FLORIDA DEPARTMENT OF HEALTH

PAMR

Pregnancy-Associated Mortality Review

Florida Department of Health, Division of Family Health Services

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Pregnancy-Related Deaths during the Postpartum Period, 1999-2008

In 1996, the Florida Department of Health initiated the Pregnancy-Associated Mortality Review (PAMR) to improve women's health through investigating and monitoring pregnancy-related mortality. A pregnancy-related death is a death resulting from: 1) complications of the pregnancy itself; 2) the chain of events initiated by the pregnancy that led to death; or 3) aggravation of an unrelated condition by the physiologic or pharmacologic effects of the pregnancy that subsequently caused death.[1]

In Florida, the Pregnancy-Associated Mortality Review (PAMR) pregnancy-related mortality ratio has fluctuated from 20.3 deaths per 100,000 live births in 1999 to 14.3 in 2008. The Healthy People 2010 goal is to reduce maternal mortality to 3.3 maternal deaths per 100,000 live births. During 1999-2008, the PAMR team classified 368 cases as pregnancy-related deaths. The majority of the deaths 280 (76%) occurred during the postpartum period. Figure 1 shows the time distribution for these 368 deaths.

Many complications can occur within 1 year following a pregnancy. The early postpartum period is critical to maternal survival. The American Academy of Pediatrics, American College of Obstetricians and Gynecologists, and the American College of Nurse Midwives recommend that every postpartum woman should have a follow-up visit within 4 to 6 weeks after delivery or within 7 to 14 days after a cesarean delivery or complicated delivery.[2]

During this postpartum period, 237 (85%) deaths occurred early in the postpartum period (0-42 days), and 43 (15%) occurred later (43-365 days), see Figure 2. Most deaths occurred early in the postpartum period, prior to the recommended 4 to 6 week postpartum check-up. Sixty-two percent of the deaths occurred within 2 weeks of their live birth or fetal demise.

Of the 174 (62%) women dying during the first 2 weeks of their live birth or fetal demise, 26% were discharged and 74% were not discharged from the hospital prior to death. One was a planned home birth by a family member (not included in Table 1). The leading causes of death were Hypertension and Embolism for those not discharged and Cardiomyopathy and Infection for those discharged from the hospital, see Table 1.

Table 2 shows women who received no prenatal care had 6 times the risk of dying during the postpartum period than women who received prenatal care during the first trimester. Black non-Hispanic

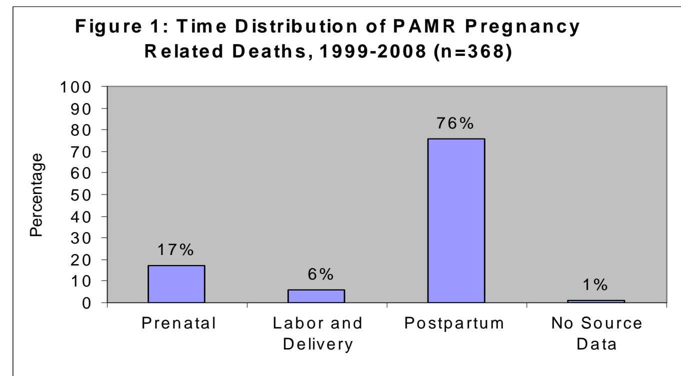

Figure 1: Time Distribution of PAMR Pregnancy Related Deaths, 1999-2008 (n=368)

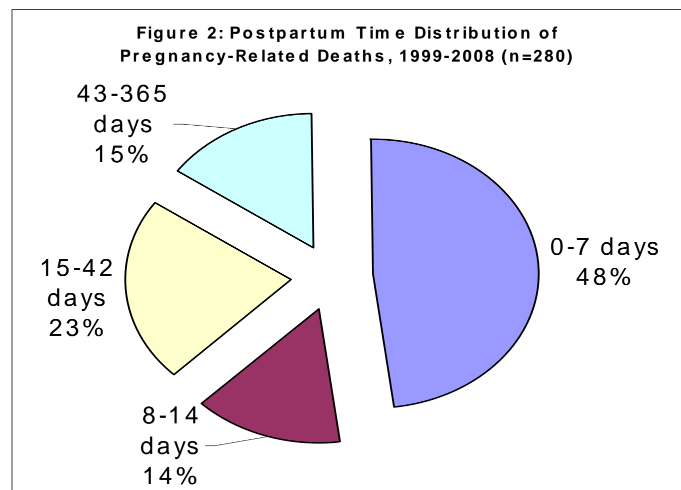

Figure 2: Postpartum Time Distribution of Pregnancy-Related Deaths, 1999-2008 (n=280)

Table 1: Pregnancy-Related Postpartum Causes of Death within Two-Weeks of the Live Birth or Fetal Death, 1999-2008 (n=174)

