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GRAND-MULTIPARITY AND ITS FETO-MATERNAL OUTCOMES IN A TERTIARY CARE HOSPITAL

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ABSTRACT:

Background: In developed economies with excellent obstetric facilities, standard perinatal care and wholesome health-seeking behavior, the prevailing reports indicate that obstetric complications among grand multipara are now independently associated with progressive maternal age and not parity. Unlike the rich-resource settings with satisfactory outcomes in developed countries, where these confounders are either nonexistent or reduced to an insignificant level; in poor-resource settings, there are increased adverse obstetric outcomes in high parity pregnancy.

Methodology: All grand multiparous women who got admitted in the Obstetrics & Gynaecology Department of Government Medical College & Hospital, Jammu from November 2019 to October 2020 and fulfilled the inclusion criteria for the study, were taken as cases. They were compared with an equal number of primigravidas or multiparous women, who formed the control group, chosen by taking every next woman who got admitted after a grand multipara.

Results: Stratification of the study population according to age showed that grand multiparous females were more likely to be of advanced age with P-value <0.001, and therefore, significant. Grand multiparous women were more likely to deliver at an earlier gestational age. Most of the grand multiparous women (65.2%) in this study delivered vaginally. Majority of the patients in both the groups (59% in cases and 54.5% in controls) went into spontaneous labour. Out of all the complications, grand multiparas were more likely to develop severe anemia (p-value 0.005), gestational hypertension (p-value 0.028) and eclampsia (p-value 0.043) as compared to women with lower parity, with a significant difference. Grand multiparous women were more likely to have a lower Apgar score at 5 minutes (<7) compared to non-grand multiparas. The compound presentations seen in grand multiparas were hand prolapse (in 3 cases) and cord prolapse (in 3 cases). The other intra partum complications in the two groups were not of statistical significance. After comparing perinatal complications in cases and controls, it was found that cases were more likely to develop these complications, out of which preterm birth (p-value 0.019), intra uterine death (p-value0.003), early neonatal death (p-value 0.034) and low birth weight (p-value 0.031) were statistically significant.

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Conclusion: The present study shows that there is a significant increase in feto-maternal complications like anemia, hypertensive disorder, PPH, preterm deliveries, IUFD, etc. in these pregnancies, leading to severe morbidity in mother and fetus. Thus, there is a need for proper pregnancy evaluation, regular antenatal visits, intra partum care and post natal follow up to improve pregnancy outcome of all high risk pregnancies. In addition to this, we need to increase community awareness on its risks and encourage birth control among older women.

Introduction: Maternal and perinatal morbidity and mortality are major health problems in developing countries like India. Such is the magnitude of the problem that as per World Health Organization (WHO), 99% of all maternal deaths occur in developing countries (**Nour NM., 2008**).

There are certain categories of pregnancies where the mother and the fetus are at increased risk, and require extra attention and grand multiparity is one of them. Parity remains an important index in obstetric practice. The obstetric population is stratified using parity into nullipara, primipara, multipara, grand multipara and great grand multipara.

Grand multiparity is defined by the International Federation of Gynecology and Obstetrics (FIGO) as 5 deliveries or more, while the delivery of ten or more times is called great-grand multiparity (**Babinszki A *et al.*, 1999; Bai J *et al.*, 2002; Afolabi AF and Adeyemi AS, 2013; Njoku CO *et al.*, 2017**) and this is a serious risk factor for poor pregnancy outcome because of the associated consequences to the mother and the fetus (**Odukogbe AA *et al.*, 2001; Njoku CO *et al.*, 2017**).

The studies in the literature that associate high parity with increased maternal and fetal adverse outcomes are diverse in their findings. The differences in feto-maternal mortality by parity have been partly associated with lower health services coverage among the high parity births. It was observed that there was a trend toward lower utilization of maternal health services by mothers as the birth order increases, especially institutional delivery and skilled birth attendance (**Sonneveldt E *et al.*, 2013**). In addition, several confounders played out in the high parity literature. Most of such reports attributed adverse obstetric outcomes to high parity (**Mgaya AH *et al.*, 2013; Ogedengbe OK and Ogunmokun AA, 2003**). Meanwhile, socio-economic status, maternal age, nutritional status, standard of maternal health care, and health-seeking behavior are known to affect the obstetric performance. These factors operate at different degrees in different individual mothers and different settings, and in some cases, in combinations, to influence the obstetric outcome. Again, methodological differences are very important. For instance, some of the reports came from cross-sectional study that is weak in assessing causality (**Rizwan N *et al.*, 2009; Ogedengbe OK and Ogunmokun AA, 2003**).

In developed economies with excellent obstetric facilities, standard perinatal care and wholesome health-seeking behavior, the prevailing reports indicate that obstetric complications among grand multipara are now independently associated with progressive maternal age and not parity (**Kenny LC *et al.*, 2013**).

