Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i6.6543

IMPACT OF GRAND MULTIPARITY ON MATERNAL AND FETAL HEALTH: A CROSS-SECTIONAL STUDY

Tayyaba Rashid[1*], Azra Saeed Awan[2], Riffat Nawaz[3], Fouzia Saghir[4]

[1*]Senior Registrar, Foundation University Medical College/Fauji Foundation Hospital, Islamabad, Pakistan
[2]Professor Obs and Gynae, Foundation University Medical College/Fauji Foundation Hospital, Islamabad, Pakistan
[3]Senior Registrar, Shalamar Medical and Dental College/ Shalamar Hospital, Lahore, Pakistan
[4]WMO, Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Pakistan

***Corresponding author:** Dr Tayyaba Rashid
*Email address: tayyaba121@gmail.com

Abstract:

Background: Grand multiparity is the risk in pregnancy with increase maternal and fetal morbidity and mortality. Its prevalence is high among developing and under developed countries where mother-child health is neglected. Its risk factors have been identified but its impact on health outcomes of mother and child are still of concern.

Introduction: Grand multiparity has been considered an independent factor for increasing adverse outcome for both fetus and mother specially diabetes mellitus, antepartum hemorrhage, malpresentation, cesarean section rate, postpartum hemorrhage, iron deficiency anemia, and a high perinatal mortality rate.

Methodology: A descriptive cross sectional study was conducted on 500 pregnant females in the Department of Obstetrics and Gynaecology, Fauji Foundation Hospital, Rawalpindi. Study was carried out over a period of eight months from October 2019 to May 2020. After ethical approval from institute through purposive sampling data was collected among pregnant female fulfilling the inclusion criteria. Antenatal record was reviewed for any antenatal complications (like anemia, malpresentation and PIH). During labor patients were managed according to the unit protocol and portogram was used to monitor the progress of labor and like PPH, prolong labor, birth weight was measured. Data was analyzed for qualitative and quantitative variables, where age, gestational period and parity were presented with mean and standard deviation and percentage of C-section, postpartum hemorrhage, PIH, anemia, malpresentation and fetal outcome were analyzed. Chi- square test of significance(with $p \leq 0.05$) was used to determine the relation of grand parity with maternal and fetal outcome.

Results: Patients ranged between 25-45 years with mean age 36.59±4.12. Mean gestational age was 38.58±0.84 weeks. Majority of the patients were gravida 5-9. Pregnancy induced hypertension(PIH) developed in 123 patients, anemia in 197 patients (39.4%), malpresentation seen in 66 cases (13.2%), prolonged labor occurred in 35 cases (7%), Caesarean section was carried out in 189 cases (37.8%) while normal vaginal delivery observed in 311 patients (62.2%), Postpartum hemorrhage(PPH) seen in 53 patients (18%), macrosomia developed in 48 cases (9.6%). Stratification for age, gestational age and parity was carried out.

Conclusion: This study demonstrated that grand multiparity remains a major obstetrics problem. It is associated with pregnancy induced hypertension, anemia and cesarean section. In communities where large family is desirable it is important to address the value of family planning and conduction of meticulous antenatal care.

Key words: Grand multiparity, fetal and maternal outcome, Cesarian, Low birth weight, Postpartum hemorrhage.

Introduction:

Grand multiparity, defined as the condition in which a woman has given birth to five or more children, remains a topic of interest in obstetrics due to its association with various maternal and fetal complications.(1) While the prevalence of grand multiparity has decreased in developed countries, it continues to be a concern in developing countries such as Pakistan. This research aims to explore the potential complications associated with grand multiparity and understand its impact on maternal and fetal outcomes.

A research has demonstrated an increased risk of several maternal complications in grand multiparous women. These complications include gestational diabetes, pre-eclampsia, placenta previa, multiple pregnancy, chromosomal abnormalities, birth defects, malpresentations, prolonged labor, post-partum hemorrhage, uterine rupture, increased operative birth, genital sepsis, and utero-vaginal prolapse.(2) However, it is important to note that not all studies have found grand multiparity to be an independent risk factor for adverse pregnancy outcomes.

Another study conducted in Nigeria reported a higher incidence of antenatal and intrapartum complications in grand multiparas. This study identified anemia in pregnancy as more common in the grand multipara group than in the control group.(3) A higher rate of cesarean section deliveries was also observed in grand multiparas compared to the control group.

