	6(2.9)	13(6.6)	0.2676	0.004883	0.1204
Blood transfusion	2(0.9)	6(3.8)	29(14.7	0.2676	*P* <.001	*P* <.001
maternal death	(.5)	-	1(0.5)	-	-	0.7114
hospital stay => **3days**	6(2.8)	31(14.7)	48(24.4)	*P* <.001	*P* <.001	0.02020

Table 2. Comparison of Maternal Complications between Young, Older Grandmultiaprity and Low Risk Women. Values are given as number (percentage). Abbreviations: G1 , Para ; G2, Grandmultipara < 35 years; G3, Grandmultipara ≥35 years, Statistical significant at p-value <0.05

characteristics	G1 (n=216)	G2 (n=210)	G3 (n=197)	p-value		
				G1 vs. G2	G1 vs. G3	G2 vs. G3
Fetal complications	27(12.5)	34(16.2)	73(37.1)	0.7008	*P* <.001	*P* <.001
Apgar Score< 7 at five minutes	9(4.4)	20(9.5)	37(18.8)	0.04525	*P* <.001	0.01088
birth weight < 2.5 kg	8(3.7)	21(10)	37(18.8)	0.01698	*P* <.001	0.01681
FSB	0(0)	1(0,5	6(3)	-	0.1072	0.1072
Fetal Distress	26(12)	28(13.3)	35(17.8)	0.7976	0.1336	0.2731
Birth trauma	0(0)	1(o,5)	8(4.1)	0.9887	0.008454	0.03397
Congenital anomalies	0(0)	1(0,5)	12(6.1)	0.9887	0.001072	0.003309
Sizeable baby	1(.5)	4(1.9)	11(5.6)	0.3516	0.005089	0.08812
NICU	11(5.1)	27(12.9)	44(22.3)	0.008268	*P* <.001	0.01697

Table 3. Comparison of Neonatal Complications between Young, Older Grandmultiaprity and Low Risk Women. Values are given as number (percentage). Abbreviations: G1, Para; G2, Grandmultipara < 35 years; G3, Grandmultipara ≥35 years, Statistical significant at p-value <0.05

and maternal complications were compared between these three groups.

There were no significant differences between the three groups in occupation and gestational age at delivery, and the incidence of preterm labor (p>0.05). Compared to low-risk multiparas, young grand multiparas aged (< 35 years), were less likely to be booked and inadequately attended the antenatal care and to have prolonged pregnancy (p<0.05). When older grand multiparas aged (≥35 years) were compared to low-risk they were more likely to be illiterate and less likely to go to college in their education, booked and inadequately attended the antenatal care (p<0.05) (Table 1).

With regards to intrapartum maternal complications, the rate of cesarean delivery and assisted vaginal delivery were significantly higher among older grand multiparas women, while the rate of this complication was similar in both younger grand multiparas and women of lower parity. The rate of many complications including infection, hysterectomy, ruptured uterus, abruption placenta, premature delivery, cord prolapsed and maternal death were all similar among all groups.

When compared with women of lower parity, PPH was significantly higher among both young and older grand multiparas women.

Genital tract injury, admission to Intensive care unit and blood transfusion were significantly more common among older grand multiparas compared to both young grand multiparas and low-risk group, while there was no significant increased risk for such complication when a comparison was made between a low-risk group and young grand multiparas women. The significantly increased risks remained when low-risk mothers were compared with both young grand and older grand multiparas for the length of hospital stay for 3days or more as shown in Table 2.

The overall neonatal complications were significantly increased among older grand multiparas women (*P* <.001). When compared to low-risk mothers, both young and older grand multiparas women were at a significantly increased risk of a low Apgar score < 7 at five

minutes and birth weight < 2.5 kg (<0.001). There were no significant differences between low risk, and young and older grand multiparas women in fresh stillborn babies and Apgar score of less than 7 at 5 minutes (p>0.05). older grand multiparas women showed a significantly increased rate of birth trauma, congenital anomalies, and fetal macrosomia when compared with low-risk mothers and young grand multiparas women (p>0.05), when comparison of these complications was made between low-risk mothers and grand multiparas women no significant differences were obtained (p>0.05). In addition both young and older grand multiparas showed a significantly increased rate of neonatal admission to intensive care units compared to low-risk women (Table 3).