Unlike the rich-resource settings with satisfactory outcomes in developed countries, where these confounders are either nonexistent or reduced to an insignificant level; in poor-resource settings, there are increased adverse obstetric outcomes in high parity pregnancy.

Aims and objectives:

- To determine the prevalence of grand multiparity.
- To study the maternal outcomes of grand-multiparous pregnancies.
- To study the fetal outcomes of grand-multiparous pregnancies.

Materials and methods:

Study Design: Prospective case-control hospital-based study

- **Study Area:** After obtaining approval from the hospital ethical committee, the study was conducted in the department of Obstetrics and Gynecology of SMGS Hospital, Government Medical College, Jammu. It is a tertiary care hospital, run by government where medical care is given free of charge to pregnant women and it caters for the population of Jammu province.
- **Study Population:** All grand multiparous women who got admitted in the Obstetrics & Gynaecology Department of Government Medical College & Hospital, Jammu from November 2019 to October 2020 and fulfilled the inclusion criteria for the study, were taken as cases. They were compared with an equal number of primigravidas or multiparous women, who formed the control group, chosen by taking every next woman who got admitted after a grand multipara.
- **Inclusion Criteria:**
  - Woman with 5^{th} to 9^{th} pregnancy of more than 24 weeks of gestation was taken as a case.
  - Woman with 1^{st} to 4^{th} pregnancy of more than 24 weeks of gestation was taken as a control.
  - Willingness to participate in the study.
- **Exclusion Criteria:**
  - Woman with pre-existing medical conditions such as chronic hypertension, diabetes mellitus, cardiac disease, renal disease, connective tissue disorder, seizure disorder, etc.
  - Refusal to participate in the study.
- **Data Collection:** Detailed history was taken, and examination was done of cases and controls. Examination of the patient included GPE, examination of cardiovascular

system, respiratory system, per abdomen and per vaginum examination. Blood pressure was measured using the auscultatory method with a standard calibrated, validated instrument. An appropriate sized cuff was used to ensure accuracy, Korotkoff sound 5 was taken to measure diastolic BP. Routine antenatal investigation were done.

Paper medical records were used to ascertain women's medical status throughout the gestation. During labor, patients were managed according to hospital's protocol and partograph recordings were used to evaluate the progress of labor. The intrapartum complications including prolonged labor, intrapartum hemorrhage, uterine rupture and mode of delivery were also recorded. After delivery, information on birth weight, Apgar scores and admission to neonatal intensive care unit (NICU) were obtained. Patients were monitored for 24 hours for primary postpartum hemorrhage. Also, data on maternal mortality, stillbirth and fetal malformation were obtained. Length of stay in the hospital was noted. Then, these women were followed up six weeks after delivery.

- **Statistical Analysis**: The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Continuous variables were expressed as Mean± SD and categorical variables were summarized as percentages. Student's independent t-test was employed for comparing continuous variables. Chi-square test or Fisher's exact test, whichever appropriate, was used for comparison of categorical variables. Graphically the data was presented by bar diagrams. A P-value of less than 0.05 was considered statistically significant. All P-values were two tailed.

Observations and results:

The present observational prospective case- control study was conducted on all the grand multiparous women who got admitted in Government Medical College & Hospital, Jammu from November 2019 to October 2020 and fulfilled the inclusion criteria for the study. They were compared with an equal number of women with 1^{st} to 4^{th} viable pregnancy. The controls were chosen by taking every next woman who got admitted after a grand multipara. Following observations were made during the culmination of the study:

PREVALENCE OF GRAND MULTIPARITY

During the study period of 1 year, out of a total of 26,535 parturients in the labour room, 205 were grand multiparas. The prevalence of grand multiparity calculated was 0.77% (7.7725 per 1000 deliveries).

