Original Research Article

Grandmultiparity in Modern Obstetrics: A Retrospective Analysis of maternal and fetal outcome in a Tertiary Hospital, Gwalior

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Abstract

Background: Grandmultiparity has been associated with increased risks of adverse pregnancy outcomes. More recent literature has contradicted the earlier reports and showed that grandmultiparity does not entail significant maternal or neonatal risks in a modern obstetrical setting. This study aimed to estimate the proportion of grandmultiparous women admitted during the study period in our institute and to study the maternal and perinatal outcomes related to grandmultiparity.**Methods:**This is a retrospective cross sectional descriptive study conducted in the Department of Obstetrics and Gynaecology, Gajra Raja Medical College, Gwalior (M.P.), during a period of 1 year from January 2019 to December 2019. The retrospective review of case records of all grandmultiparae admitted in labor ward during the study period was done. Analysis was done with the excel computer software and results were reported as percentage.**Results:**During the study period, total number of women delivered was 9977, out of which 159 were grand multipara with a prevalence of 1.5 %. Majority of women were in age group 31-35 years (62.26 %), were from rural areas (74.21 %), were referred (77.98 %) and had no antenatal visits (90.32 %). 116 (72.95 %) patients delivered vaginally, while 42 (26.41 %) patients were delivered by lower segment caesarean section. The main indication of caesarean section was placenta previa. Maternal complications noted were preterm delivery (12.57 %), premature rupture of membranes (5.66 %), malpresentation (12.02 %) and antepartum hemorrhage (6.9 %). Placenta previa was seen in 5.66 % women and 2 patients presented with placental abruption. Cesarean hysterectomy was done in one patient for placenta percreta. No case of atonic PPH was noted. In present study there was no maternal death reported among grand multipara. 136(85.53 %) babies were born alive, 17 (10.69 %) patients presented with intrauterine fetal death on admission. There were 6 perinatal deaths. 25.78 % newborns were born with low birth weight. **Conclusions:**Grandmultiparity is still an obstetric risk factor. Proper antenatal care, timely referral, properly timed caesarean section in selected cases would reduce the grandmultiparity associated adverse pregnancy outcomes.

Keywords: Grandmultiparity, Obstetric Complications, Antenatal Care, Perinatal Death.

Introduction

A grand multipara is defined as a pregnant woman who has given birth to four or more viable babies in the past (NICE guideline 2007) [1,2]. The International Federation of Gynecology and Obstetrics (1993) define grandmultiparity as delivery of the fifth to ninth infant, whereas women who are undergoing their tenth (or more) delivery are considered to be great-grand-multiparas[3].

In developed countries, grandmultiparity is uncommon mostly due to socio-cultural factors, wide spread practice of family planning methods, and improved health services. Despite the government's population policies which favor the small family size, high parity still remains a common feature of obstetric practice in developing countries. It occurs mainly in communities where contraception is not accepted because of specific religious or cultural beliefs. In developing countries grand multipara women mostly have illiteracy, nutrition deficiencies and unfortunately they do not get the chance to take optimal antenatal care.

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Grandmultiparity has been described as an independent risk factor for a variety of obstetric complications, especially in developing countries with inadequate health facilities. Common complications, especially in developing countries with inadequate health facilities. Common complications associated with grandmultiparity are malpresentations, antepartum haemorrhage, gestational diabetes mellitus, pregnancy-associated hypertension, premature rupture of membranes, preterm labor, rupture uterus, adherent placentan and postpartum haemorrhage[1,2].Maternal mortality also rises with higher degrees of parity, increasing progressively with each child after the fifth delivery. Rupture uterus, chronic hypertensive disease and placental complications are some of the important causes that contribute to maternal mortality. The risk of perinatal death as well as neonatal morbidity rises sharply, once the parity is greater than four[2].However, there is still controversy as more recent literature reported that grand multiparous women do not have an increased incidence of obstetric complications in a modern obstetrical setting particularly in countries where there are satisfactory health care conditions[3,4].Every obstetrician must be familiar with the potential complications and their consequences in these women.

Aims and Objectives

The current study was conducted to estimate the proportion of grandmultiparous women admitted during the study period in our

institute and to assess the maternal and perinatal outcomes related to grandmultiparity.

Methods

This is a retrospective cross sectional descriptive study conducted in the Department of Obstetrics and Gynaecology, Gajra Raja Medical College, Gwalior (M.P.), during a period of 1 year from January 2019 to December 2019. The study included all grand multiparous women delivered during the study period. Grandmultiparity was defined as a woman who has already had four or more deliveries of at least ≥ 28 weeks gestation. Primipara and multipara with parity <4 were excluded from the study.

