

Maternal Complications and Pregnancy Outcome In Women With Pulmonary Hypertension: A Single Center Experience from South India.



DR. ANISH KEEPANASSERIL

DEPARTMENT OF OBSTETRICS & GYNECOLOGY

JAWAHARLAL INSTITUTE OF POSTGRADUATE MEDICAL EDUCATION & RESEARCH

PUDUCHERRY, INDIA





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- Conflict of Interest: None to declare

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 - Cardiologists Dr. Ajith Ananthakrishna Pillai
 Dr. Santhosh Satheesh

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 Dr. Yavana Suriya J,
 Dr. Aswini R.



Background

- Pregnancy when complicated with pulmonary hypertension carries poor prognosis
- Pregnancy is contraindicated in patients with pulmonary hypertension (WHO Class IV) as per current WHO & ESC guidelines.
- Maternal mortality reported : 17-56%
- Specific targeted therapy like PDES Inhibitors such as sildenafil and prostaglandin analogues: decreases mortality esp. in high income countries.
- Morbidity and mortality is still high in low to middle income countries in such patient where resources are limited and specialist services are segregated to few tertiary centers.



Objective

- To study the pregnancy outcome & maternal complication rates in women with pulmonary hypertension attending the tertiary center, catering the population of south-eastern region of India



Methods

- Study Design: Cohort Study
- Time period: January 2011 to December 2017.
- Study population: Pregnant women with pulmonary hypertension

➤ Inclusion Criteria:

- PH diagnosed during/prior to conception & defined as
 - Right ventricular systolic pressure (RVSP) > 40mmHg at rest, on echocardiography or
 - Pulmonary artery pressure (PAP) of >25mm Hg on right heart catheterization

➤ Exclusion criteria:

- Patients with PH secondary to left heart structural valvular disease



Methods

- Data collected: Age, parity, type of heart disease, etiology of PH, previous interventions, New York Heart Association (NYHA) functional class, medications.
- Gestational age at delivery, mode of delivery and any peri-partum complications
- Patients were categorized for analysis of outcomes
 1. Based on etiology into (i) idiopathic (i-PAH), (ii) 2^o to congenital heart disease (CHD-PAH) & (iii) others (O-PAH) 2^o to connective tissue disease, portal hypertension.
 2. Based on RVSP levels into (i) RVSP < 70 mm Hg and (ii) RVSP ≥ 70 mm Hg.



Methods

- Outcomes studied includes,
 1. Maternal mortality rates,
 2. Maternal medical complications (heart failure, rhythm disturbances)
 3. Obstetric complications such as pre-eclampsia, postpartum hemorrhage.
 4. Fetal/ Neonatal: Fetal growth Restriction (FGR) , prematurity, malformations, perinatal mortality



Methods

- Analysis was done using stat 13.1 (STATA Corp, USA)
 - Categorical data: frequencies and percentages
 - Continuous data: Mean with standard deviation or Median with 25th & 75th centiles
 - Differences between the groups: Student t test or one-way ANOVA or Kruskal Wallis test for the continuous variables and Fishers test or Chi-square test for categorical variable.
- A p value < 0.05 is considered significant.

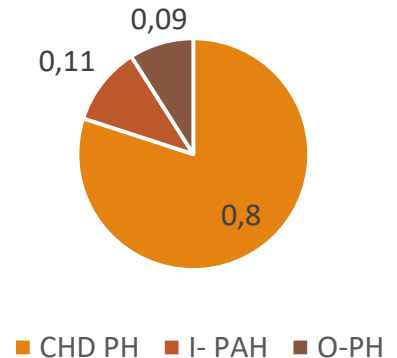


Results

- Total number of cases with pulmonary hypertension: 79
- Right heart catheterization done prior to conception to confirm PH: 26.5% (21/79)

➤ Causes

- PH secondary to Congenital Heart Disease : 63(79.7%)
- Idiopathic PH : 9(11.4%)
- PH due to other systemic diseases : 7(8.9%)





Results: Etiology of Pulmonary hypertension (Table1)

