394 Timing of delivery in women with vasa previa: A decision analysis

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OBJECTIVE: Prior studies have suggested that the optimal timing for delivery in pregnancies with vasa previa is in the late preterm period. However, these recommendations are based upon evidence from small studies. The purpose of the current study is to determine the optimal gestational age (GA) at which to deliver pregnancies complicated by vasa previa and examine how varying baseline assumptions would affect this decision.

STUDY DESIGN: A decision-analytic model was built using TreeAge software to compare the outcomes of strategies of planned delivery at 32-37 weeks' gestation in a theoretical cohort of 10,000 women diagnosed with vasa previa. Strategies involving expectant management until a later GA accounted for the risks of premature rupture of membranes (PROM), bleeding following PROM, spontaneous labor, and stillbirth during each successive week. GA- associated risks of neonatal complications included neonatal death and cerebral palsy and considered the reduction in risk afforded by antenatal corticosteroids. The risk of intrapartum death according to time from PROM or onset of labor to delivery was also incorporated. Probabilities and utilities were derived from the literature and total quality-adjusted life years (QALYs) were calculated. Univariate sensitivity analyses were used to vary model inputs to investigate the robustness of our baseline assumptions. We assumed a 28.0% baseline rate of bleeding following PROM.

RESULTS: In our theoretical cohort of 10,000 women, delivery at 36 weeks maximized maternal and neonatal QALYs. Compared to 34 weeks' gestation, delivery at 36 weeks would result in 47.3 fewer children with cerebral palsy, but 18.9 more stillbirths (Table 1). Univariate sensitivity analysis found that delivery at 36 weeks remained the optimal strategy until the probability of bleeding with PROM fell below 0.07, at which point 37 weeks became optimal (Figure 1). Monte Carlo Analysis demonstrated that when variation was incorporated into the model, delivery at 36 weeks was the dominant strategy 79% of the time.

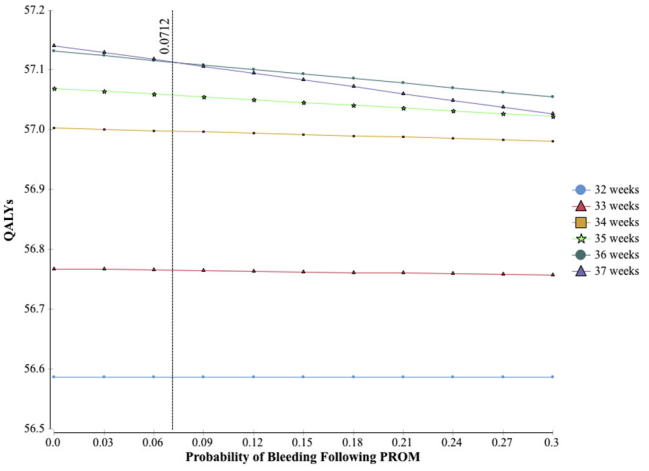
CONCLUSION: When weighing the risks of intrapartum mortality against GA-associated neonatal complications, the optimal time for delivery in women with vasa previa is at 36 weeks.

Table 1: Outcomes In A Theoretic Cohort of 10,000 Women With Vasa Previa

	32 Weeks	33 Weeks	34 Weeks	35 Weeks	36 Weeks	37 Weeks
QALYs	565860	567580	569830	570250	570400	570330
Stillbirth	0	4.27	9.21	17.9	28.1	40.7
Cerebral Palsy	135	74.2	52.4	31.6	5.09	4.97
Neonatal Death	110.9	90.7	29.4	20.2	15.6	11.9
Normal Infants	9754	9831	9909	9930	9945	9943

QALYs, quality-adjusted life years

Figure 1: Sensitivity Analysis Varying Probability of Bleeding Following PROM



395 Outcomes of elective induction of labor at 40 weeks versus expectant management at community hospitals

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OBJECTIVE: Recent evidence suggests that elective induction of labor may reduce cesarean deliveries and other obstetric outcomes. The current study compares elective induction of labor (eIOL) versus expectant management in nulliparous women at community hospitals.

STUDY DESIGN: This is a retrospective cohort study of singleton, vertex, nonanomalous deliveries in community hospitals in California between 2007 and 2011 using linked hospital discharge and vital statistics data (n=544,537). We compared eIOL defined by the Joint Commission at 40 weeks with expectant management. The primary outcomes of interest were cesarean delivery, neonatal death, operative vaginal delivery, shoulder dystocia, 5 minute Apgars less than 7, NICU admission, neonatal respiratory distress syndrome (NRDS), chorioamnionitis, and endomyometritis. Rates were first compared using chi-square analysis and then examined using multivariate logistic regression controlling for maternal age, comorbidities, ethnicity, education level, initiation of prenatal care in the first trimester, and insurance status.

RESULTS: Among women delivering at community hospitals, rates of cesarean delivery, neonatal death, operative vaginal delivery, and NICU admission were significantly lower among eIOL at 40 weeks than among women undergoing expectant management (Table 1). Rates of several adverse maternal and neonatal outcomes were also significantly lower among the eIOL group. Logistic regression analysis indicated expectant management past 40 weeks significantly increased the odds of cesarean delivery (OR 1.67, 95% CI 1.60-1.74) and neonatal death (OR 5.79, 95% CI 0.78-42.9) compared to eIOL.