The data was obtained from the hospital medical records. Firstly delivery registers were reviewed and all grand multiparous women delivered during the study period were found out. Then their case records were collected and reviewed to collect sociodemographic data and data to assess maternal and fetal outcome. Parameters were collected and analysed with regard to maternal age, residence, parity, booking status, gestational age at delivery and mode of delivery. History of previous perinatal deaths was also recorded.Maternal variables we assessed included diabetes mellitus, hypertensive disorders of pregnancy, premature rupture of membrane, placental abruption, placenta previa, postpartum hemorrhage, cesarean hysterectomy, preterm labor, and post term labor. Data regarding indication of caesarean section was also noted. Neonatal outcomes like birth weight, congenital malformations, prematurity and perinatal deaths were also studied. Booked status refers to women who had 3 or more antenatal visits.

Statistical Analysis

Analysis was done with the excel computer software and results were reported as percentage.

Results

During the study period of one year, total number of women delivered was 9977, out of which 159 were grand multipara so the proportion of grandmultipara was 1.5 %.

Table 1: Demographic Characteristics

S. No.		Characteristic	Number	Percentage
1	Maternal age in years	25-30	19	11.94
		31-35	99	62.26
		36-40	29	18.23
		>40	12	7.54
3	Locality	Rural	118	74.21
		Urban	41	25.78
4	Referral status	Direct	35	22.01
		Referred	124	77.98
5	Booking status	Booked	28	17.61
		Unbooked	131	82.38

Table 1 demonstrates demographic characteristics of patients. Majority of women were in age group 31-35 years (62.26 %), were from rural areas 118 (74.21 %), were referred from different hospitals (77.98 %) and had no antenatal visits 131 (90.32 %).

In present study, majority of women were fourth para (64.77 %) followed by fifth (24.52 %) and sixth para (8.8 %).

In present study, 77 (48.42%) women had history of previous perinatal losses. 43 (27.04%)women had history of one perinatal death, 28 (17.61%)women had history of 2 perinatal deaths, 4 (2.5%) women had history of 3, while 1(0.62%) had history of 4 and one woman (0.62%) had history of 5 perinatal deaths.

Table 2:Distribution of cases according to Gestational age at delivery

Gestational age in weeks	Number of cases	Percentage
<28	2	1.25
28-32	9	5.66
33-36	9	5.66
37-40	136	85.53
≥ 40	3	1.88
Total	159	100.0

Majority of patients 136 (85.53 %) presented at gestational age between 37-40 weeks, 9 (5.66 %) patients between 33-36 weeks, 9 (5.66 %) patients between 28-32 weeks and 2 (1.25 %) at <28 weeks. Only 3 patients presented beyond 40 weeks. (Table 2)

Table 3: Distribution of cases according to Mode of delivery

Mode of delivery	Number of cases	Percentage
Vaginal delivery	116	72.95
Lower segment caesarean section	42	26.41
Hysterotomy	1	0.62
Total	159	100.0

In present study, 116 (72.95 %) patients delivered vaginally, while 42 (26.41 %) patients were delivered by lower segment caesarean section.in on epatient emergency hysterotomy was done at 24 weeks who presented with antepartum hemorrhage due to complete placenta previa. (Table 3)

The main indication of caesarean section was placenta previa in 8 (19.04 %) women followed by malpresentation (breech in one patient and transverse lie in 4 patients) and intrauterine growth restriction with oligohydramnios in 5 cases each. Obstructed labor and cephalopelvic disproportion accounted for 3 cases each. Two patients with severe pre-eclampsia and one with antepartum eclampsia were delivered by cesarean section.

Table 4:Distribution of cases according to Maternal complications

Maternal complication	No. of cases	Percentage

Preterm delivery	20	12.57
Antepartum eclampsia	1	0.62
Severe preeclampsia	3	1.88
Gestational diabetes mellitus	1	0.62
Abruptio placentae	2	1.25
Placenta previa	9	5.66
Placenta accrete	1	0.62
Breech presentation	15	9.4
Transverse lie	4	1.25
Premature rupture of membranes	9	5.66
Cesarean Hysterectomy	1	0.62