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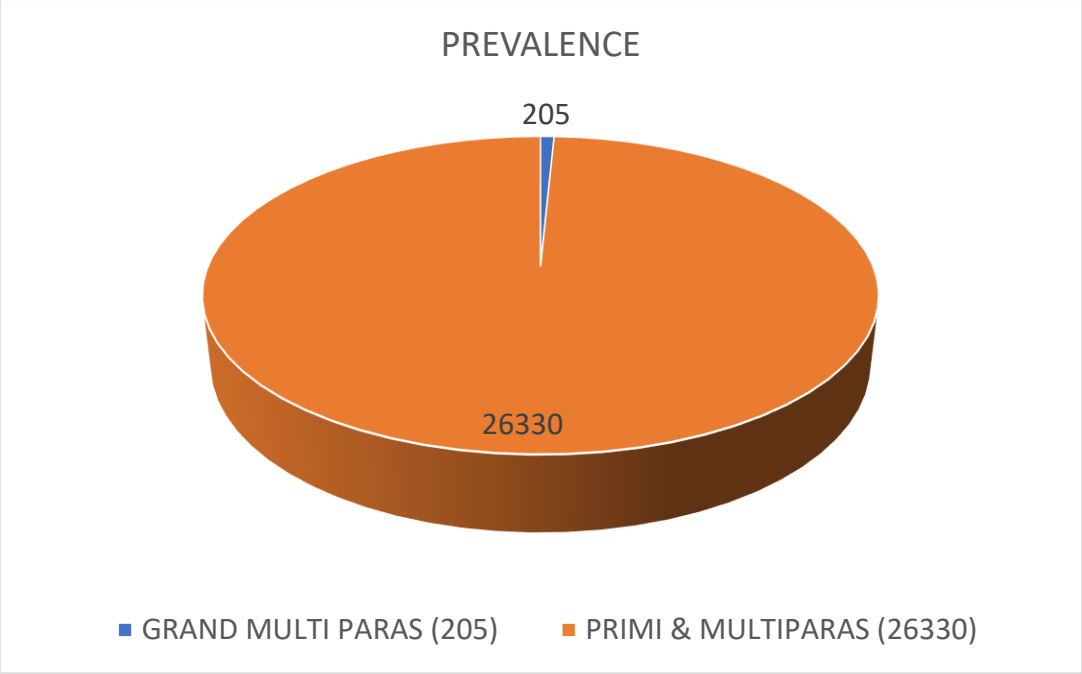

Figure 1 Pie Diagram showing prevalence of grand multi-parity

For the purpose of this study, only 187 grand multiparous women fulfilled the inclusion criteria. Therefore, only these cases were compared with 187 controls.

AGE DISTRIBUTION

The mean age of the grand-multiparous women was 31.6 ± 4.23 years, and that of non grand-multiparous control group was 26.2 ± 3.79 years. The ages of cases ranged from 21 to 42 years, while those of controls ranged from 20 to 41 years. Majority (69%) of females in cases were in the age group of 30-42 years, whereas most of (79.7%) the females in controls were in the age group of 20-29 years. Stratification of the study population according to age showed that grand multiparous females were more likely to be of advanced age with P-value <0.001, and therefore, significant.

Table 1: Age distribution of cases and controls

Age (Years)	Cases		Controls		P-value
	No.	%age	No.	%age	
20-24	9	4.8	62	33.2	<0.001*
25-29	49	26.2	87	46.5	
30-34	72	38.5	32	17.1	
≥ 35	57	30.5	6	3.2	
Total	187	100	187	100	
Mean ± SD (Range)	31.6±4.23 (20-42)		26.2±3.79 (20-41)		

Statistically Significant Difference (P-value<0.05)

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GESTATIONAL AGE AT THE TIME OF DELIVERY:

Grand multiparous women were more likely to deliver at an earlier gestational age as compared to women with lower parity, with a significant P-value of 0.004. The mean gestational age at delivery was 37.16 ± 3.282 weeks for cases and 38.24 ± 1.849 weeks for the controls.

Table 2: Gestational age at the time of delivery in cases and controls

Group	N	Mean	SD	Range	P-value
Cases	187	37.16	3.282	26-42	0.004*
Controls	187	38.24	1.849	31.9-41.9	

Statistically Significant Difference (P-value < 0.05)

ONSET OF LABOUR:

Majority of the patients in both the groups (59% in cases and 54.5% in controls) went into spontaneous labour, followed by those in which labour was induced (23% in cases, 22.5% in controls), patients for elective LSCS (12.8% in cases, 19.8% in controls) and who underwent emergency LSCS (4.3% in cases, 3.2% in controls). Mode of onset of labour was similar in both the groups.

Table 3: Mode of onset of labour in cases and controls

Mode of onset of labour	Cases		Controls		P-value
	No.	%age	No.	%age	
Spontaneous	112	59.9	102	54.5	0.316
Induced	43	23.0	42	22.5	
Elective LSCS	24	12.8	37	19.8	
Emergency LSCS	8	4.3	6	3.2	
Total	187	100	187	100	

MODE OF DELIVERY:

Most of the grand multiparous women (65.2%) in this study delivered vaginally, while in the control group, the most common mode of delivery was Caesarean section (58.3%). This difference showed a significant P-value of <0.001. One of the grand multiparous women had to undergo laparotomy for delivery with repair of uterine rupture and one required Caesarean hysterectomy for badly ruptured uterus.