5. DISCUSSION

The findings of the present study indicate that young grand multiparas compared to low-risk women are similar in most neonatal and maternal complications except for PPH and hospital stay ≥ 3days, and Apgar score< 7 at five minutes, birth weight < 2.5 kg and admission to NICU. When older grand multiparas women were compared to low-risk group, they show significantly increased in most of these complications including interventional vaginal delivery genital tract injury, admission to ICU, blood transfusion, maternal death, hospital stay => 3 days while most fetal complications that were significantly including fetal complications, Apgar Score< 7 at five minutes, birth weight < 2.5 kg, birth trauma, congenital anomalies, macrosomia, and NICU.

Many previous investigators compared the occurrence of various obstetric and neonatal complications between different parity groups. The results of these studies indicated that these complications increase significantly in a linear manner increase with increasing parity (12, 13). Pooja et al. (14), in their study examining the perinatal complications with increasing parity, reported that placenta praevia, intrauterine fetal growth restriction, the rate of labor induction, interventional delivery, post date pregnancy, abnormal CTG and shoulder dystocia showed increased occurrence with an increasing parity. These findings are consistent with our finding in older grand multiparas by inconsistent with young grand multiparas. In another study involving 512,733 singleton births in New South Wales, Australia indicates that parity 4 or the 5th baby is significantly associated with a negative impact on both fetal and maternal outcome (15). Our findings in older grand multiparas contradict other previous studies, which concluded that increase in parity does not result in increased risk for both fetal and maternal outcome (16, 17). Other few studies examining the effect of parity on pregnancy outcome reported that grand multiparity compared to the other parity groups have similar risks of maternal and neonatal complications and that grand multiparity should not be discouraged as long as women are provided with good prenatal care (18).

However, when young grand multiparas outcome women were compared to the low-risk group, they show similar maternal complications except for PPH and hospital stay ≥3 days and fetal complications specifically admission to NICU and birth weight less than 2.5 kg. Literature examining the obstetrical performance of young grand multiparity is scant and only one previous study was published by Simonsen et al in 2002. They found young grand multiparas at an increased risk of a preterm delivery and less likely having fetal distress, cesarean delivery, instrumented delivery, and any intrapartum complication compared to low parity and less likely to develop many fetal and maternal complications than older grand multiparity. The definitive increased obstetrics complications among older mother than young grand multiparas women is possibly due to the effect of progressive maternal age among older mothers. There are numerous studies focused on maternal age and pregnancy outcomes. More recent studies have focused on the pregnancies of ≥ 35 or more years due to changing trend to give birth. Advanced age was found to be associated with an elevated risk of adverse pregnancy furthermore; age was found as independent risk factors for many complications (19, 20). In addition to progressive maternal age, grand multiparas women are likely to be less educated, unemployed, and poor utilization of prenatal care (21, 22).

The shortcomings of this study are its relatively small sample size, lack of all parity, and gathering of data from a single center rather than multiple centers.

6. CONCLUSION

This study revealed that young grand multiparas women are not at increased risk of intrapartum complications when compared to multiparas women. While older grand multiparas women are at significant risk for poor maternal outcomes. Further studies are warranted to investigate pregnancy outcomes in young grand multiparas women since it is a problem in Arabs countries.

- **Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms.
- **Author's contribution:** Each author gave substantial contribution to the conception or design of the work and in the acquisition, analysis and interpretation of data for the work. Each author had role in drafting the work and revising it critically for important intellectual content. Each author gave final approval of the version to be published and they agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
- **Financial support and sponsorship:** Nil.
- **Conflicts of interest:** There are no conflicts of interest.

REFERENCES

1. Mgaya AH. et al., Grand multiparity: is it still a risk in pregnancy? BMC Pregnancy Childbirth. 2013; 13: 241.
2. Munim S. et al. The effect of grandmultiparity on pregnancy related complications: the Aga Khan University experience. J Pak Med Assoc. 2000; 50(2): 54-58.
3. Roman H. et al., Obstetric and neonatal outcomes in grand multiparity. Obstet Gynecol. 2004; 103(6): 1294-1299.
4. Monjurul H, Ehsanul H, Suriya B Kader. Pregnancy compli-