The impact of grand multiparity on fetal outcomes has been examined in several studies. Although some studies have reported a higher incidence of congenital anomalies and perinatal deaths in grand multiparous women, these findings were not statistically significant.(4,5) Other studies did not find any significant differences in terms of mode of delivery, prevalence of low and high birth weight (≥4 kg) babies, stillbirth, multiple pregnancies, or fetal distress.(6,7)

The prevalence of grand multiparity is influenced by various factors, including illiteracy, religious beliefs, and social norms.(8) These factors often hinder greater contraceptive use and contribute to higher birth rates in developing countries. Conversely, the incidence of grand multiparity has decreased in western countries due to improved socioeconomic status and increased utilization of contraception.(9,10)

Grand multiparity has been associated with an increased risk of macrosomia, which is defined as a birth weight greater than 4kg. Studies have identified grand multiparity as a common cause of macrosomia. Additionally, grand multiparity is also linked to low birth weight in cases of pregnancy-induced hypertension, chronic hypertension, and other factors.(11)

The incidence of neonatal deaths among grand multipara women is higher due to congenital anomalies. These anomalies contribute significantly to the large number of neonatal deaths observed in this population.

According to Fuchs, the incidence of caesarean section in grand multipara women is reported to be 7.8%.(12) Primary caesarean section in multiparous women is often attributed to factors such as cephalopelvic disproportion, uterine inertia, and malpresentation. However, a study conducted by Buyuk et al showed that the most common indication for primary caesarean section in grand multipara women is fetal distress, followed by failure to progress.(13) Other common indications include hemorrhage due to placenta previa or abruptio placenta. Furthermore, caesarean sections in grand multipara women can be associated with more complications due to their poor general condition, late presentation, and delayed decision-making.

Antepartum hemorrhage, specifically placenta previa, is a major concern in grand multipara women. Factors such as multiparity and advanced maternal age contribute to the occurrence of placenta previa.

Defective vascularization of the decidua, resulting from inflammation or atrophic changes caused by pregnancies in rapid succession, limits the blood supply to the placenta. This leads to its spread over a larger area of the uterus than usual, increasing the risk of antepartum hemorrhage.
This study identifies the gap of maternal and fetal outcome in relation to certain factors in pregnant women with grand multiparity. By elucidating the relationship between grand multiparity and fetal and maternal outcomes in a cross-sectional study design, we aim to provide insights that can inform clinical practice, healthcare policy, and public health initiatives.

Methodology:
Study design: Descriptive cross sectional.

Setting: Department of Obstetrics and Gynaecology, Fauji Foundation Hospital, Rawalpindi.

Duration of study : Study was carried out over a period of eight months from October 2019 to May 2020.

Sample size : With WHO sample size calculator, following were the calculations: Confidence level: 95 % Anticipated population proportion: 3% Absolute precision required: 1.5 %(14) Sample size: n: (497) approx. came out to be 500 patients.

Sampling technique: Non-probability purposive sampling technique.
Sample selection:
Inclusion Criteria - Women who were between 25-45 years of age at more than 37-41 weeks of gestation.
Exclusion Criteria - All patients with a history of any of these problems were excluded from the study - Essential Hypertension - Already taking antihypertensive medication - Diabetes - Rh isoimmunisation - Depression - Congestive heart failure - Heart block or Bronchial asthma - Multiple pregnancies.

Data collection procedure:
The study was conducted after approval from hospital ethical and research board. All women meeting 73 the inclusion criteria were invited to participate in the study. The purpose and benefits of the study were explained to all women and if agreed upon, a written informed consent was obtained. All women who delivered in our unit was evaluated irrespective of their booking status. Detailed history clinical examination was done and antenatal record was reviewed for any antenatal complications (like anemia, malpresentation and PIH). During labor patients was managed according to the unit protocol and portogram was used to monitor the progress of labor and like PPH, prolong labor, birth weight was measured. Strictly exclusion criteria was followed to control confounders and bias in the study results. All the observations were done under supervisions of supervisor.

