

ORIGINAL RESEARCH

Foetal outcome according to the weeks of gestation in spontaneous vaginal delivery at term

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ABSTRACT

Background: Pregnancy is defined as term between 37 weeks 0 days and 41 weeks 6 days. Recent evidence indicates that infants delivered at 37 and 38 weeks' gestation, are at an increased risk for morbidity compared to infants delivered at 39 weeks. The aim of this study is to assess the foetal outcome according to the weeks of gestation in spontaneous vaginal delivery occurring between 37 weeks to 42 completed weeks of gestation. **Materials and methods:** This prospective Observational study was conducted in postgraduate department of Obstetrics and Gynecology at SMGS Hospital, GMC Jammu over a period of one year. All women who underwent spontaneous vaginal delivery and satisfied the inclusion and exclusion criteria were included in the study. **Results:** Out of 250 patients who delivered spontaneously between 37 to 42 weeks, it was observed that the foetal outcome was the best among patients who delivered between 39-40 weeks of gestation. Their average birth weight (3.12 kg) and apgar score (9.86) was the highest while nicu admission rate (3.6%) was the lowest as compared to those who delivered before and after them. **Conclusion:** These results suggest that the likelihood of foetal morbidity varies between early term and full term. It is best to avoid elective LSCS or unnecessary labour induction before 39 weeks in order to achieve the best foetal outcome.

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INTRODUCTION

The time between conception and delivery is referred to as gestation. The baby grows and develops inside the mother's womb throughout this time. The International Classification of Diseases defines term pregnancy as delivery between 37 weeks 0 days and 41 weeks 6 days. Subsequently, the American College of Obstetrics and Gynecology (ACOG), the National Institute of Child Health and Human Development, the American Academy of Pediatrics, the Society for Maternal-Fetal Medicine (SMFM), the March of Dimes, and the World Health Organization recommended replacing the use of "term" with the following gestational age designations.

Recommended classification of term gestation

- Early Term: 37 Weeks through 38 weeks and 6 days
- Full Term: 39 weeks through 40 weeks and 6 days
- Late Term: 41 weeks through 41 weeks and 6 days
- Post Term: 42 weeks and beyond.

Recent evidence indicates that neonatal morbidity decreases with delivery at later gestational ages and that infants delivered at 37 and 38 weeks' gestation are at increased risk of morbidity compared to infants delivered at 39 weeks. Specifically, rates of respiratory distress syndrome, transient Tachypnea of the newborn, pneumonia, hypothermia, and feeding difficulties are increased in infants born at 37 to 38 weeks compared to infants born after 38 weeks. To offer the best medical care for both mother and foetus, a gestational age must be determined for each pregnancy. To determine the gestational age more precisely, a combination of the history, physical examination, early sonography in the first trimester, and prenatal exams are necessary. The term "spontaneous vaginal delivery" (SVD) refers to the birth of a baby through the birth canal without the use of forceps, vacuum extraction or a caesarean section. It takes place when a pregnant woman enters labour naturally without the use of medicines or other methods to induce labour.

AIMS & OBJECTIVES

To study the foetal outcome according to the weeks of gestation in spontaneous vaginal delivery occurring between 37 weeks to 42 completed weeks of gestation.

MATERIALS & METHODS

This prospective Observational study was undertaken on women admitted in postgraduate department of Obstetrics and Gynecology at SMGS Hospital, GMC Jammu over a period of one year (w.e.f from 1st Nov 2021 to 31st Oct 2022) after proper institutional ethical approval.

INCLUSION CRITERIA

Women who spontaneously delivered singleton cephalic foetus vaginally, in between 37 weeks to 42 completed weeks.

EXCLUSION CRITERIA

- Induced or Assisted deliveries.
- Pregnancy before 37/0 or after 41/6 gestational weeks.
- Pregnancies with antenatal complications such as gestational diabetes mellitus, gestational hypertension, cardiac disease, etc.
- Multifetal gestation.

- Congenital anomalies.
- Still births.
- Malpresentation.
- Diagnosed fetal growth restriction.
- Women refusing to participate in the study.

