Trends of Perinatal Deaths at Ramathibodi Hospital: 1995-2005

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Objective: *To study the trends in perinatal mortality rate and causes of perinatal deaths at Ramathibodi Hospital from 1995 to 2005*
Design: *Retrospective descriptive study*
Material and Method: *Review of medical records and reports during academic activities*
Results: *The perinatal mortality rate was 5.10 per 1,000 births. Stillbirth and early neonatal death rate were 3.45 and 1.65 per 1,000 births, respectively. The most common cause of death was macerated fetus (46.80%). Causes of death from congenital anomalies, immaturity, asphyxia and specific conditions were 20.89%, 9.47%, 8.08% and 14.76%, respectively.*
Conclusion: *The perinatal mortality rate at Ramathibodi Hospital has declined from 6.70 in 1985 to 5.10 per 1,000 births and remained steady for the last 11 years. Future progress in reducing perinatal deaths requires better understanding of the etiology of stillbirth to improve the strategies for prevention.*

Keywords: *Perinatal mortality rate, Cause of death*

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Perinatal mortality has long been used as an indicator of prenatal and neonatal health care. The perinatal mortality has declined over time in many developed country indicating better strategies for preventing complication and improved medical care[1,2]. The research for the underlying causes of perinatal death is necessary for further reduction of the perinatal death.

The purpose of this study was to examine the trend in perinatal mortality rate, cause of perinatal death and weight specific mortality rate over an eleven-year period from 1995-2005 at Ramathibodi Hospital.

Material and Method

Data sources

Perinatal deaths were identified from the medical records of patients delivered at Ramathibodi Hospital from January 1, 1995 to December 31, 2005. Medical records and report collected during academic activities, which were held at a monthly interval, were used to generate the data for analysis. SPSS version 11.5 was used for data analysis.

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Definitions

Perinatal mortality is defined as a total of all stillbirths occurring at or over 22 completed weeks of gestation or fetus weighing at least 500 grams and neonatal deaths occurring within the first 7 days of life[3].

The perinatal mortality rate is defined as the number of perinatal deaths expressed as a proportion of 1,000 total births occurring in the same area at the same time[3].

In this study, cause of perinatal death is categorized according to Wigglesworth classification including macerated fetus, congenital anomalies, immaturity, asphyxia and specific conditions[4].

Results

There were 243 stillbirths, 116 early neonatal deaths and 70,371 births in eleven years. Stillbirth and

early neonatal death rate were 3.45 and 1.65 per 1,000 births, respectively. The perinatal mortality rate was 5.10 per 1,000 births (Table 1). The perinatal mortality rate showed a steady trend at 5.16 per 1,000 births in 1995 and 6.11 per 1,000 births in 2005, the rate dropped to around 4 per 1,000 births in1999 to 2002. The most common cause of death according to Wigglesworth classification was macerated fetus (46.80%) which had no definite pathological diagnosis due to severe autolysis of the fetus. Causes of death from congenital anomalies, immaturity, asphyxia and specific conditions were 20.89%, 9.47%, 8.08% and 14.76%, respectively (Table 2). Causes of perinatal death from immaturity and asphyxia remained low, less than 1 per 1,000 births, throughout eleven years. Congenital anomalies became an important cause of death after 2002.

The risk of perinatal death was strongly associated with birth weight; rate decreased at higher birth weight. The perinatal mortality rates were 264.32 per 1,000 births in fetus weighing less than 1,000 grams, 173.30 per 1,000 births in fetus weighing 1,001-1,500 grams and decreased to 0.57 per 1,000 births in fetus weighing more than 4,000 grams. However, in the group of fetuses weighing more than 2,500 grams, the rate was very low, less than 2 per 1,000 births (Table 3). Macerated fetus was the most common cause of death in all birth weight categories. Cause of death from immaturity was not seen in fetus weighing more than 2,500 grams. Asphyxia was a significant cause of death in fetus weighing 3,500-4,000 grams (Table 4).