Data analysis:
The statistical software SPSS version 26.0 was used for data analysis. All results were presented in the form of tables. For qualitative variables i.e. grand multiparity, anemia, PPH, malpresentation, prolonged labor, LBW, macrosomia frequencies and percentages were calculated. Effect modifiers like age, gestational age, parity were controlled by stratification. Post stratification Chi square test was applied. P value ≤ 0.05 was taken as significant.

Results:
A total of 500 patients were included in this study during the study period of eight months from October 2019 to May 2020. Patients ranged between 25-45 years with mean age 36.59±4.12, mean gestational age was 38.58±0.84 weeks. Majority of the patients were gravida 5-9 (Table-1). PIH developed in 123 patients, anemia in 197 patients (39.4%), malpresentation seen in 66 cases (13.2%), prolonged labor occurred in 35 cases (7%), Caesarean section was carried out in 189 cases (37.8%)

while normal vaginal delivery observed in 311 patients (62.2%), PPH seen in 53 patients (18%), macrosomia developed in 48 cases (9.6%) (Figure 1).

Stratification for age, gestational age and parity was carried out to 33. The study identified several obstetric complications. Of the 500 patients, 123 (24.6%) developed pregnancy-induced hypertension (PIH), 197 (39.4%) had anemia, 66 (13.2%) presented with malpresentation, and 35 (7%) experienced prolonged labor. Caesarean section was performed in 189 cases (37.8%) while 311 patients (62.2%) had a normal vaginal delivery. Postpartum hemorrhage (PPH) was observed in 53 patients (18%), and macrosomia was identified in 48 cases (9.6%) as shown in table 2 only pregnancy induced hypertension is significantly related to grand parity.

Table 1: Frequency of maternal age, gestational period and grand parity among pregnant females.

Characteristics	**Percentage(n=500)**	**Mean ± SD**
Age in years 25-35 36-45	 37.6 (188) 62.4 (312)	36.59± 4.12
Gestational age in weeks 37- 39 41- 43	 89.4 (447) 10.6 (53)	38.58 ± 0.84
Grand parity 5-9 10-13	 93 (465) 7 (35)	7.21 ± 1.2

Table 2: Relationship of Maternal and Fetal outcomes with Grand parity

Outcome	n=500	p-value
Pregnancy Induced Hypertension	123	0.028
Anemia	197	0.664
Malpresentation	66	0.402
Prolong labor	35	0.287
C-section	189	0.317
PPH	53	0.33
Low birth weight	90	0.218
Macrosomia	48	0.703

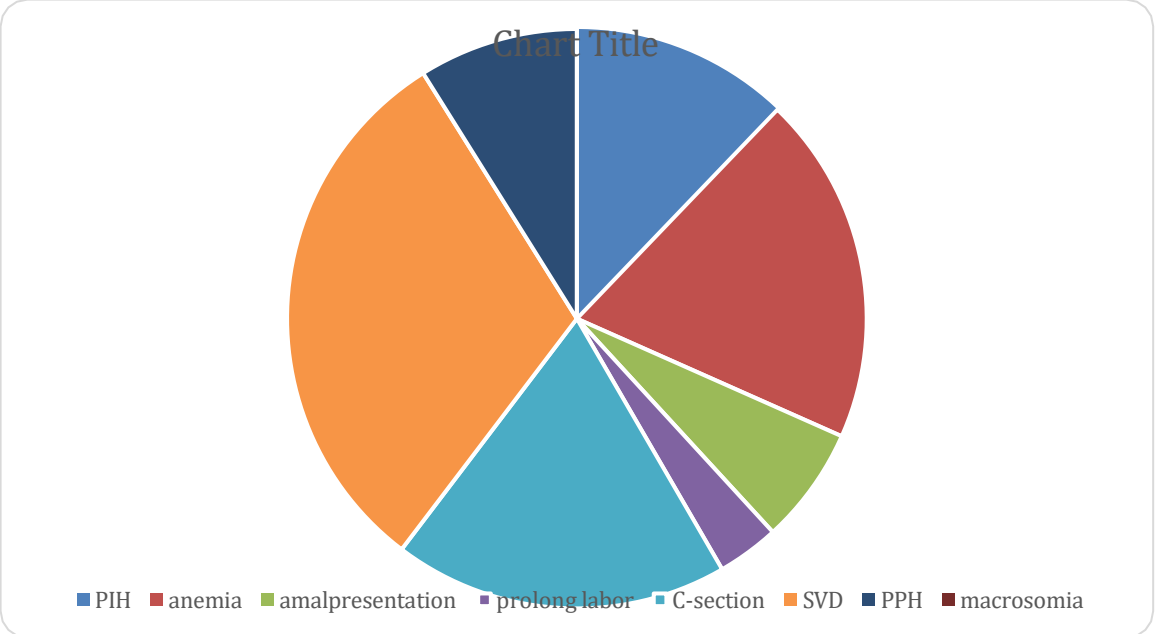

Figure 1: Percentage of maternal and fetal outcomes among grand para women.