All women with term singleton pregnancy, fulfilling the inclusion criteria were enrolled in the study after informed consent. All women underwent general, systemic & obstetrical examination including evaluation by ultrasound for placental localization, assessment of liquor and rule out any fetal compromise. Foetal outcome in terms of birth weight, APGAR score at 1 minute and NICU admissions were noted, and were analyzed according to the weeks of gestation at delivery and entered into a data base. The NICU admissions within the first 48 hours of birth were taken into consideration. The average fetal weight and percentage of NICU admissions were calculated by every week of gestation at which the delivery took place.

Statistical Methods: 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). Continuous variables were expressed as Mean±SD and categorical variables were summarized as frequencies and percentages.

RESULTS

Age (Years)	Number	Percentage
20-24 Years	114	45.6
25-29 Years	95	38.0
30-34 Years	32	12.8
≥ 35 Years	9	3.6
Total	250	100
Mean±SD (Range)=25.6±3.85 (20-38 Years)		

We observed that with an average age of (25.6±3.85) years, the age of studied patients was ranging from 20 to 38 years. Majority of patients (45.6%) were belonging to the age group of (20-24) years.

Gravida	Number	Percentage
Primi gravida	110	44.0
Gravida 2	87	34.8
Gravida 3	43	17.2
Gravida 4 and above	10	4.0
Total	250	100

We observed that majority of patients (44%) were primi gravida, followed by 34.8% with gravida 2 status, 17.2% with gravida 3 status and only 4% with gravida 4 and above.

Gestational age (Weeks)	Number	Percentage
37-38 Weeks	44	17.6
38-39 Weeks	64	25.6
39-40 Weeks	83	33.2
40-41 Weeks	49	19.6
41-42 Weeks	10	4.0
Total	250	100
Mean±SD=39.1±1.03		

We observed that average gestational age of studied patients was (39.1±1.03) weeks, with majority of patients (33.2%) having 39-40 weeks of gestational age, followed by 25.6% with 38-39 weeks gestational age, 19.6% with 40-41 weeks of gestational age and only 4% patients with 41-42 weeks of gestational age.

Gestational age (Weeks)	N	Mean	SD	95% CI for Mean
37-38 Weeks	44	2.68	0.307	2.59-2.83
38-39 Weeks	64	2.87	0.406	2.78-3.02
39-40 Weeks	83	3.12	0.367	2.93-3.09
40-41 Weeks	49	3.04	0.473	2.89-3.23
41-42 Weeks	10	2.79	0.271	2.61-2.98

CI: Confidence Interval

We observed that for patients with 39-40 weeks of gestational age, the average birth weight of neonates was 3.12 kg, and for the patients with gestational age 40-41 weeks, the mean birth weight of neonates was 3.04 kg. The average birth weight of neonates was 2.87 kg, 2.79 kg and 2.68 kg for patients with gestational age 38-39 years, 41-42 years and 37-38 weeks respectively.

Gestational age (Weeks)	N	Mean	SD	95% CI for Mean
37-38 Weeks	44	9.25	1.334	8.91-9.62
38-39 Weeks	64	9.59	1.019	9.34-9.85
39-40 Weeks	83	9.86	0.508	9.71-10.0
40-41 Weeks	49	9.64	0.698	9.42-9.93
41-42 Weeks	10	9.18	1.398	8.78-9.52

CI: Confidence Interval

The average APGAR score at 1 minute as per the gestational age was assessed wherein we found that mean APGAR score for patients with gestational ages 39-40 weeks, 40-41 weeks, 38-39 weeks, 41-42 weeks and 37-38 weeks respectively had their mean APGAR scores of 9.86, 9.64, 9.59, 9.25 and 9.18.

Gestational age (Weeks)	No. of patients	NICU Admission	
		N	%
37-38 Weeks	44	3	6.8
38-39 Weeks	64	4	6.3
39-40 Weeks	83	3	3.6
40-41 Weeks	49	3	6.1
41-42 Weeks	10	1	10.0
Total	250	14	5.6

The NICU admission rate with respect to gestational age was assessed wherein we found that 10% admission rate was evident for patients with gestational age (41-42) weeks, followed by 6.8% admission rate among patients with gestational age 37-38 weeks and 6.3% admission rate for patients with 38-39 weeks of gestational age. The minimum NICU admission rate of 3.6% was found in patients with gestational age 39-40 weeks.