Causes	n (%) (Total=79)
1. PH related to Congenital Heart Disease	
Atrial Septal Defect	25 (31.7 %)
Ventricular Septal Defect	6 (7.6 %)
Patent ductus Arteriosus	2 (2.5%)
Eisenmenger Syndrome	9 (11.4 %)
Complex congenital Heart disease (uncorrected)*	13 (16.5%)
Complex congenital Heart disease (corrected)*	8 (10.1%)
2. Idiopathic Pulmonary Hypertension	9 (11.4%)
3. Porto-pulmonary Hypertension	5 (6.3%)
4. Others (Systemic causes)	2(2.5%)



Results : Baseline Characteristics (Table 2)

	Total Cases (n=79)	CHD-PAH (n=63)	I-PAH (n=9)	Other Causes (n=7)	p-value of diff. between 3 groups
Age, years	25.3 ± 4.1	25.2 ± 4.2	24.3 ± 3.0	27.6 ± 4.6	0.269
RVSP, mmHg	65.9 ± 24.0	97.3 ± 26.5	58.4 ± 22.1	58.4 ± 22.1	<0.001
Nulliparous	40(50.6%)	33(52.4%)	5(55.6%)	2(28.6%)	0.502
Timing of Diagnosis Before Pregnancy	43(54.4%)	37 (58.7%)	4(44.4%)	2(28.6%)	0.257
During Pregnancy	36 (45.6%)	26(41.3%)	5(55.6%)	5(71.4%)	
NYHA Class II/III at Conception	52 (65.8%)	37(53.2%)	8(55.6%)	7(100%)	<0.001
NHYA Class III/IV during pregnancy/ peri-partum	27 (34.5%)	16 (25.8%)	8 (88.9%)	3(42.9%)	0.084
Hemoglobin, gm/dl	10.4 ± 2.0	10.6 ± 2.0	9.3 ± 1.7	9.9 ± 2.0	0.139



Results: Management During Pregnancy & peri-partum period (Table 3)

	Total Cases (n=79)	CHD-PAH (n=63)	I-PAH (n=9)	Other Causes (n=7)	p-value of diff. between 3 groups
Medications					
Diuretics	49(62.0%)	36(57.1%)	9(100%)	4(57.1%)	0.045
Digoxin	20(25.3%)	9(14.3%)	9(100%)	2(28.6%)	<0.001
PDES-I	23(29.1%)	12(19.1%)	9(100%)	2(28.6%)	<0.001
Median Gestational age at delivery	37.5 (36.0-39.3)	38.0 (37.0 -39.4)	36.2 (35.1 -39.1)	36.0 (34.0 -37.2)	0.055
Mode of delivery					
Vaginal Delivery	37(48.0)	31 (50.8%)	2(22.2%)	4(57.1%)	0.101
Assis. Vag. Delivery	25(32.5%)	21 (34.4%)	4(44.5%)	0	
Cesarean section	15 (19.5%)	9(14.8%)	3(33.3%)	3(42.9%)	
General Anesthesia during cesarean section	11 (66.7%)	5(55.6%)	3(100.0%)	3(100.0%)	0.148
Antithrombotic therapy	21(26.6%)	15 (23.8%)	5 (55.6%)	1(14.3%)	0.097