Table 4: Mode of delivery in cases and controls

	Cases	Controls	P-value

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Mode of delivery	No.	%age	No.	%age	
Vaginal	122	65.2	78	41.7	<0.001*
C section	63	33.7	109	58.3	
Laparotomy	1	0.5	0	0.0	
Caesarean Hysterectomy	1	0.5	0	0.0	
Total	187	100	187	100	

***Statistically Significant Difference (P-value<0.05)**

ANTENATAL COMPLICATIONS:

Table 5. Antenatal Complications in cases & controls

Maternal complications	Cases		Controls		P-value
	No.	%age	No.	%age	
Severe anaemia	16	8.6	3	1.6	0.005*
Preterm labour	16	8.6	12	6.4	0.432
Cholestasis	2	1.1	8	4.3	0.109
PPROM	9	4.8	10	5.3	0.814
Gestational hypertension	19	10.2	8	4.3	0.028*
Pre-eclampsia	1	0.5	0	0.0	1.000
Imminent eclampsia	3	1.6	2	1.1	0.653
Eclampsia	8	4.3	1	0.5	0.043*
HELLP Syndrome	3	1.6	0	0.0	0.248
GDM	3	1.6	1	0.5	0.623
Placenta previa	4	2.1	2	1.1	0.681
Abruptio placentae	1	0.5	0	0.0	1.000
APH	3	1.6	2	1.1	0.653
Malpresentation	14	7.5	16	8.6	0.703
Multiple pregnancy	9	4.8	2	1.1	0.066
Oligohydramnios	12	6.4	9	4.8	0.501
Polyhydramnios	0	0.0	1	0.5	1.000

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Post Datism	22	11.76	18	9.63	0.503

Statistically Significant Difference (P-value<0.05)

The antenatal complications in cases and controls were compared. Out of all these complications, grand multiparas were more likely to develop severe anemia (p-value 0.005), gestational hypertension (p-value 0.028) and eclampsia (p-value 0.043) as compared to women with lower parity, with a significant difference. The comparison of other antenatal complications in the two groups did not reach a difference of statistical significance.

INTRA-PARTUM COMPLICATIONS:

Table 6. Intrapartum complications in cases & controls

Maternal complications	Cases		Controls		P-value
	No.	%age	No.	%age	
Failed induction	3	1.6	3	1.6	1.000
NPOL	6	3.2	3	1.6	0.498
Non descent at full dilatation	2	1.1	1	0.5	1.000
Compound Presentation	6	3.2	0	0.0	0.031*
Obstructed Labour	3	1.6	0	0.0	0.248
C-Section	67	35.83	78	41.71	0.243
Uterine rupture	3	1.6	0	0.0	0.248
Caesarean Hysterectomy	1	0.5	0	0.0	1.000

Statistically Significant Difference (P-value<0.05)

During labour, the grand multiparas were more likely to have compound presentation as compared to non-grand multiparas, with a significant p value of 0.031. The compound presentations seen in grand multiparas were hand prolapse (in 3 cases) and cord prolapse (in 3 cases). The other intra partum complications in the two groups were not of statistical significance. There were 3 cases of obstructed labour and 3 of uterine rupture in grand multiparas, and none in the control group.

POST-PARTUM COMPLICATIONS:

Table 7. Postpartum complications in cases & controls

Maternal complications	Cases		Controls		P-value
	No.	%age	No.	%age	
PPH	6	3.2	0	0.0	0.031*
Puerperial Sepsis	2	1.1	1	0.5	1.000

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Statistically Significant Difference (P-value<0.05)

In the post-partum period, the complication that happened more in grand multiparas was post-partum hemorrhage. The difference of incidence in the two groups was statistically significant with a p-value of 0.031. Puerperial sepsis, although seen more in grand multiparas did not show a significant difference in the two groups.

REQUIREMENT OF BLOOD

A marked difference was found in cases and controls with respect to the requirement of blood transfusion, with more of grand multiparous women requiring transfusions compared to their controls. The P-value calculated was highly significant <0.001.

Table 8. Requirement of blood transfusion in cases and controls

Blood transfusion	Cases		Controls		P-value
	No.	%age	No.	%age	
Given	26	13.9	6	3.2	<0.001*
Not given	161	86.1	181	96.8	
Total	187	100	187	100	

Statistically Significant Difference (P-value<0.05)

DURATION OF STAY IN THE HOSPITAL

Table 9. Duration of hospital stay in cases and controls

Hospital stay (Days)	Cases		Controls		P-value
	No.	%age	No.	%age	
< 3 Days	108	57.8	103	55.1	0.379
3-7 Days	70	37.4	83	44.4	
> 7 Days	9	4.8	1	0.5	
Total	187	100	187	100	
Mean ± SD (Range)	2.9±1.93 (1-14)		2.8±1.34 (1-8)		

Duration of stay in the hospital was not significantly different in cases and controls. In both the groups, most of the patients had to stay for less than 3 days (57.8% in cases and 55.1% in controls). Mean duration of stay in grand multiparas and non-grand multiparous women was 2.9 ± 1.93 days and 2.8 ± 1.34 days, respectively.