DISCUSSION

In our study, majority of patients (45.6%) were belonging to the age group of (20-24) years, followed by 38% patients with age 25-29 years which is comparable to the study by **Jani et al** in which the majority of their patients were belonging to the age group of 21-24 years.

In the present study, we observed that majority of our patients (44%) were primi gravida, followed by 34.8% with gravida 2 status, 17.2% with gravida 3 status and only 4% with gravida 4 and above.

Studies on the association between high parity and adverse pregnancy outcomes show conflicting results. A number of studies have reported an association between high parity and adverse pregnancy outcomes (**Auger et al and Bai et al**). In contrast, other studies

state that, under satisfactory socioeconomic and health care conditions, high parity should not be considered as a risk factor for adverse pregnancy outcomes (**Jacquemyn et al**).

In the present study we have evaluated the gestational age among patients with spontaneous vaginal deliveries and found that average gestational age of studied patients was (39.1±1.03) weeks, with majority of patients having 39-40 weeks of gestational age, followed by 25.6% with 38-39 weeks gestational age, 19.6% with 40-41 weeks of gestational age and only 4% patients with 41-42 weeks of gestational age. Contemporary to this; **Tilstra et al**, in their study have reported that the modal gestational age of spontaneous vaginal births has shifted down from week 40 in 1990 to week 39 in 2013. Births became

much less likely to occur above gestational week 40 and much more likely to occur during weeks 37–39 (**Tilstra et al**).

In our study, The mean birth weight of neonates was 3.12 kg for patients with gestational ages of 39 to 40 weeks and 3.04 kg for patients with gestational ages of 40 to 41 weeks. The average birth weight of newborns for patients with gestational ages of 38–39 weeks, 41–42 weeks, and 37–38 weeks was 2.87 kg, 2.79 kg, and 2.68 kg respectively. In a study by **Jani et al**, the authors reported that the average birth weight grew as the gestational weeks at the time of the spontaneous delivery increased. In the 36th, 37th, and 38th weeks of pregnancy, newborns had an average birth weight of 2.314 kg, 2.623 kg, and 2.704 kg, respectively. The average birth weight of infants delivered between 39 and 40 weeks was 2.729 kg, likewise to our study, the feasible weight of neonates in their study was corresponding to 39-40 weeks of gestational age which is consonance with our study (**Jani et al**).

In the present study, patients with gestational ages of 39 to 40 weeks, 40 to 41 weeks, 38 to 39 weeks, 41 to 42 weeks, and 37 to 38 weeks had mean APGAR scores of 9.86, 9.64, 9.59, 9.25, and 9.18, respectively. Evidently, the APGAR score among neonates was having an increasing trend with rising gestational age of their mothers up to 39-40 weeks of gestation, however, average APGAR score showed a declining trend beyond 39 weeks of gestation.

In our study, The NICU admission rate with respect to gestational age revealed that 10% admission rate was evident for patients with gestational age (41-42) weeks, followed by 6.8% admission rate among patients with gestational age 37-38 weeks, and 6.3% admission rate for patients with 38-39 weeks of gestational age. 14.28% of the infants born in the 36th week of pregnancy were given NICU admissions. 4.705% and 4.347%, respectively, of the infants delivered in the 37th and 38th weeks of pregnancy, were placed in the NICU. Around 3.225% of infants born between 39 and 40 weeks and days were hospitalized to the neonatal intensive care unit, these results are comparable with our study (**Jani et al**).

We could not relate the results of our study to multiple studies because to the best of our knowledge there is a dearth of studies on the neonatal outcome among patients spontaneous vaginal delivery occurring between 36 completed weeks to 42 weeks. However, our comprehensive statistical analysis

corroborated with the results of (**Jani et al**) strongly suggest that the optimal gestational age for best and optimal neonatal outcomes is 39-40 weeks.

CONCLUSION

The present study demonstrated that the optimal gestational age for majority of spontaneous vaginal births with ideal neonatal birth weight, optimal APGAR score and least NICU admission rate was 39-40 weeks. These results suggest that the likelihood of foetal morbidity varies between early term and full term. It is best to avoid elective LSCS or unnecessary labour induction before 39 weeks. When it comes to elective deliveries, it is advisable to hold off until the baby is 39 weeks or until full term, unless there is a risk to the mother's or the infant's health.

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