
OBSTETRICS

Preterm Birth at Siriraj Hospital : A Seven-Year Review (2002-2008)

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ABSTRACT

Objective: To determine the preterm birth rate, neonatal body weight and causes of total early neonatal death at Siriraj Hospital for 7-year period (2002-2008).

Materials and Methods: The medical records of preterm birth and neonatal body weight at Siriraj Hospital during 2002-2008 were collected and analyzed.

Results: During 7-year period, 2002-2008, the total birth rate was decreased steadily from 2002-2006, but was increased suddenly in 2007 then decreased slightly in 2008. The rate of preterm birth was increased steadily from 2004 to 2008 (9.44%-12.98%). The rate of threatened preterm labor was constantly between 1.20 -1.78%. Among preterm birth, low birth weight infant was mostly found except in the year 2003. Early neonatal death was mostly caused from fetal abnormality while sepsis and chromosome abnormality were the lowest causes of fetal death. Trend of neonatal death from prematurity had continuously decline and no early neonatal death in year 2008.

Conclusion: Regarding to 7-year review, the preterm birth rate was consistent during 7 years while premature baby was almost survived. Prematurity was not the common cause of early neonatal death.

Keywords: preterm birth rate, Siriraj Hospital

Introduction

Birth before 24-26 weeks of gestation is highly associated with perinatal mortality therefore some centers define birth before this period as abortion. Preterm baby with lowest gestational age and birth weight are associated with highest risk of fetal death.^(1,2)

Preterm birth was the major cause of perinatal mortality and morbidity. In the United States of America, during 2005 and 2006, about 12.8% of all live births

were <37 weeks of gestation and 2% of them were <32 weeks which were higher than the previous year.^(3,4) This evidence was demonstrated by the improved survival rate for very low birth weight infants.^(5,6) The highest survival rates for very low birth weight infants were in hospitals that had the highest level of neonatal intensive care which provides mechanical ventilation and well-trained neonatologists.⁽⁷⁾

Trend of preterm delivery in Siriraj Hospital has been changed for 7 years. The situation of social policy,

hospital contract and financial problems were the main issues for the decision of the patient of the place of delivery. Preterm birth has been increased steadily in many centers which resulted from the technique of assisted reproduction, high prevalence of complicated pregnancy and other.^(3,4,8) Siriraj Hospital is the super-tertiary center where the complicated cases were referred for an intensive care, therefore preterm birth rate was high. Aim of our study was designed to analyze the trend of preterm birth, threatened preterm labor, neonatal body weight and causes of early neonatal death as the preliminary results for the future improvement and proper management of newborn care.

Definition

Threatened preterm labor was defined as regular uterine contractions occurring at the frequency of at least 1 time in 10 minutes with no effacement or dilatation of cervix between 20-37 weeks. The examination was taken at least 30 minutes.⁽⁹⁾

Preterm labor was defined as regular uterine contractions 4 times in 20 minutes or 8 times in 60 minutes with progressive cervical dilatation greater than 1 cm and effacement at least 80%.⁽¹⁰⁾

Preterm birth was defined as a delivery that happened before 37 completed weeks (less than 259 days) of gestation.⁽¹¹⁾

Materials and Methods

The medical records of preterm birth, neonatal body weight, causes of early neonatal death in Siriraj Hospital during 2002-2008 were reviewed and analyzed. SPSS version 13 was used to analyze the data.

Results

During 7-year period, 2002-2008, the birth was decreased steadily from 2002-2006, but was increased suddenly in 2007 then decreased slightly in 2008 (Table 1, Fig. 1). When preterm birth and threatened preterm labor were calculated in percentage, the rate of preterm birth was increased steadily from the year 2004 to 2008 (Table 1, Fig. 2) while threatened preterm labor rate was constantly between 1.20 -1.78% (Table 2, Fig. 3). Among preterm birth, low birth weight infant was mostly found except in the year 2003 (Table 3). Early neonatal death was mostly caused from fetal abnormality while sepsis and chromosome abnormality were the lowest causes of fetal death during 7 years (Table 4). Trend of neonatal death from prematurity has continuously declined and has no early neonatal death in year 2008 (Table 4, Fig. 4). Cost of newborn care for complicated preterm birth in Siriraj Hospital, Bangkok and Thailand from Coratat T (Table 5) is also cited in this paper.⁽¹²⁾