12.57 % grand multipara had preterm delivery before 37 weeks. 12.02 % women presented with malpresentation. Breech was the most common malpresentation seen in 15 (9.4 %) women. Transverse lie was found in 4(1.25 %) women. 14 women with breech presentation were delivered vaginally as they were in active labor at the time of admission, while one women was delivered by cesarean section. Antepartum hemorrhage was observed in 11(6.9 %) patients, out of which Placenta previa was seen in 9 (5.66 %) women, all of them were delivered by cesarean section. 2 patients presented with placental abruption. Premature rupture of membranes was present in 9 (5.66 %) patients. Cesarean hysterectomy was done in one patient who presented with placenta accreta. (Table 4)

Table 5: Distribution of cases according to Fetal outcome

Fetal outcome	Number of cases	Percentage
Alive	136	85.53
Intrauterine death	17	10.69
Still Birth	2	1.25
Neonatal death	4	2.51
Total	159	100.0

136 (85.53 %) babies were born alive, 17 (10.69 %) patients presented with intrauterine fetal death on admission. There were 6 (4.06 %) perinatal deaths (2 stillbirth and 4 neonatal deaths) reported in our study. (Table 5)

Table 6:Distribution of cases according to Birth Weight

Birth weight in Kg	Number of cases	Percentage
<1(extremely low birth weight)	3	1.88
1- 1.4 (very low birth weight)	2	1.25
1.5 - 2.4(low birth weight)	36	22.64
2.5-2.9 (Normal)	83	52.20
3-3.4 (Normal)	27	16.98
3.5-3.9(normal)	8	5.03
≥4(macrosomia)	1	0.62
Total	159	100.0

118 (74.21 %) patients delivered babies with birth weight ≥ 2.5 kg, 36 (22.64 %) babies had birth weight between 1.5-2.4 kg (low birth weight) and 5 (3.14 %) babies were < 1.5 kg(very low birth weight). (Table 6)

Discussion

Even since Solomons in 1934 drew attention to what he called 'the dangerous multipara', grandmultiparity has been recognized as a clinical entity in its own right[2]. High parity is among the factors that may contribute to poor maternal and perinatal outcomes especially anemia, preterm birth, postpartum hemorrhage and perinatal deaths. Grandmultiparity is a rare issue in developed countries, but it is still common in developing countries like India. In present study, the proportion of grandmultiparous women was 1.5 %, higher than reported by Satya Das et al in their study conducted in Western Odisha, India (1.01 %) and lower than reported by Asima Afzal et al and SantoshMeena et al in their studies conducted in Jammu Kashmir, India (5.76 %) and Kota, Rajasthan(4.5%) respectively[5-7].The proportion of grandmultiparouw women reported in our study is lower than reported in other low income countries. Prevalence of grandmultiparity reported by Ghadeer K. Al-Shaikh et al was 10.2 % in Saudi population[4].The practice of early marriages, desire of large family for cultural reasons and religious beliefs that do not support the use of contraception are the reasons that cause an increase in the incidence of grandmultiparity in the Saudi population. In a study by ZainabMuniro et al conducted in Tanzania, a low income country prevalence of grand multiparity was 9.44 % which is higher than reported in our study[8].In a study by Patrick Idoko el al conducted in a teaching hospital, Banjul, Gambia(a developing country in Africa), prevalence of grandmultiparity was 26.5%. Reasons for the current pregnancy in their study were : the desire for another child, need to replace a dead child or a mistake[9].According to the CDC report of 2004, the prevalence of grand multiparity was reported as low as 3–4 % in developed countries as compared to 19.3 % in developing countries. High prevalence of grandmultiparity in low income countries is fueled by gender desirability, low education and desire for more offspring to have large family size[8]. With the widespread application of family planning in developed countries, grandmultiparity has decreased in Western society and its prevalence became very low (~4 % of all births).The lower proportion of grandmultipara, reported in present study can be explained by the fact that our hospital being a tertiary hospital received only those grandmultiparae who were referred from peripheral hospitals (government and private) with some high risk factors or in early labor. Many grandmultiparae living in villages might have delivered at peripheral hospitals or at home. It can also be attributed to wide spread practice of family planning methods and increased community awareness on the health risks of giving birth at an advanced maternal age in urban population.In present study, majority of women were in age group 31-35 years (62.26 %), which indicate early age of marriage and less inter pregnancy interval. Similar finding was reported by Satya Das et al[5]. In contrast to our study, in a study by Ghadeer K. Al-Shaikh et al, majority of GMP women belonged to younger age group (25-30 years) than our study[4].In present study, 74.21 % patients were from rural areas and majority (77.98 %) of women were referred from different hospitals.