Table 1. Perinatal mortality rate (PMR) at Ramathibodi Hospital: 1995-2005

Year	Total births	Stillbirth	Neonatal death	Perinatal death	PMR
1995	7,758	33	7	40	5.16
1996	7,608	22	12	34	4.47
1997	7,718	35	14	49	6.35
1998	7,085	23	14	37	5.22
1999	6,684	19	8	27	4.04
2000	7,045	16	18	34	4.83
2001	6,017	16	6	22	3.66
2002	5,496	17	3	20	3.64
2003	5,286	24	15	39	7.38
2004	5,088	23	6	29	5.70
2005	4,586	15	13	28	6.11
Total	70,371	243	116	359	5.10

Table 2. Causes of perinatal death at Ramathibodi Hospital: 1995-2005

Causes of death (per 1,000 births)	Macerated fetus	Congenital anomalies	Immaturity	Asphyxia	Specific conditions
1995	3.09	0.77	0.26	0.39	0.64
1996	2.37	0.66	0.39	0.39	0.66
1997	2.85	1.30	0.52	0.91	0.78
1998	2.54	0.99	0.56	0.56	0.56
1999	2.24	0.15	0.60	0.30	0.75
2000	1.70	1.14	0.85	0.43	0.71
2001	1.99	0.83	0.66	0.17	0
2002	2.18	0.73	0.18	0.36	0.18
2003	2.65	2.27	0.19	0.38	1.89
2004	2.16	1.57	0.20	0	1.77
2005	2.18	1.96	0.87	0.44	0.65
Total (%)	2.39 (46.8)	1.07 (20.89)	0.48 (9.47)	0.41 (8.08)	0.75 (14.76)

Table 3. Weight specific mortality rate at Ramathibodi Hospital: 1995-2005

Birth weight	Perinatal deaths	PMR (per 1,000 births)
500-1,000 g (n = 227)	60	264.32
1,001-1,500 g (n = 427)	74	173.30
1,501-2,000 g (n = 1,087)	71	65.32
2,001-2,500 g (n = 4,413)	57	12.92
2,501-3,000 g (n = 22,068)	40	1.81
3,001-3,500 g (n = 29,704)	38	1.28
3,501-4,000 g (n = 10,695)	18	1.68
> 4,000 g (n = 1,750)	1	0.57
Total (n = 70,371)	359	5.10

Table 4. Weight specific causes of death at Ramathibodi Hospital: 1995-2005

Birth weight (grams)	Macerated fetus n (%)	Congenital anomalies n (%)	Immaturity n (%)	Asphyxia n (%)	Specific conditions n (%)
500-1,000	22 (36.7)	9 (15)	18 (30)	3 (5)	8 (13.3)
1,001 -1,500	34 (45.9)	19 (25.7)	10 (13.5)	3 (4.1)	8 (10.8)
1,501-2,000	40 (56.3)	14 (19.7)	4 (5.6)	6 (8.5)	7 (9.9)
2,001-2,500	26 (45.6)	14 (24.6)	2 (3.5)	4 (7)	11 (19.3)
2,501-3,000	19 (47.5)	12 (30)	0 (0)	2 (5)	7 (17.5)
3,001-3,500	19 (50)	5 (13.2)	0 (0)	6 (15.8)	8 (21.1)
3,501-4,000	7 (38.9)	2 (11.1)	0 (0)	5 (27.8)	4 (22.2)
> 4,000	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)
Total	46.8	20.9	9.5	8.1	14.8

Discussion

The determination of perinatal mortality rate and classification of the cause of perinatal death is very important in evaluating the quality of health services of an institution in comparison with others. However, the variability in the definition of the perinatal period makes it difficult to compare the result from different countries. Some countries include infants born after 20th, 22nd, and 24th weeks of gestation in the perinatal period[5,6], while some countries include only infants born after 28th weeks of gestation[7]. According to the International Statistical Classification of Diseases and Related Health Problems, 10th edition (ICD-10), WHO provides the definition of perinatal period as 22 completed weeks (154 days) of gestation (the time when birth weight is normally 500 grams), and ends at seven completed days after birth[3], which was the inclusion criteria of this study. The perinatal mortality rate at Ramathibodi Hospital was 5.10 per 1,000 births, which was lower than the 10 per 1,000 births of the whole country[8].