Discussion:

This study was conducted at Holy Family Hospital Rawalpindi compared grand multipara and multipara groups, demonstrating that grand multiparity was not an independent risk factor for poor pregnancy outcomes. The most frequent complication observed in both groups was anemia, with a similar incidence rate. The study also found a significantly lower rate of perineal tears in the grand multipara group compared to the multipara group. However, the study reported slightly increased rates of macrosomia and low birth weight babies in the grand multipara group.

Earlier studies have suggested that grand multiparity is associated with older maternal age, which could potentially explain the increased morbidity and mortality observed in this group.(15) However, it is important to note that age alone cannot be solely attributed as a causal factor. A study showed 37.6% were ≤35 years of age, indicating that there is a concept of "younger grand multiparity" contributing to further complications. Interestingly, there was no significant difference observed in the C-Section rate between grand multiparity aged ≤35 years and those greater than 35 years.(13) This suggests that younger grand multiparas may be starting their reproductive journey before pelvic maturity, leading to a higher rate of C-Section due to feto-pelvic disproportion.(16) On the other hand, the high rate of C-Section among older grand multiparas could be attributed to secondary contracted pelvis resulting from repeated compensatory lordosis of pregnancy.(17,18)

The high prevalence of PIH, anemia, malpresentation, and prolonged labor among the study population suggests a need for further research and preventative measures in these areas.(19) Caesarean section rates were relatively high this finding highlights the importance of appropriate indications and caution when performing this procedure. Contrary to some previous findings, this study revealed an association between grand multiparity and adverse pregnancy outcomes, including C-Section, anemia, and pregnancy-induced hypertension.(20) These findings support the notion that grand multiparity continues to pose potential risks for adverse pregnancy outcomes, even after controlling for confounding variables.

Although our study did not find a significant association between grand multiparity and malpresentation, prolonged labor, PPH, and macrosomia, other studies have reported a stronger association of PPH in grand multiparas.(11,21)It is important to further investigate these associations to determine the underlying causes and identify potential interventions to mitigate the risks.

By examining the distribution of complications within different age groups, it may be possible to identify specific risk factors and implement targeted interventions. The prevalence of various complications, such as PIH, anemia, malpresentation, and prolonged labor, was determined. Caesarean section rates were relatively high, suggesting a need for further investigation into appropriate indications for this procedure. Also a more thorough understanding of the impact of these factors on obstetric outcomes can guide future research and interventions aimed at improving maternal and fetal health.

Although our study did not find a significant association between grand multiparity and malpresentation, prolonged labor, PPH, and macrosomia, other studies have reported a stronger association of PPH in grand multiparas. Despite advancements in obstetric care, grand multiparity remains a topic of concern due to its association with various adverse outcomes, including gestational hypertension, gestational diabetes, preterm labor, and intrauterine growth restriction.

Conclusion:

Grand multiparity has been associated with an increased risk of maternal and fetal complications, not all studies have found it to be an independent risk factor. Factors such as improved socioeconomic status and access to contraception have contributed to the decline in grand multiparity in some regions. However, in countries like Pakistan, where the incidence of grand multiparity remains high, efforts should be focused on improving antenatal care, preventing complications, and providing counseling on contraception options. Further research is needed to better understand the impact of grand multiparity and develop appropriate interventions to minimize associated risks.

