Retrospective Data Analysis for Pulmonary Hypertension in Pregnancy in a County Hospital System

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Introduction

Pulmonary hypertension (PH) during pregnancy has a reported maternal mortality of 26-51%[1,2] with incidence of major adverse cardiovascular event (MACE) reported as 24.8%.[3] Recommendations regarding management of PH during pregnancy, mode of delivery (MOD), and options for anesthesia lack standardization. The aim of this study was to analyze mode of delivery, anesthetic management trends and outcomes for obstetric patients with PH at our hospital. We hypothesized that mortality and risk of PH crises and heart failure are equivalent regardless of MOD.

Methods

After IRB approval, we retrospectively analyzed records from 2005 to 2021 in our county hospital system. Inclusion criteria were ICD 9 or 10 codes for pregnancy and PH. Data collected included type of PH, treatment during pregnancy, right heart function, MOD, type of anesthesia for cesarean, details of labor analgesia, gestational age at delivery and fetal outcomes at birth. The primary outcome analyzed was maternal and neonatal mortality in the immediate postpartum period. Secondary outcomes were PH crises and heart failure within 6 weeks postpartum.

Results

There were 13 patients with 14 discrete pregnancies within the study period. 12 neonates were delivered, and 2 pregnancies were electively terminated. The average age was 30.7 years with average BMI 34. Average gestational age at delivery was 35.5 weeks. Mild PH was present in 65% and severe PH in 35% of pregnancies. Right heart dysfunction was present in 29% of pregnancies. All 8 vaginal deliveries had epidural for analgesia, 3 cesareans had successful epidurals and one needed conversion to general for hemorrhage. There were 4 cesarean deliveries: 3 for obstetric indications, 1 for ease of care coordination. There were no mortalities within 6 weeks post-partum. No patients developed PH crisis or heart failure. 7 patients were lost to follow up, but no worsening of PH was noted in patients that had follow-up 6 weeks post-partum.

Number of pregnancies	**14**	
Number of patients	13	
Pregnancies (14)		
# of deliveries	**12**	**85.7%**
# of terminations	2	14.3%
Mortality		
Maternal	0	0.0%
Neonatal (at birth)	0	0.0%
RV function (14)		
Normal	10	71.4%
Depressed	4	28.6%
RV morphology (14)		
Normal	3	21.4%
Dilated	11	78.6%
WHO classification (14)		
Group 1	8	57.1%
Group 2	1	7.1%
Group 3	2	14.3%
Group 4	2	14.3%
Group 5	1	7.1%

PH severity (14)		
Mild	9	64.3%
Severe	5	35.7%
GA at delivery (12)		
< 37 weeks	6	50.0%
≥ 37 weeks	6	50.0%
Mode of delivery (12)		
Vaginal	8	66.7%
Cesarean	**4**	**33.3%**
Type of anesthesia (12)		
Neuraxial	11	91.7%
General	1	8.3%
Indication for cesarean (4)		
Prior cesarean	3	75.0%
Pulmonary hypertension	1	25.0%
Pre-eclampsia at delivery (12)		
Present	4	33.3%
Not present	8	66.7%

Discussion

The goal of this retrospective study was to identify trends and outcomes of pregnancies in obstetric patients with PH in a hospital system with Level IV Maternal Care. There were no maternal mortalities, PH crisis nor heart failure events within 6 weeks post-delivery or termination. This cohort demonstrates that vaginal delivery is safe in women with PH and the historical recommendation of delivery via cesarean solely for the indication of PH may no longer be necessary. Our study is limited by the small sample size of this rare disease. Larger registries of PH and pregnancy are necessary to provide recommendations regarding mode of delivery and optimal anesthetic and PH management of pregnant patients. Our study highlights that with the resources available at a Maternal Level IV care center, pregnant women with PH can be managed to successful and safe delivery.

References

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3. Thomas E, et al. J Am Heart Assoc 2017;6