	Not Discharge		Discharge	
Cause of Death	Number	Percent	Number	Percent
Hypertensive Disorder	32	24.81%	6	13.64%
Embolism	31	24.03%	5	11.36%
Hemorrhage	23	17.83%	0	0.00%
Infection	7	5.43%	9	20.45%
Cardiomyopathy	1	0.78%	11	25.00%
Other CVS	5	3.88%	7	15.91%
Anesthesia	2	1.55%	0	0.00%
Other	19	14.73%	5	11.36%
Unknown	9	6.98%	1	2.27%
Total	129	100.00%	44	100.00%

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women had a 3 times greater probability of experiencing a postpartum pregnancy-related death than White non-Hispanic or Hispanic women.

In summary, women at high risk of postpartum pregnancy-related death were:

- Overweight or Obese
- Black non-Hispanic
- Older than 35 or younger than 20 years of age
- Lacking prenatal care
- Less educated

Table2: Postpartum Pregnancy-Related Mortality Ratios and Unadjusted Relative Ratios, 1999-2008

	Total Deaths	Pregnancy-Related Mortality Ratios	Relative Ratios	Lower CI	Upper CI	Births
Race and Ethnicity						
White non-Hispanic /Ref	90	8.61	Ref.	-	-	1,045,409
Black non-Hispanic*	135	28.67	3.33	2.55	4.35	470,892
Hispanic	47	8.21	0.95	0.95	1.36	572,228
Age groups						
19 or less*	34	13.75	1.67	1.07	2.61	247319.00
20-24/Ref	46	8.21	Ref.	-	-	560,089
25-34	115	10.87	1.32	0.94	1.86	1,057,494
35 or greater*	85	27.29	3.32	2.32	4.76	311,429
Education						
< High School	22	4.93	0.74	0.46	1.20	446,646
High School*	104	14.75	2.22	1.63	3.02	705,318
> High School/Ref	67	6.64	Ref.	-	-	1,009,278
Marital Status						
Married/Ref	150	11.85	Ref.	-	-	1,266,343
Unmarried	130	14.30	1.21	0.95	1.53	908,871
Prenatal Care Initiation						
1st Trimester/Ref	92	5.53	Ref.	-	-	1,662,957
2nd Trimester	24	8.06	1.46	0.93	2.28	297,584
3rd Trimester	4	6.69	1.21	0.44	3.29	59,791
None*	10	34.44	6.22	3.24	11.95	29,040
Body Mass Index (BMI) Categories						
Underweight	11	10.40	1.69	0.89	3.21	105,724
Healthy Weight/Ref	63	6.14	Ref.	-	-	1,025,946
Overweight	64	13.26	2.16	1.53	3.06	482,551
Obese I	49	21.29	3.47	2.39	5.04	230,192
Obese II	22	22.37	3.64	2.24	5.92	98,331
Obese III	31	50.02	8.15	5.3	12.52	61,977

*Statistically Significant

Florida PAMR Committee Postpartum Recommendations:

Self-Empowerment - systems must be in place to assure the health needs of postpartum women are being met. Women and their families must know how to recognize the “danger signs,” where to access healthcare, and what services are available.

Discharge Teaching - must be thorough, specific, and education-level appropriate. Teaching should include information on the importance of seeking care for prolonged headache, shortness of breath, swelling, abdominal redness, warmth, pain in lower extremities, chest pain, palpitations, and syncope. Teaching should also stress the importance of follow-up and, in addition, women with complex medical problems during delivery need to be carefully evaluated prior to discharge and may need longer hospital stays.

Providers - need more training and education on linking high-need patients to local resource support systems such as WIC and Healthy Start. Increase the awareness of obese patients being at high risk for thrombophlebitis and the need for prophylaxis postpartum. Medical providers need to fully evaluate postpartum hypertension prior to discharge and healthcare staff should be taught about the importance of proper blood pressure techniques.

Emergency Personnel Training - increase the awareness of potential cardio-respiratory complications in all postpartum women presenting to the emergency facility; these women need to have comprehensive evaluations and linkage to primary OB. Emergency personnel should be aware of signs and symptoms of eclampsia postpartum.

Education and Counseling - should be provided to all women concerning chronic illness, nutrition, exercise, lifestyle habits, baby spacing, and family planning.

Continued, ongoing monitoring of systems of care as well as further research of cultural, health issues, and prevention programs are warranted.

References:

1. Berg C, Danel I, Atrash H, Zane S, Barlett L. Strategies to reduce pregnancy-related deaths: from identification and review to action. Atlanta: Centers for Disease Control and Prevention; 2001.
2. Guidelines for Perinatal Care, Sixth Edition, 2007. American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, page 172.

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