

Maternal Mortality in the Post-delivery Period in Patients with Pulmonary Hypertension

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Background

Pregnancy in women with pulmonary hypertension (PH) is considered to be associated with high maternal mortality.

More than two thirds of deaths occurred within the first month after delivery with limited follow-up period (usually 6 months).

New advanced therapies for the treatment of PH improved prognosis for pregnant women.

(Weiss, Zemp, Seifert, & Hess, 1998, Bedard, Dimopoulos, & Gatzoulis, 2009, Sliwa et al., 2016).

Methods - Data source

To study the maternal mortality in the post-delivery period in patients with pulmonary hypertension, we used a database of

Hospital discharge records in New York state

- from Statewide Planning and Research Cooperative System (SPARCS)
- between 2008-2014

Linked to New York State death certificate

- between 2008-2014

Study cohort: PH patients with hospital records of labor and delivery.

Results - Demographics

	Pulmonary Hypertension	
	Without Mortality	With Mortality
N	636	20
Age	32(6.2)	30.5(6.8)
Race		
Non-Hispanic white	199(31.4)	3(15)
Black	250(39.5)	13(65)
Asian	21(3.3)	-
Hispanic	97(15.3)	2(10)
Native American	61(9.6)	2(10)
PH type		
CM/VHD	220(34.8)	9(45)
Isolated	350(55.3)	7(35)
Congenital	171(9.8)	4(20)
Comorbidities		
Pre-eclampsia/eclampsia	171(27)	6(30)
DM	54(8.5)	3(15)
GDM	71(11.2)	3(15)

Among 1,098,694 patients with records of delivery, 656 PH patients were identified.

A relatively large cohort of PH patients with labor and delivery records

Racially diversified population

Results – Mortality data

Table 2. Demographics

	Pulmonary Hypertension	
	Without Mortality	With Mortality
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20 deaths were found after delivery.

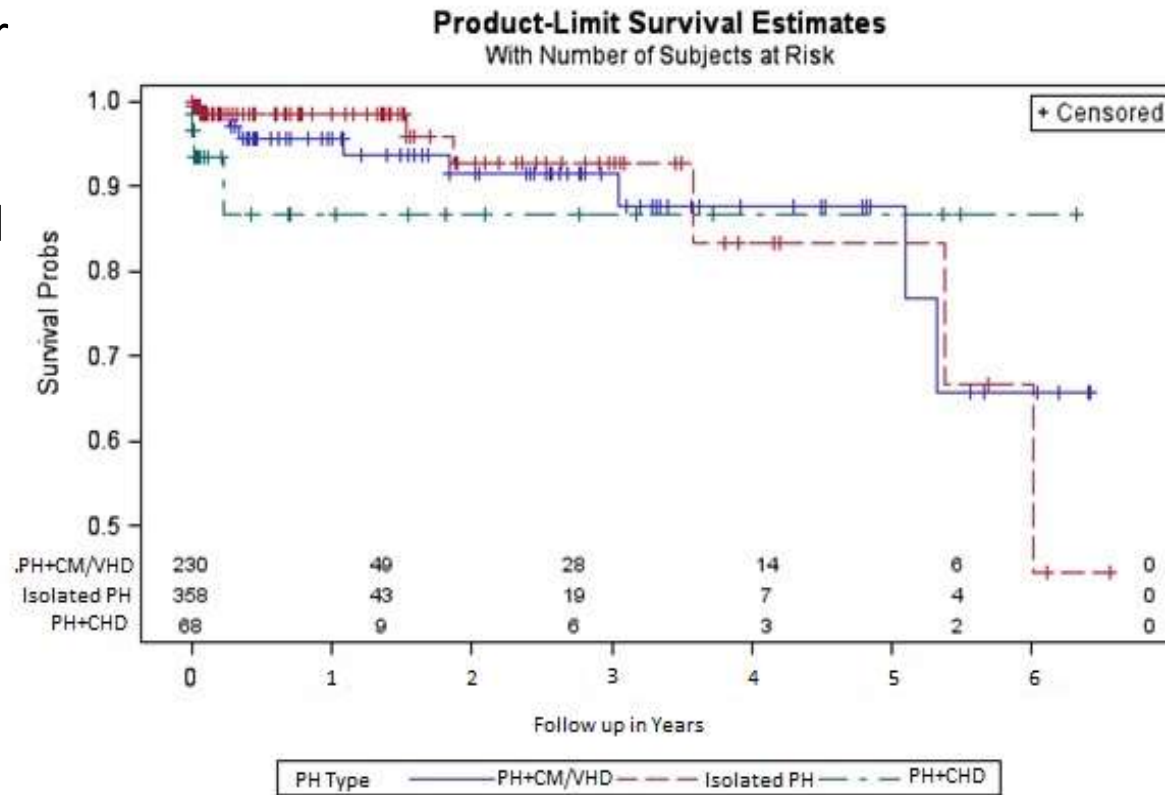
The average age at death was 31.7 ± 7.5 years.

7 patients had mortality within 1 month of delivery, 10 within 6 months of delivery, and 10 deaths beyond 1 year.