Table 1. Total birth and preterm birth during year 2002-2008.

| Year | Total birth | Preterm birth (%) |
|------|-------------|-------------------|
| 2002 | 10,034 | 1,098 (10.94%) |
| 2003 | 9,816 | 1,193 (12.15%) |
| 2004 | 9,104 | 859 (9.44%) |
| 2005 | 8,712 | 919 (10.55%) |
| 2006 | 7,078 | 738 (10.43%) |
| 2007 | 9,080 | 1,001 (11.02%) |
| 2008 | 8,920 | 1,158 (12.98%) |

Table 2. Total threatened preterm labor during year 2002-2008.

| Year | Threatened preterm labor (%) |
|------|------------------------------|
| 2002 | 156 (1.55%) |
| 2003 | 118 (1.20%) |
| 2004 | 135 (1.48%) |
| 2005 | 139 (1.60%) |
| 2006 | 126 (1.78%) |
| 2007 | 142 (1.56%) |
| 2008 | 128 (1.43%) |

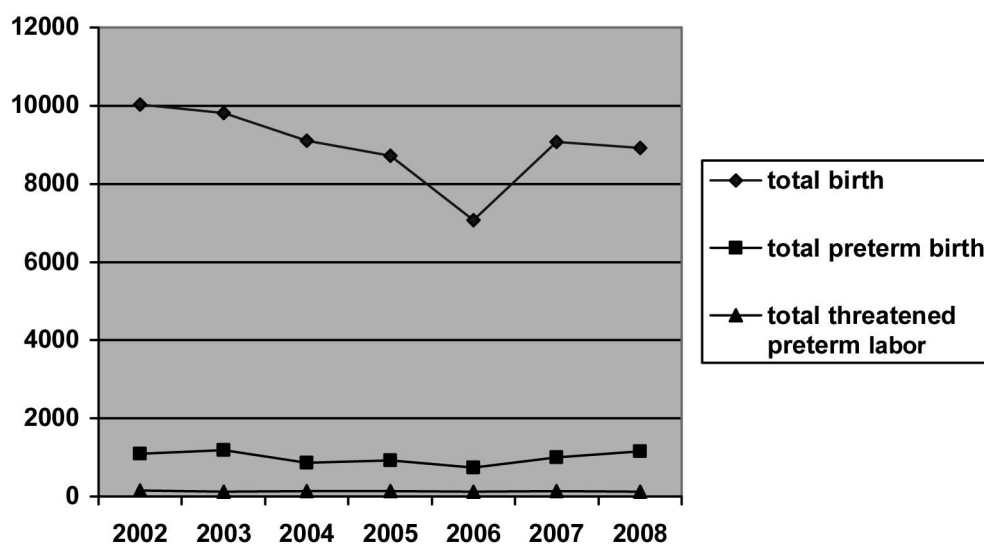


Fig. 1. Trends of total birth, preterm birth and threatened preterm labor during year 2002-2008.

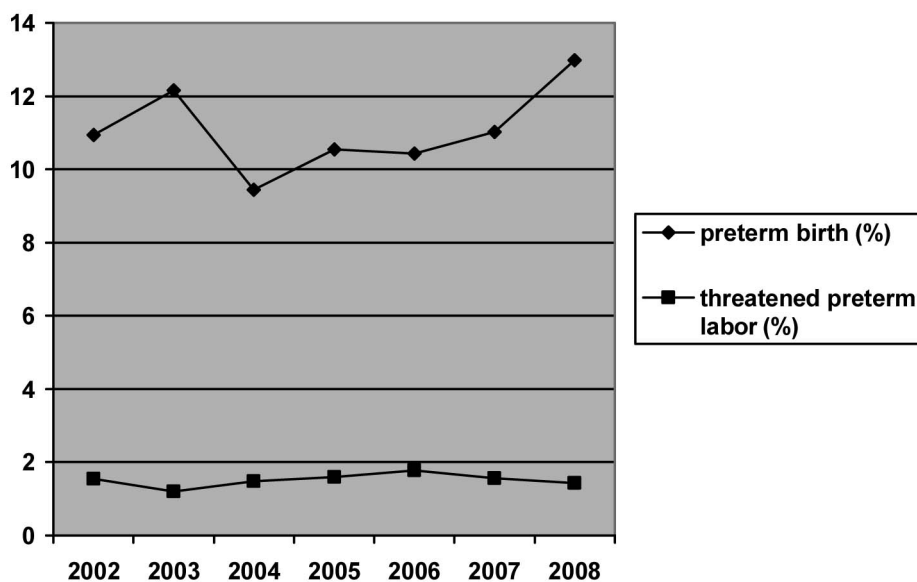


Fig. 2. Trends of percentage of preterm birth and threatened preterm labor during year 2002-2008.