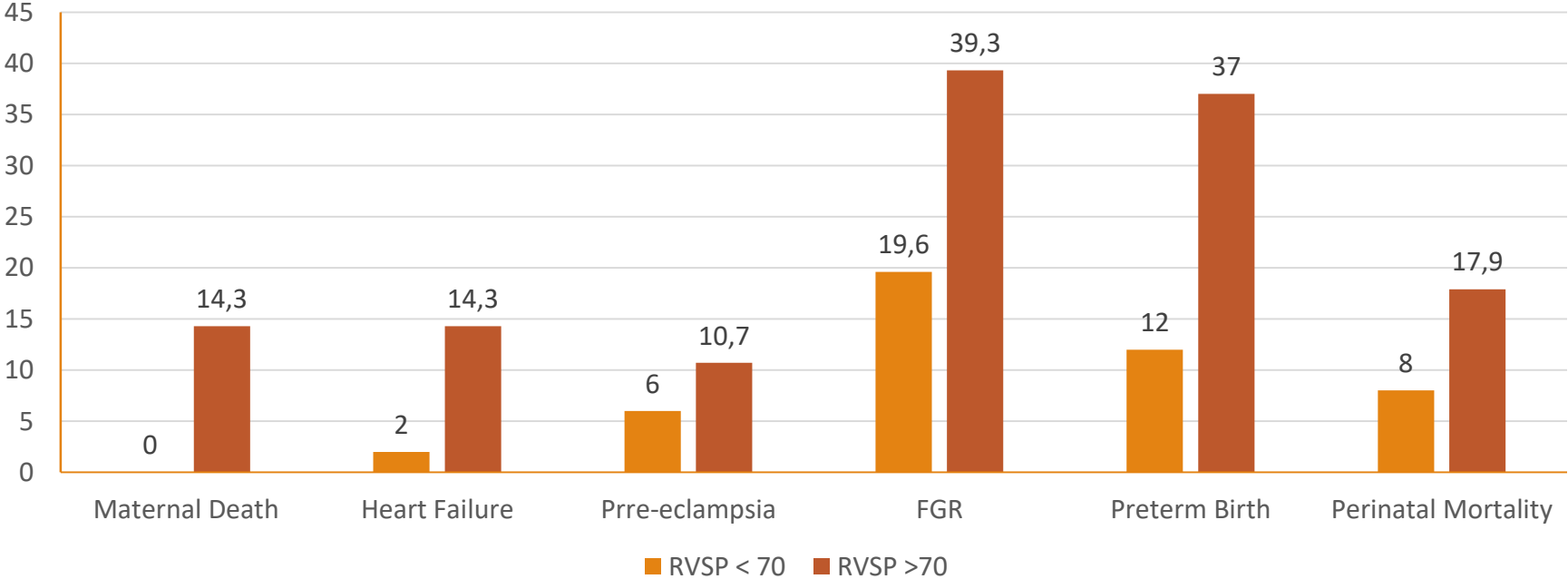


Results: Maternal & neonatal Outcome based on Aetiology (Table 4)

	Total Cases (n=79)	CHD-PAH (n=63)	I-PAH (n=9)	Other Causes (n=7)	p-value of diff. between 3 groups
Maternal Outcome					
Maternal Death	4(5.1%)	2(3.2%)	2 (22.2%)	0(0)	0.303
Complications					
Heart Failure	5(6.3%)	2(3.2%)	1(11.11%)	2(28.6%)	0.027
Pre-eclampsia	6(7.6%)	4 (6.5%)	1(11.1%)	1(14.3%)	0.701
FGR	21(26.6%)	18(28.6%)	1(11.11%)	2(28.6%)	0.536
Neonatal Outcome					
Birth weight, (grams)	2372.5 ± 663.2	2401.8 ± 682.6	2393.3 ± 480.7	2090.7 ± 708.3	0.541
Low Birth Weight	21(27.3%)	16(26.2%)	2(22.2%)	3(42.9%)	0.605
Preterm Delivery	16 (20.8%)	11(18.0%)	3(33.3%)	2(28.6%)	0.497
Perinatal Death	9(11.1%)	8(12.9%)	0 (0)	1(14.3%)	0.512



Results: Maternal & Neonatal Outcome based on RVSP levels (fig 2)





Conclusion

- Women with I-PAH has a higher risk of maternal and fetal mortality, so pre-pregnancy counselling and early booking in pregnancy should be encouraged
- Early referral to a tertiary center and a multidisciplinary team approach can optimize the outcome even in resource constrained settings

The image shows the exterior of a modern, multi-story hospital building with a light-colored facade and dark window frames. A prominent sign in the foreground reads "JIPMER WOMEN & CHILDREN'S HOSPITAL". The building features a central entrance with a covered area supported by columns. The foreground is a green lawn with some trees and a fence line. The sky is blue with some clouds.

JIPMER WOMEN & CHILDREN'S HOSPITAL

Thank You