References:

1. Dacheva T. 384 Great grand-multiparity. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2022;270.
2. Tariq R, Javed A, Noreen Z. COMPARISON OF OBSTETRICAL COMPLICATIONS IN MULTIPARA AND GRAND MULTIPARA. International Journal of Medical Science And Diagnosis Research. 2020;4(11).
3. Solanke BL. Maternal socio-demographic factors associated with low parity and grand multiparity in Nigeria. Women Health. 2019;59(7).
4. Dasa TT, Okunlola MA, Dessie Y. Effect of grand multiparity on adverse maternal outcomes: A prospective cohort study. Front Public Health. 2022;10.
5. Alkwai H, Khan F, Alshammari R, Batool A, Sogeir E, Alenazi F, et al. The Association between Grand Multiparity and Adverse Neonatal Outcomes: A Retrospective Cohort Study from Ha'il, Saudi Arabia. Children. 2023;10(9).
6. Recabo O, Gould AJ, Has P, Ayala NK, Kole-White MB, Danilack VA, et al. Are infants born to high-risk patients with grand multiparity at increased risk of adverse outcomes? Am J Obstet Gynecol. 2022;226(1).
7. Handing G, Straneo M, Agossou C, Wanduru P, Kandeya B, Abeid MS, et al. Birth asphyxia and its association with grand multiparity and referral among hospital births: A prospective cross-sectional study in Benin, Malawi, Tanzania and Uganda. Acta Obstet Gynecol Scand. 2024;103(3).
8. Ajong AB, Agbor VN, Simo LP, Noubiap JJ, Njim T. Grand multiparity in rural Cameroon: Prevalence and adverse maternal and fetal delivery outcomes. BMC Pregnancy Childbirth. 2019;19(1).
9. Njoku CO, Abeshi SE, Emechebe CI. Grand Multiparity: Obstetric Outcome in Comparison with Multiparous Women in a Developing Country. Open J Obstet Gynecol. 2017;07(07).
10. Bornstein E, Eliner Y, Chervenak FA, Grünebaum A. Concerning trends in maternal risk factors in the United States: 1989–2018. EClinicalMedicine. 2020;29–30.
11. Adugna DG, Worku MG. Maternal and neonatal factors associated with low birth weight among neonates delivered at the University of Gondar comprehensive specialized hospital, Northwest Ethiopia. Front Pediatr. 2022;10.
12. Dyack C, Hughes PF, Simbakalia JB. Vaginal delivery in the grand multipara following previous lower segment cesarian section. Journal of Obstetrics and Gynaecology Research. 1997;23(2).
13. Buyuk GN, Kansu-Celik H, Kaplan ZAO, Kisa B, Ozel S, Engin-Ustun Y. Risk Factors for Intrapartum Cesarean Section Delivery in Low-risk Multiparous Women following at Least a Prior Vaginal Birth (Robson Classification 3 and 4). Revista Brasileira de Ginecologia e Obstetricia. 2021;43(6).
14. Yimer NB, Tenaw Z, Gedefaw A. PREGNANCY OUTCOMES IN GRAND MULTIPAROUS WOMEN: DOES PARITY MATTER? A COMPARATIVE STUDY. Ethiopian Journal of Reproductive Health. 2020;12(1).
15. Kaya Şenol D, Gözüyeşil E. Evaluation of the quality of sexual life and sexual function in women with grand multiparity. Health Care Women Int. 2023;
16. Mgaya AH, Massawe SN, Kidanto HL, Mgaya HN. Grand multiparity: Is it still a risk in pregnancy? BMC Pregnancy Childbirth. 2013;13.
17. Alsammani MA, Jafer AM, Khieri SA, Ali AO, Shaaeldin MA. Effect of Grand Multiparity on Pregnancy Outcomes in Women Under 35 Years of Age: a Comparative Study. Med Arch. 2019;73(2).
18. Ronen JA, Castaneda K, Sadre SY. Early Accreta and Uterine Rupture in the Second Trimester. Cureus. 2018;
19. Yadav N, Damke S. Study of risk factors in children with birth asphyxia. Int J Contemp Pediatrics. 2017;4(2).
20. Abdelmageed E, Bahaeldin H, Nadiah A, Abdelbagi A, Duria R, Ishag A. Maternal and neonatal outcomes of grand multiparity in Khartoum, Sudan. Afr Health Sci. 2022;22.

21. Subba T, Singh B, Rentta M, Madhukumar A, Sarkar B, Das R. Effect of intravenous tranexamic acid in reducing blood loss during and after caesarean section: a quasi-experimental study in RIMS, Manipur. Int J Reprod Contracept Obstet Gynecol. 2023;12(5).