PERINATAL OUTCOME:

APGAR Score:

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With regard to neonatal outcome of cases and controls, the Apgar score at 1st minute of birth was compared. The grand multiparas were more likely to have a lower APGAR (<7) at 1st minute, as compared to women with lower parity. This difference in outcome was statistically highly significant with P-value <0.001. The mean value of 1st minute Apgar score in cases and controls was 8.7 ± 2.15 and 9.5 ± 1.27 respectively.

Table 10. APGAR score at 1 minute in cases and controls

APGAR score	Cases		Controls		P-value
	No.	%age	No.	%age	
< 7	22	13.1	8	4.4	<0.001*
≥ 7	146	86.9	175	95.6	
Total	168	100	183	100	
Mean ± SD (Range)	8.7±2.15 (2-10)		9.5±1.27 (2-10)		

Statistically Significant Difference (P-value<0.05)

Grand multiparous women were more likely to have a lower Apgar score at 5 minutes (<7) compared to non-grand multiparas, with a highly significant P-value of <0.001.

Table 11. APGAR score at 5 minutes in cases and controls

APGAR score	Cases		Controls		P-value
	No.	%age	No.	%age	
< 7	18	10.7	4	2.2	<0.001*
≥ 7	150	89.3	179	97.8	
Total	168	100	183	100	
Mean±SD (Range)	8.9±1.98 (2-10)		9.7±1.13 (2-10)		

Statistically Significant Difference (P-value<0.05)

BIRTH WEIGHT:

Table 12. Birth weight (kg) of neonates in cases and controls

Birth weight (Kg)	N	Mean	SD	Range	P-value
Cases	187	2.76	0.659	0.7-4.5	0.439
Controls	187	2.81	0.469	1.5-4.5	

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Birth weight was comparable in cases and controls, and there was no significant difference between the two groups. Mean birth weight in cases was 2.76 ± 0.659 kg and in controls was 2.81 ± 0.469 kg.

PERINATAL COMPLICATIONS:

Table 13. Perinatal Complications in cases & controls

Perinatal complications	Cases		Controls		P-value
	No.	%age	No.	%age	
Preterm	46	24.6	28	15.0	0.019*
IUFD	19	10.2	4	2.1	0.003*
Early Neonatal Death	14	7.5	5	2.7	0.034*
ARDS	7	3.7	4	2.1	0.541
MAS	6	3.2	3	1.6	0.498
Macrosomia	10	5.3	4	2.1	0.173
LBW	31	16.6	17	9.1	0.031*
Neonatal Jaundice	7	3.7	2	1.1	0.177
IUGR	6	3.2	8	4.3	0.586

Statistically Significant Difference (P-value<0.05)

After comparing perinatal complications in cases and controls, it was found that cases were more likely to develop these complications, out of which preterm birth (p-value 0.019), intra uterine death (p-value0.003), early neonatal death (p-value 0.034) and low birth weight (p-value 0.031) were statistically significant.

ADMISSION IN NEONATAL ICU:

Table14. NICU admission in babies of cases and controls

NICU admission	Cases		Controls		P-value
	No.	%age	No.	%age	
Yes	32	17.1	18	9.6	0.034*
No	155	82.9	169	90.4	
Total	187	100	187	100	

Statistically Significant Difference (P-value<0.05)

Neonatal ICU admissions were required more in grand multiparous women as compared to non-grand multiparas, with a statistically significant p-value of 0.034.

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DURATION OF STAY IN NEONATAL ICU:

Table 15. Duration of stay in NICU among cases and controls				
Duration of stay in NICU (Days)	**Mean**	**SD**	**Range**	**P-value**
Cases	5.1	4.91	1-18	0.697
Controls	4.5	3.26	1-12	

Duration of stay in NICU, of cases and controls was compared and there was no statistically significant difference between the two. The mean duration of stay in NICU was longer for neonates of grand multiparas (5.1 days) than of non-grand multiparas (4.5 days).

Discussion: This study was a prospective case control study, comparing obstetric and neonatal outcomes between grand multiparas and women with lower parity, who were delivered in the Department of Obstetrics & Gynaecology in Government Medical College, Jammu.

The prevalence of grand multiparity calculated in this study was 0.77%. This is concordant with the 0.72% prevalence found in the study conducted by **Roy R and Vernekar M (2017)** in Kolkata. However, **Lal R *et al.*, (2015)** calculated a higher prevalence of 5.08% in Jharkhand.

Prevalence of grand multiparity from African and Middle East countries is much higher, as seen in studies by **Muniro Z *et al.*, (2019)**, **Ajong AB *et al.*, (2019)** and **Alhainiah MH *et al.*, (2018)** to be 9.44%, 27% and 31.7%, respectively**.** This can be explained by the difference in cultural, socio economic and educational backgrounds. Also, adoption of family planning methods, Government encouragement towards small family norm and National Health Mission propaganda in India could have been the cause for a lower prevalence in our study. Another plausible explanation can be the overall decreased admission rate during the study period because of COVID-19 pandemic.