Table 3. Neonatal birth weight in preterm birth during year 2002-2008.

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Extremely LBW (<1,000 grams) | 29 (2.6%) | 33 (2.8%) | 35 (4.1%) | 27 (2.9%) | 31 (4.2%) | 34 (3.4%) | 28 (2.4%) |
| Very LBW (1,000-1,499 grams) | 76 (6.9%) | 82 (6.9%) | 66 (7.7%) | 78 (8.5%) | 58 (7.9%) | 68 (6.8%) | 81 (7.0%) |
| LBW (1,500-2,499 grams) | 512 (46.6%) | 527 (44.2%) | 425 (49.5%) | 466 (50.7%) | 410 (55.6%) | 484 (48.4%) | 550 (47.5%) |
| Normal birth weight (2,500-2,999 grams) | 418 (38.1%) | 551 (46.2%) | 333 (38.8%) | 353 (38.4%) | 237 (32.1%) | 415 (41.5%) | 499 (43.1%) |
| Total | 1,098 | 1,193 | 859 | 919 | 738 | 1,001 | 1,158 |

*LBW = Low birth weight

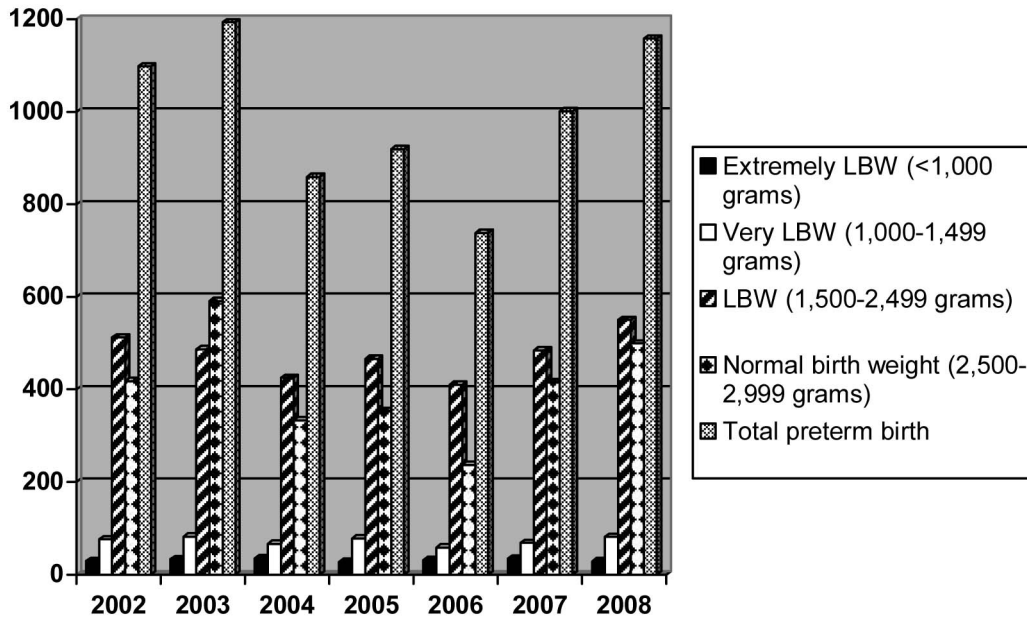


Fig. 3. Graph of neonatal birth weight which was classified as extremely, very and low birth weight and normal birth weight during year 2002-2008.