The number of total births significantly declined since the government "30 baht project" was launched in the year 2001. This project allowed the patients to pay only 30 baht per visit or admission only if they had antenatal care or delivered in the hospital in their hometown. Ramathibodi Hospital is a medical school and usually gets high-risk pregnancy referrals that cause an increase in perinatal mortality rate since 2003.

Stillbirth was the major cause of perinatal deaths and the most common cause of death is macerated fetus. Risk factors of stillbirth such as obesity, socioeconomic factor, advanced maternal age, smoking, and inadequate antenatal care[9,10] should be identified. Strategies to reduce stillbirth should focus on reduction or elimination of risk factors (e.g. control of smoking and medical conditions), better antepartum

monitoring of those with risk factors followed by early delivery for the fetus found to be at risk (i.e. intrauterine growth restriction, maternal pre-eclampsia)[11-12]. Maternal fetal movement counting can also reduce fetal mortality[13]. Congenital anomaly was the second most common cause of death in this study: 20.89%. Congenital anomaly has increased over the last 3 years and caused an increase in overall perinatal mortality. Lethal congenital anomalies can be reduced by early antenatal care, improvement of prenatal diagnosis and appropriate counseling followed by termination prior to the time that the fetal death is classified as stillbirth[12].

Although immaturity contributed to a minor portion of perinatal death, the risk of perinatal death increased markedly with decreasing birth weight. Risk factors of preterm birth were identified in many studies to initiate risk specific treatment. The potent factors of preterm birth were positive cervical-vaginal fetal fibronectin and cervical length less than 10th percentile[14,15]. However, prevention of preterm birth still need further study. Prenatal administration of progesterone has been shown to reduce the risk of preterm birth in meta-analysis[16].

Compare to a previous study[17], the perinatal mortality rate at Ramathibodi Hospital has declined from 6.7 in 1985 to 5.1 per 1,000 births and has remained steady in the last 11 years. It is difficult to reduce further the perinatal death due to its low rate. Therefore, the main strategy should focus on the reduction of stillbirth and better antepartum surveillance.

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แนวโน้มการตายปริกำเนิดที่โรงพยาบาลรามาธิบดี: 2538-2548

ปัทมา พรหมสนธิ, ประทักษ์ โอประเสริฐสวัสดิ์

วัตถุประสงค์: *เพื่อศึกษาแนวโน้มอัตราการตายปริกำเนิดและสาเหตุของการตายปริกำเนิดที่โรงพยาบาลรามาธิบดี ตั้งแต่ปี พ.ศ. 2538-2548*

รูปแบบการวิจัย: *การศึกษาเชิงพรรณนาแบบย้อนหลัง*

วัสดุและวิธีการ: *ทบทวนเวชระเบียนผู้ป่วยที่คลอดที่โรงพยาบาลรามาธิบดีตั้งแต่ 1 มกราคม พ.ศ. 2538 ถึง 31 ธันวาคม พ.ศ. 2548*

ผลการศึกษา: *อัตราตายปริกำเนิดเท่ากับ 5.10 ต่อ 1,000 การคลอด โดยเป็นอัตราการตายคลอด 3.45 ต่อ 1,000 การคลอด และเป็นอัตราการตายของทารกใน 7 วันแรก 1.65 ต่อ 1,000 การคลอด สาเหตุการตายปริกำเนิดที่พบมากที่สุด คือ การตายเปื่อยยุ่ยร้อยละ 46.80 สาเหตุการตายปริกำเนิดจากความพิการแต่กำเนิด การคลอดก่อนกำหนด ภาวะขาดออกซิเจน และสาเหตุเฉพาะพบร้อยละ 20.89, 9.47, 8.08 และ 14.76 ตามลำดับ*

สรุป: *อัตราตายปริกำเนิดของโรงพยาบาลรามาธิบดี ลดลงจาก 6.7 ต่อ 1,000 การคลอดในปีพ.ศ. 2528 เป็น 5.1 ต่อ 1,000 การคลอด และมีแนวโน้มคงที่ใน 11 ปีหลัง แนวทางการลดอัตราตายปริกำเนิดควรมุ่งเน้นการหาสาเหตุของการตายคลอดเพื่อหาแนวทางการป้องกันต่อไป*