The mean age of study population in this study was 31.6 ± 4.23 years, as compared to 26.2 ± 3.79 years in controls (Table 1). Most of the cases (69%) were in the age group of 30-42 years and most of the (79.7%) controls were in the age group of 20-29 years.

Ajong AB *et al.*, (2019) found that the mean age of cases was 33.4 ± 5.0 years and of controls was 23.2 ± 4.6 years. **Lal R *et al.*, (2015)** found the mean age to be 30 years in cases and 25 years in controls. The mean age found by **Teguete I *et al.*, (2012)** was 34.1 and 26.1 years in cases and controls respectively**.** In all these studies, the grand multiparas were found to be significantly older than controls, which can be expected due to their higher parity. Our study results, with respect to differences in ages of grand multiparas and non-grand multiparas, were consistent with all these studies.

Grand multiparas were found to deliver at a significantly lower gestational age compared to non-grand multiparas, in this study. The mean gestational age at delivery was 37.16 ± 3.282 weeks for cases and 38.24 ± 1.849 weeks for controls, with a significant P-value (Table 2).

Studies conducted by **Alhainiah MH *et al.*, (2018)**, **Al-Shaikh GK *et al.*, (2017)** and **Njoku CO *et al.*, (2017)** found that the mean gestational age at delivery of grand multiparas was lower than that of women with lower parity, but none among them showed a significant P-value. However, **Alsammani MA and Ahmed SR (2015)** found a significant P-value of 0.001, where the mean gestational ages of cases and controls were 38.4556 ± 1.75 and 38.0695 ± 2.00 weeks respectively, which is in accordance to our study.

The mode of onset of labour in our study was similar in the two groups, with majority of patients going into spontaneous labour (59.9% in cases and 54.5% in controls) followed by those in whom labour was induced (23% in cases and 22.5% in controls), as seen in Table 3. Majority (65.2%) cases delivered vaginally while majority (58.3%) controls delivered by Caesarean section, with a statistically significant difference (Table 4).

Similar result was seen by **Al-Shaikh GK *et al.*, (2017)** with P-value <0.01 where cases were less likely to deliver by Caesarean section. **Akhtar R *et al.*, (2017)** also found vaginal delivery to be the most common mode of delivery in grand multiparas, where 79.12% delivered vaginally and 17.06% underwent C-section. **Eugene MI and Abedinego OA (2019)** and **Ajong AB *et al.*, (2019)** found a lower incidence of Caesarean section in cases but P-value was not significant for comparison with controls.

In contrast to this, **Smith K and Philips R (2019)** found a higher risk of Caesarean section in grand multiparas (P-value 0.032). Also, **Alhainiah MH *et al.*, (2018)** and **Njoku CO *et al.*, (2017)** found a higher incidence of C-section in cases, but none among them could reach a significant P-value.

The most significant antenatal complication seen more in grand multiparous women as compared to women with lower parity, in this study, was severe anemia (Hb <7 gm.%). The P-value calculated was 0.005 (Table 5).

Most of the previous studies on grand multiparity have found a significant association of grand multiparity with anemia. **Smith K and Philips R (2019)**, **Roy R and Vernekar M (2017)** and **Akhtar R *et al.*, (2017)** found anemia as the commonest antenatal complication in 47.1%, 59.1% and 70.15% grand multiparous subjects respectively. Also, **Shechter Y *et al.*, (2010)** found a linear association between parity and anemia. This may be attributed to the significant amount of blood loss during each delivery.

Our study found an increased risk of gestational hypertension and eclampsia in grand multiparous women, with significant association. Overall, a higher incidence of all hypertensive disorders of pregnancy was found in cases in comparison to controls.

Our result was consistent with **Smith K and Philips R (2019)** and **Al-Shaikh GK *et al.*, (2017)**. **Lal R *et al.*, (2015)** also found a higher incidence of hypertension in grand

multiparas as compared to non-grand multiparas (43% vs. 14%). Gestational hypertension was the second most common complication seen in cases by **Akhtar R *et al.*, (2017)**, whereas PIH, pre-eclampsia and eclampsia together formed the second most common complication seen in grand multiparas, by **Roy R and Vernekar M (2017)**. Similarly, **Ahmed IAM (2013)** compared grand multiparas with multiparas and found a significantly higher risk of hypertensive disorders of pregnancy, in grand multiparas.

Mgaya AH *et al.*, (2013) found the prevalence of hypertension to be higher in grand multiparas but without significant differences when adjusted for age.