cations of grandmultiparity at a rural setting of South Africa. Iranian J of Reprod Med. 2008; 6: 25-31.
5. Geidam AD, Audu BM, Oummate Z. Pregnancy outcome among grand multiparous women at the University of Maiduguri Teaching Hospital: a case control study. J Obstet Gynaecol. 2011 Jul; 31(5): 404-408. doi: 10.3109/01443615.2011.561383.
6. Alhainiah MH, Abdulljabbar HSO, Bukhari YA. The Prevalence, the Fetal and Maternal Outcomes in Grand Multiparas Women. Mater Sociomed. 2018 Jun; 30(2): 118-120. doi: 10.5455/msm.2018.30.118-120.
7. Agrawal S, Agarwal A, Das V. Impact of grandmultiparity on obstetric outcome in low resource setting. J Obstet Gynaecol Res. 2011 Aug; 37(8): 1015-1019. doi: 10.1111/j.1447-0756.2010.01476.x.
8. Bugg GJ, Atwal GS, Maresh M. Grandmultiparae in a modern setting. BJOG 2002; 109: 249-253.
9. Bai J, Wong FW, Bauman A, Mohsin M. Parity and pregnancy outcomes. Am J Obstet Gynecol. 2002; 186: 274-278.
10. Koo YJ, Ryu HM, Yang JH, Lim JH, Lee JE, Kim MY, Chung JH. Pregnancy outcomes according to increasing maternal age.Taiwan J Obstet Gynecol. 2012 Mar; 51(1): 60-65. doi: 10.1016/j.tjog.2012.01.012.
11. Tannus S, Cohen Y, Henderson S, Son WY, Tulandi T. The Effect of Assisted Hatching on Live Birth Rate Following Fresh Embryo Transfer in Advanced Maternal Age. Reprod Sci. 2018 Sep 13: 1933719118799192. doi: 10.1177/1933719118799192.
12. Alsammani MA, Ahmed SR.Grand Multiparity: Risk Factors and Outcome in a Tertiary Hospital: a Comparative Study Mater Sociomed. 2015 Aug; 27(4): 244-247. doi: 10.5455/msm.2015.27.244-247
13. Alsammani MA, Ahmed SR .Fetal and Maternal Outcomes in Pregnancies Complicated with Fetal Macrosomia. N Am J Med Sci. 2012 Jun; 4(6): 283-286. doi: 10.4103/1947-2714.97212PMCID: PMC3385366
14. Pooja R. Vaswani, Sangeeta Sabharwal. Trends in the Occurrence of Antenatal and Perinatal Complications with Increasing Parity. J Obstet Gynaecol India. 2013 Aug; 63(4): 260-267. doi: 10.1007/s13224-012-0344-4
15. Bai J, Wong FW, Bauman A, Mohsin M. Parity and pregnancy outcomes.Am J Obstet Gynecol. 2002 Feb; 186(2): 274-278.
16. Goldman GA, Kaplan B, Neri A, Hecht-Resnick R, Harel L, Ovadia J. The grand multipara. Eur J Obstet Gynecol Reprod-Biol. 1995; 61: 105-109.
17. Babinszki A, Kerenyi T, Torok O, Grazi V, Lapinski RH, Berkowitz RL. Perinatal outcome in grand and great-grand multiparity: effects of parity on obstetric risk factors. Am J Obstet Gynecol. 1999; 181: 669-574.
18. Al-Shaikh GK, Ibrahim GH, Fayed AA, Al-Mandeel H..Grand multiparity and the possible risk of adverse maternal and neonatal outcomes: a dilemma to be deciphered.BMC Pregnancy Childbirth. 2017 Sep 19; 17(1): 310. doi: 10.1186/s12884-017-1508-0.
19. Smit F, Wijk HV, Gouw C, Duvekot H. Relationship Between Advanced Maternal Age and The Mode ofDelivery. A systematic review. Erasmus J Med. 2012; 3(1): 34-38.
20. Carolan M, Frankowska D. Advanced maternal age and adverse perinatal outcome: a review of the evidence. Midwifery. 2011; 27(6): 793-801. doi: 10.1016/j.midw.2010.07.006.
21. Alsammani MA, Alsheeha MA, Ahmed SR, Abdalla AM. The effect of advanced maternal age on pregnancy outcome in women with cervical insufficiency treated with cerclage. Group. 2012; 1(38): 71-73.
22. Al-Shaikh GK, Ibrahim GH, Fayed AA, Al-Mandeel H. Grand multiparity and the possible risk of adverse maternal and neonatal outcomes: a dilemma to be deciphered. BMC Pregnancy Childbirth. 2017 Sep 19; 17(1): 310. doi: 10.1186/s12884-017-1508-0.