CONCLUSION: Among women delivering at community hospitals, risk of cesarean delivery, neonatal death, and several adverse maternal and neonatal outcomes are significantly higher among women undergoing expectant management than among woman undergoing eIOL at 40 weeks.

Table 1: Rates of Outcomes Following Elective Induction of Labor at 40 Weeks or Expectant Management

	eIOL	EM	p value
Cesarean Delivery	24.55	34.59	<0.001
Neonatal Death	0.01	0.04	0.024
Operative Vaginal Delivery	6.92	7.55	0.003
Shoulder Dystocia	1.15	1.41	0.006
5 min Apgar <7	0.44	1.06	<0.001
NICU Admissions	5.31	7.11	<0.001
Neonatal Asphyxia	0	0.03	0.011
Neonatal seizures	0.04	0.12	0.003
NRDS	1.95	2.31	0.003
Scalp Injury	3.94	4.51	0.001
Chorioamnionitis	1.79	7.75	<0.001
Endomyometritis	0.71	1.39	<0.001

396 Medication adherence in women with gestational diabetes and its effect on pregnancy outcomes

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OBJECTIVE: Treatment of gestational diabetes (GDM) is associated with improved pregnancy outcomes. Obstacles to taking prescribed medications can lead to non-compliance. The objective was to determine the challenges that lead to low medication adherence and whether this increases the rate of adverse pregnancy outcomes in women with GDM.

STUDY DESIGN: A prospective, observational study was performed of women with GDM treated with metformin, glyburide or insulin at a tertiary care center. Women greater than 16 weeks gestation and treated for a minimum of 2 weeks were included. Women with pre-DM were excluded. Women completed a validated survey, MMAS-8 (low: score <6 and high: score 7-8), to identify women with low and high medication adherence. Information resulting in medication compliance was collected. The primary outcome was neonatal birth weight >4,000g. Secondary outcomes included factors with medication adherence, adherence rates for each medication and neonatal outcomes.

RESULTS: Of 79 women who met study criteria, 42 reported high and 37 reported low adherence. Birth weight >4,000g were similar in each group, (low: 16.2% vs. high: 7.1%, p = 0.292). Women prescribed metformin had the highest rate of high adherence (38.1%) and women on glyburide had the highest rate of low adherence (46%). The rate of neonatal hypoglycemia was significantly higher in women with low adherence compared to high adherence, (low: 70.3% vs high 42.9%, p = 0.023). There were similar rates of induction of labor, cesarean section, NICU admissions, and neonatal respiratory complications. There were no cases of shoulder dystocia, Erb's palsy, or major neonatal morbidities. Obstacles to medication adherence were documented in 14% of women including prescription error, insurance difficulties and delay in dispensing the medications. Adverse effects to medication were reported in 10-20% of women.

CONCLUSION: Although there were no differences in neonatal birthweight between groups, low medication adherence was associated with neonatal hypoglycemia. Challenges to compliance with prescribed medications occurred in 14% of GDM women and up to 1 in 5 women reported a medication side effects. Further studies are needed to investigate patient-specific and system-level strategies to improve medication adherence in women with GDM.

397 Neonatal risks associated with maternal glucose intolerance in the absence of gestational diabetes

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OBJECTIVE: To determine whether mild maternal glucose intolerance in the absence of diabetes is associated with neonatal complications, independent of maternal BMI.

STUDY DESIGN: This is a secondary analysis of the prospective cohort study, Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-Be (nuMoM2b). Women were included if they had any testing for glucose intolerance. Women were excluded if they had a diagnosis of gestational or pregestational diabetes or if they delivered preterm. The exposure of interest was maternal glucose intolerance, defined as any of the following: HbA1c ≥5.7%, elevated 1 hour glucose tolerance test (GTT) >135 and <200, fasting glucose ≥92, or any random glucose measurement ≥200. The primary outcome of interest was a composite of adverse neonatal outcomes including LGA birthweight >97%ile, hypoglycemia requiring treatment, and shoulder dystocia. Bivariate analyses compared women with glucose intolerance to women without glucose intolerance across demographic and clinical factors (Table 1). Odds ratios for the outcome of interest were compared between exposed and unexposed women using multivariable logistic regression to adjust for possible confounders (Table 2). Stratified analyses assessed the interaction of maternal BMI using the Mantel-Haenszel test and Taurone's test of homogeneity.

RESULTS: Of the 7,680 women included, 6624 (86.25%) had no glucose intolerance and 1056 (13.75%) met criteria for glucose intolerance. In bivariate analyses, women with glucose intolerance were older, less likely to be non-Hispanic black, and more likely to be overweight. Multivariable analyses revealed a significant increase in odds of LGA and shoulder dystocia among infants of women with glucose intolerance (OR 1.66, 95% CI 1.04-2.67 and OR 1.71, 95% CI 1.08-2.70, respectively). There was no difference between the groups in the primary composite neonatal outcome (OR 1.12, 95% CI 0.62-2.00). Stratified analyses demonstrated no difference in these associations by BMI category, indicating an independent relationship between glucose intolerance, LGA, and shoulder dystocia.

CONCLUSION: Maternal glucose intolerance without a diagnosis of diabetes may still predict clinically significant neonatal complications.