Besides anemia and hypertension, the other antenatal complications were not significantly associated with grand multiparity in our study. These complications included preterm labour, cholestasis, PPROM, GDM, placenta previa, abruption placentae, APH, malpresentation, multiple pregnancy, oligohydramnios, polyhydramnios and post datism. Although multiple pregnancy was seen more in cases than controls, but the difference did not reach statistical significance.

There are many conflicting reports on complications in high parity pregnancies. **Muniro Z *et al.*, (2019)** reported a significant association of prelabour rupture of membranes with grand multiparity. In contrast to this, **Alhainiah MH *et al.*, (2018)** reported a higher incidence of PROM in primiparas compared to grand multiparas while preterm labour was found equally in both the groups.

Al-Shaikh GK *et al.*, (2017) and **Mgaya AH *et al.*, (2013)** saw GDM more frequently in grand multiparas. However, in regression models controlling for age, grand multiparity was not associated with higher risk of gestational diabetes. This was in accordance with our study. **Shahida SM *et al.*, (2011)** found a significantly higher incidence of gestational diabetes in grand multiparas (12% vs. 2%).

Alhainiah MH *et al.*, (2018) reported placenta previa and abruptio placentae more commonly in grand multiparas but without statistical significance. **Njoku CO *et al.*, (2017)** found the incidence of antepartum hemorrhage to be comparable between the two groups. Similar findings were supported by our study.

Ahmed IAM (2013) reported a significantly higher incidence of breech presentation and transverse lie in grand multiparas as compared to multiparas. **Eugene and Abedinego OA (2019)** also found a higher risk of fetal abnormal lie in grand multiparas. However, this study did not find any difference in the cases and controls with respect to malpresentations. Results, similar to our study, were seen by **Simonsen SM *et al.*, (2015)**.

Roy R and Vernekar M (2017) found an incidence of 3.6% of twin pregnancies in grand multiparas and oligohydramnios as the third most common complication. However, our study did not find any significant association of multiple pregnancies and amniotic fluid disorders with parity. This may be explained by the small sample size in our study.

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Among the intrapartum complications, our study found significantly high risk of compound presentations in cases (Table 6). The compound presentations seen were hand prolapse, in 3 cases, and cord prolapse, in 3 cases.

Three cases and none among controls reported with obstructed labour to our hospital, but results were not significantly associated with grand multiparity. All these cases had taken a trial of labour outside the hospital and later presented with obstructed labour due to cephalo-pelvic disproportion. In congruence with this, no significant association of cephalo-pelvic disproportion/ obstructed labour with parity was seen by **Eugene MI and Abedinego OA, (2019)**.

Three cases were admitted with uterine rupture. One among them had to undergo Caesarean hysterectomy and two were repaired. Probably due to a small scale design with inability to capture rare adverse events, this difference in the cases and controls of obstructed labour and uterine rupture did not reach a statistical significance. Rupture of uterus was quite frequently seen in grand multiparas as compared to control group (15% vs. 1%) by **Lal R *et al.*, (2015)**.

Grand multiparous women were more prone to post-partum hemorrhage in this study, with a significant P-value of 0.031 (Table 7). **Smith K and Philips R (2019), Alhainiah MH *et al.*, (2018)** and **Njoku CO *et al.*, (2017)** also found PPH more frequently in grand multiparas. **Munim S *et al.*, (2000)** found a three times higher risk of PPH in cases as compared to controls.

This may be attributable to unstable gravid uterus due to lax anterior abdominal wall and uterine muscles from repeated pregnancies and overstretching of the muscles by the enlarged gravid uterus.

Contradictory to our study, **Muniro Z *et al.*, (2019)** and **Ajong AB *et al.*, (2019)** did not find any significant association of PPH with grand multiparity.

Puerperial sepsis was seen comparably in both the groups in this study, similar to the findings by **Njoku CO *et al.*, (2017)**.

A highly significant association of grand multiparous women was found with the need for blood transfusions (Table 8). This can be explained by a high incidence of anemia in the cases, with further blood loss in repeated deliveries, and a high frequency of post-partum hemorrhage seen in them. In the study done by **Smith K and Philips R (2019)**, around 45.1% of the grand multiparous women received blood transfusion which gave a significant association of parity with the need for blood transfusions.

Both the cases and controls had a similar duration of around 3 days of stay in the hospital in the current study (Table 9). Most of the cases in the study by **Roy R and Vernekar M (2017)** had a stay of around 5 days. Thus, both the groups required almost same duration of hospital care.

There was no maternal death reported in any of the two groups of our study.

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Apgar scores of neonates at 1st and 5th minutes were compared in the cases and controls and a significantly lower Apgar score was found in cases in this study (Table 10 & 11). Also, grand multiparous women were more likely to deliver babies with a low Apgar score (<7) as compared to non-grand multiparous women.