Many of the maternal complications seen in the grandmultiparae appear to arise from delay in the management.In present study, majority (82.38 %) of patients had no antenatal visits. This indicates the importance of antenatal care as the single intervention which could influence occurrence of complications in this high risk group of patients. It is possible that multiparous mothers, who have greater experience, feel more confident during pregnancy and consider antenatal care less important. Further these women find it difficult to attend a health facility due to the time constraints imposed by their large demanding families.In present study, majority of women were fourth para (64.77 %) followed by fifth (24.52 %) and sixth para (8.8 %). Similar finding was reported by PayalAnandbhai et al[10].

In our study a high prevalence of a history of perinatal loss was evident in grand multiparae. Willingness to have a pregnancy with successful outcome seems to be one of the reason of high parity in these women.In present study, majority of women 136 (85.53 %) presented at gestational age between 37-40 weeks.In a study by Ghadeer K. Al-Shaikh et al Gestational age at delivery was38.6 ± 2.2 weeks (mean ± SD) In present study, 116 (72.95 %) women delivered vaginally, while 42 (26.58 %) women were delivered by lower segment caesarean section. None of the women delivered by instrumental delivery.One fifth gravid presented at 24 weeks with twin pregnancy with complete placenta previa with active bleeding per vaginum, emergency hysterotomy was done, two babies with 250 gm weight of each were delivered.As compared to our study, in a study by Hemlata et al , lesser number (11.89%)of grandmultiparous women underwent LSCS. [11]In a study by Ghadeer K. Al-Shaikh et al only 19.5 % of study population were delivered by CS [4]. A high Caesarean Section rate in present study is attributed to unbooked and referred mothers who came in a critical condition with a history of trial of labour or with complications like severe preeclampsia and eclampsia, antepartum hemorrhage and end up with emergency Caesarean Section in order to safeguard the life of the mother and the fetus. Also most grandmultiparous women with failure to progress in second stage of labor had a cesarean section rather than risking a difficult instrumental delivery.The main indication of caesarean section was placenta previa in 8(19.04%) women. Obstructed labor and cephalopelvic disproportion accounted for 3 cases each. In contrast to our study, in study by SantoshMeena 21% grandmultiparae presented with obstructed labor.[7] In study by Indrani Roy commonest indication for cesarean section were obstructed labor and fetal distress[12]. The caesarean section in the grandmultiparae for cephalopelvic disproportion could be explained by increasing size of the fetus with successive pregnancies; secondary contracted pelvis which is mostly related to ill-nourished mothers and forward projection of the sacrum due to subluxation of the sacroiliac joints, thereby diminishing the inlet conjugate. Failure to recognize this condition may result in uterine rupture.In present study, 12.57 % grandmultipara had preterm delivery. In a study by Ghadeer K. Al-Shaikh et al spontaneous preterm delivery was the most common obstetric complications in grandmultiparae[4].

In present study,10.69 % women presented with malpresentation. Breech was the most common malpresentation seen in 15(9.4 %) women. 14 women with breech presentation were delivered vaginally as they were in active labor at the time of admission, while one women was delivered by cesarean section. In study by Sundar Pal Singh et al Breech was the commonest malpresentation[13].In a study by Ikeanyi Eugene et al grandmultiparity was significantly associated with abnormal lie.[3]Multiparity promotes abnormal presentations because of the laxity of the abdominal wall, uterine tone and increased pelvic inclination resulting from associated lordosis.

In present study, antepartum hemorrhage was observed in 11(6.9 %) patients, out of which placenta previa was seen in 9(5.66 %) women, all of them were delivered by cesarean section. 2 patients presented with placental abruption. In study by Sundar Pal Singh et al antepartum hemorrhage was observed in 13 % of the cases which included placenta previa (5 %) and placental abruption (8 %).[13] In a study by SantoshMeenaantapartumhaemorrhage was found in 28% grandmultiparous women and placenta previa was found more prevalent than abruption placentae.[7] Increasing maternal age increases the risk of previa by changing uterine blood flow. Similarly in young grandmuliparas the cumulative effects of many deliveries may prematurely age the uterus and increase the subsequent risk of developing previa. The incidence of abruption is four times higher in multiparae as compared to primigravidae. It increases markedly after fifth pregnancy, particularly if pregnancies occur at short intervals. Nutritional deficiencies may play a role in the pathophysiology of abruption in this population[2].In our study, premature rupture of membranes was present in 9(5.66 %) patients. In a study by Zainab Muniro et al premature rupture of membranes was significantly associated with grand multiparity[8].