Kaplan Meier Curve for Maternal Mortality in Subtypes of PH

PH with CHD showed higher mortality within the first 6 months of delivery, while PH with CM or VHD showed higher mortality and isolated PH had highest mortality in the long term.

PH+CM/VHD
 Isolated PH
 PH+CHD



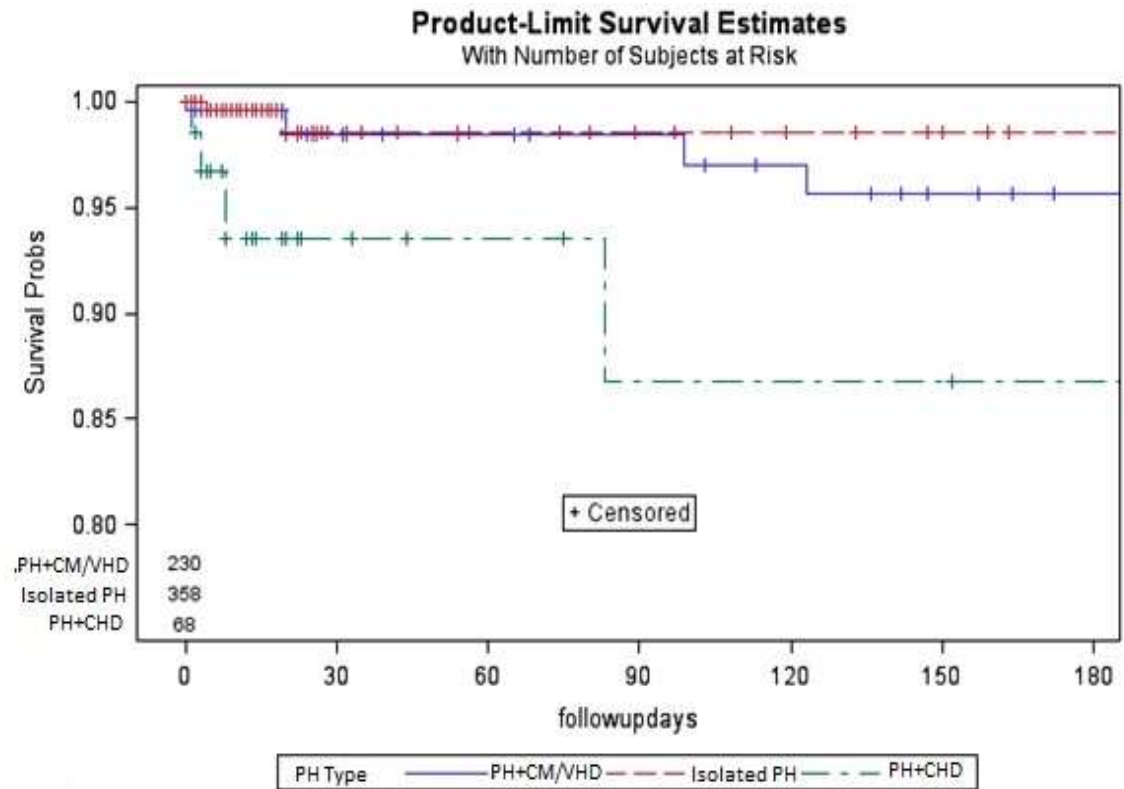
Kaplan Meier Curve for Maternal Mortality in Subtypes of PH within 6 months of delivery

PH with CHD showed higher mortality within the first 6 months of delivery, while PH with CM or VHD showed higher mortality and isolated PH had highest mortality in the long term.

PH+CM/VHD

Isolated PH

PH+CHD



Conclusion

Mortality within 6 months of delivery in patients with pulmonary hypertension was not negligible and indicates close follow-up for a prolonged period is needed for the high-risk patient population.

Subtypes of PH could be associated with different mortality patterns post delivery.

Limitations

This database study's validity relies on the accuracy of discharge records and death certificates, and results need to be verified with clinical observation and long term follow-up.

COMPARED to ROPAC

151 women with PH either diagnosed by right heart catheterization or diagnosed as possible PH by echocardiographic signs.

Maternal death up to 1 week after delivery occurred in five patients (3.3%), with another two out of 78 patients who presented for follow-up (2.6%), dying within 6 months after delivery. The highest mortality was found in iPAH (3/7, 43%).

sample size

cohort selection (clinical study vs. database study with diagnosis codes)

usually in tertiary center vs. population based study

follow-up period of up to 6 months with loss rate of 50% vs. follow-up period of 6 years

Supplements

Table 1. ICD9 Codes List

Disease	ICD-9-CM codes
PH	415.0, 416.0, 416.8, 416.9
CHD	745.0-745.9, 746.00-746.9, 747.0-747.9 (excluding 747.5, 747.6, 747.8), V1365
CM	674.50-674.54, 425.1-425.18, 425.0 and 425.2-425.9
VHD	394.0-394.9, 395.0-395.9, 396.0-396.9, 397.0-397.9, 424.0-424.99, V42.2, V43.3

PH-Pulmonary Hypertension

CHD-Congenital Heart Disease

CM-Cardiomyopathy

VHD-Valvular heart disease