Mgaya AH *et al.*, (2013) concluded in his study that neonates delivered by grand multiparous women were at three times greater risk of a low Apgar score compared with lower parity women. **Severinski N *et al.*, (2009)** found a significantly higher incidence of low Apgar scores at 1 and 5 minutes in cases. Similarly, **Munim S *et al.*, (2000)** reported significantly low five-minute Apgar scores in the cases as compared to controls. This was concordant with our study results.

Unlike our result of Apgar score comparison, **Alhainiah MH *et al.*, (2018)** did not find any significant difference in the two groups.

Another parameter used to compare perinatal outcome in this study was birth weight, which was found similar in the two groups. The mean birth weights of neonates of cases and controls was 2.76 ± 0.659 kg and 2.81 ± 0.469 kg, respectively (Table 12).

In contrast to this, **Alhainiah MH *et al.*, (2018)** concluded that the average of the fetal weight of the newborn of grand multiparas was 6.067±0.710 kg, which were heavier than those of controls and statistically significant with a p-value < 0.001. This may be attributed to a high incidence of gestational diabetes found in cases in this study.

Among the various perinatal complications compared between the two groups, the neonates of cases, as compared to those of controls, were found to have a significantly higher risk of prematurity, intra-uterine death, early neonatal death and low birth weight (Table 13).

The most significantly associated perinatal complication with grand multiparas in our study was intra-uterine death, with a P-value of 0.003. 19 grand multiparous women were admitted to the hospital with IUFDs during the study period. Such a high number of IUFDs may be attributed to the casual approach of most of the grand multiparas towards pregnancy and its possible complications, their lack of education and poor antenatal care.

In congruence to this, **Muniro Z *et al.*, (2019)** demonstrated that grand multiparas had a higher risk of experiencing still births and preterm births as compared to women with lower parity. **Hoque M *et al.*, (2008)** also found a higher risk of intra-uterine fetal deaths in grand multiparas**.** However, **Eugene MI and Abedinego OA (2019)** did not find any significant association between the two.

Another important perinatal complication found significantly associated with grand multiparity in our study was early neonatal death. This can be linked to the lower Apgar scores found in neonates of cases. Early neonatal demise has also been reported by **Ajong AB *et al.*, (2019)** to be more frequently seen in cases than in controls. **Rizwan N *et al.*, (2009)** also noted a high incidence (35%) of perinatal deaths in GMPs.

Grand multiparous women in our study also had a higher incidence of preterm deliveries, with a significant P-value of 0.019. Some among them had gone into spontaneous preterm labour, some had spontaneous preterm rupture of membranes which was followed by induction of labour, and some had to be delivered prematurely in emergency because of complications. Similar results were seen by **Babinszki A *et al.*, (1999)**. Unlike our results, **AlKadri H *et al.*, (2016)** and **Omole-Ohonsi A and Ashimi AO (2009)** demonstrated no significant association between high parity and preterm births.

Low birth weight was another perinatal complication found significantly more frequent in cases in this study. A plausible explanation to this can be a high incidence of preterm births in cases of our study. **Eugene MI and Abedinego OA (2019)**, however, did not find any significant association of LBW with grand multiparity. Also, **Al-Shaikh GK *et al.*, (2017)** conversely found a higher association of LBW with primiparas as compared to grand multiparas.

Our study did not find any significant association of macrosomia with cases, which was in accordance to the study done by **Eugene and Abedinego OA (2019)**. Also, intra-uterine growth retardation was found almost equally in both the groups of our study, which showed similarity with results of **Alhainiah MH *et al.*, (2018)**.

Neonatal ICU admission was more frequently required for neonates of grand multiparous women as compared to lower parity women, in our study. This difference had a significant P-value of 0.034 (Table 14). The mean duration of stay in NICU was longer in neonates of cases than those of controls but it wasn't statistically significant (Table 15). Similar to this, neonatal admission to ICU was significantly higher in cases than controls in the study by **Al-Shaikh GK *et al.*, (2017)**. **Munim S *et al.*, (2000)** also found a higher rate of NICU admission in cases but the difference was not significant statistically.

CONCLUSION:

Present study shows that there is a significant increase in feto-maternal complications like anemia, hypertensive disorder, PPH, preterm deliveries, IUFD, etc. in these pregnancies, leading to severe morbidity in mother and fetus. Thus, there is a need for proper pregnancy evaluation, regular antenatal visits, intra partum care and post natal follow up to improve pregnancy outcome of all high risk pregnancies. In addition to this, we need to increase community awareness on its risks and encourage birth control among older women. Hospitals should be prepared and well equipped for emergency situation that can arise when attending deliveries of high parity group. Enhancement of existing government policies on reproductive and sexual health are needed to curb potential socioeconomic burden of grand multiparity in rural areas.

More studies, preferably with large enough sample sizes are recommended to validate these preliminary findings and evaluate adverse outcomes of grand multiparous deliveries.

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