In present study 3(1.8 %) patients presented with severe preeclampsia, 1 patient presented with antepartum eclampsia and 1 patient with diabetes mellitus. This finding is in contrast to the study by Sundar Pal Singh et al, where frequency of pre eclampsia was 9 %.[11] In a study by PayalAnandbhai et al frequency of preeclampsia was 4.8% higher than reported in our study.[10]

In present study, none of the patient presented with chronic hypertension and only 1 patient with diabetes mellitus. This can be explained by younger age of grandmultiparae in our study.

Cesarean hysterectomy was done in one patient who presented with placenta accreta. Firstly intrauterine packing was done, but bleeding was not controlled and patient's vitals were started deteriorating, so total hysterectomy was performed to save the life of the mother. Patient's post recovery period was uneventful and she was discharged healthy. In study by Indrani Roy et al, cesarean hysterectomy was performed on 4 patients for rupture uterus[12].

Grandmultiparity is a predominant risk factor for postpartum hemorrhage. In our institute each of the delivery was conducted with active management of third stage of labour. No case of atonic postpartum hemorrhage was noted among grandmultiparae. ZainabMuniro et al also did not find a significant association between post-partum hemorrhage and grandmultiparity[8]. In contrast to our study, Charles Obinna reported that primary postpartum hemorrhage was significantly higher in grandmultiparous women as compared to multiparous women[14].

In present study there was no case of uterine rupture reported among grandmultipara. In contrast Hochler et al reported 14 cases of uterine rupture in grandmultiparae group with an incidence of 1 per 3855 labors in their study. However in their study grandmultiparous were older. They found that in a multivariable model controlling for maternal age , the association between grandmultiparity and uterine rupture lost its significance and maternal age emerged as an independent predictor of uterine rupture[15].In present study there was no maternal death reported among grandmultipara. In study by Indrani Roy et al also no maternal death was reported[12] while Sundar Pal Singh et al reported 4 maternal deaths in their study[13].In present study, 136(85.53 %) babies were born alive, 17 (10.69 %) patients presented with intrauterine fetal death on admission. Out of 17 patients with intrauterine fetal death, 1 patient presented at 28 weeks delivered vaginally a fetus of 900gm, the cause might be early onset intrauterine growth restriction,1 patient presented at 30 weeks with severe preeclampsia and abruption, 1 patient presented at 30 weeks with placenta previa, 2 patients presented at 41 weeks, 3 patients presented at term with placenta previa, and 3 patients at term presented with severe intrauterine growth restriction. A high number of unbooked patients who visited only an aanganwadi for tetanus immunization could explain the reason of this high percentage of intrauterine deaths found in our study. There were 6 (4.06 %) perinatal deaths (2 still birth and 4 early neonatal deaths) reported in our study. 2 pateints who had still birth, both presented with breech presentation with babies hanging outside the vagina with after coming head arrest,. Prematurity and

low birth weight were the main causes of early neotal deaths of 4 babies. Baidaa et al Reported in their study that the intrapartun stillbirth and early neonatal death were significant common adverse fetal outcome of grandmultiparous women[16].

In present study 25.78 % newborns were born with low birth weight. In contrast to this, in study by Satya Das et al only 4.7 % grandmultiparae delivered low birth weight babies[7].As our hospital has a well equipped neonatal ICU a high number of referred mothers with preterm labor and intrauterine growth restriction could explain the reason for this difference. In a study by Ghadeer K. Al-Shaikh et al neonatal complications identified were low birth weight (10.7 %), followed by neo-natal admission to the ICU (4 %), low APGAR score (1.5 %) and congenital anomalies (1.3 %).[4] In contrast to this, in study by MahaHussain et al there was no significant association between grand multipara and intrauterine fetal death and neonatal death[17].Limitation of our study is that it is a descriptive study. We found many adverse maternal and fetal outcome among grandmultiparaous women in our study but their association with grandmultiaprity can only be established by conducting an analytical case control study by selecting an appropriate age matched (as age may be a confounding variable) control group of low parity women. Also as this was a retrospective study, long term neonatal outcome of babies admitted in NICU was not available so could not be assessed.

Conclusion

Grandmultiparity is still an obstetric risk factor. Grandmultiparous women have high rates of suboptimal antenatal care. Proper antenatal care, timely referral, properly timed caesarean section in selected cases would reduce the grandmultiparity associated maternal morbidity and perinatal morbidity and mortality in our facility. Public awareness regarding increased risk of specific complications in women planning a fifth or later pregnancy, easy access to various methods of contraception, elimination of misconceptions and social taboos about family planning by involvement of the male partner in counseling and encouraging these couples for permanent methods of sterilization are some of the measures to be taken to avoid risk of grandmutliparity.

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