Table 4. Causes of early neonatal death during year 2002-2008.

| Causes of early neonatal death | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------------------------|------|------|------|------|------|------|------|
| *SGA, **LBW | 1 | 3 | 2 | 2 | 3 | 3 | 3 |
| prematurity | 3 | 1 | 0 | 1 | 2 | 1 | 0 |
| asphyxia | 6 | 5 | 3 | 0 | 2 | 2 | 2 |
| sepsis | 2 | 1 | 0 | 0 | 1 | 0 | 1 |
| fetal abnormality | 13 | 13 | 7 | 7 | 7 | 6 | 4 |
| chromosome abnormality | 1 | 0 | 0 | 1 | 1 | 1 | 1 |

*SGA = small for gestational age

**LBW = low birth weight

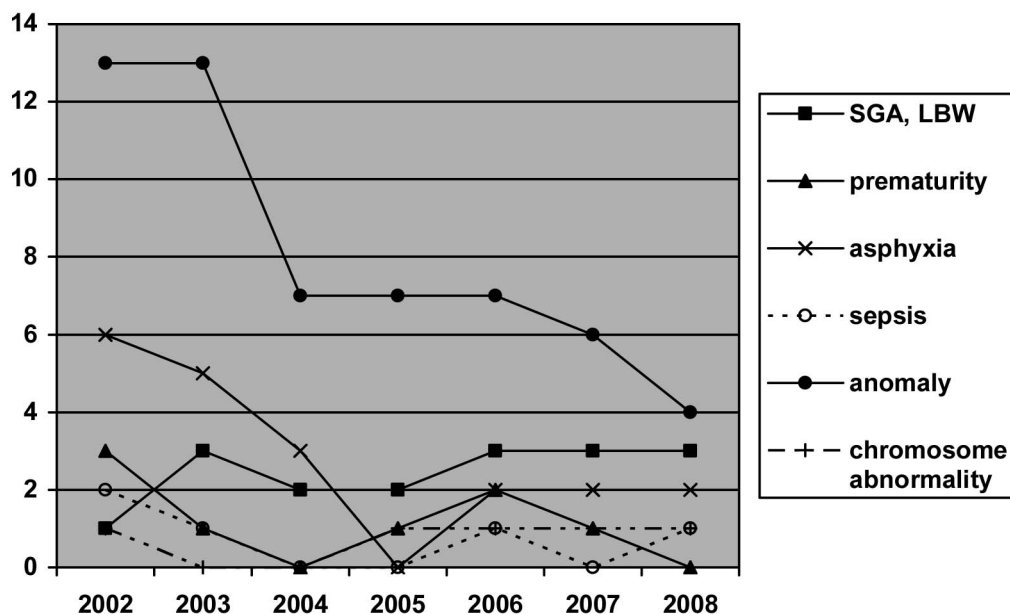


Fig. 4. Trends of cause of neonatal death during year 2002-2008.

Table 5. Cost of newborn care for complicated preterm birth in Siriraj Hospital, Bangkok and Thailand. (courtesy: Coratat T. Preterm birth :recent situation and effect. 2008)⁽¹²⁾

| Place | Neonatal birth/year | Preterm birth | Cost (bahts) |
|------------------|---------------------|---------------|-------------------------------|
| Siriraj Hospital | 9,198 | 131 | 22,925,000 (175,000/cases) |
| Bangkok | 117,601 | 1,646 | 288,050,000 |
| Thailand | 813,069 | 11,383 | 1,992,025,000 |

Discussion

From this study, the birth rate was decreased steadily during 2002-2006 but the rate of preterm birth was increased steadily from 2004 to 2008 (9.44%-12.98%). The rate of threatened preterm labor was constantly between 1.20 -1.78%. Low birth weight infant was mostly found among preterm birth. The sepsis and chromosome abnormality were the lowest causes of fetal death. Trend of neonatal death from prematurity had continuously decline and no early neonatal death in year 2008.

In the view of perinatal mortality rate, it continu-

ously declined and has been less than 10% in the last 10 years.⁽¹³⁾ Moreover it was interesting that in the year 2008, no premature baby was died. This can be explained that Siriraj Hospital is the super-tertiary center where the complicated cases were referred therefore preterm birth was consistently increased. During year 2006, there was policy of contract insurance which most of contract pregnant women were delivered in her local hospital. This resulted in the lowest preterm birth rate in year 2004 (9.44%). Moreover the improvement in obstetric and newborn care in Siriraj Hospital made changed in survival rate of premature baby. The

excellent equipments and well-trained neonatologists result in the best care of newborns. It is not surprised that very high costs of newborn care around 22,925,000 bahts/year or 175,000 bahts/ case in Siriraj Hospital was recorded.⁽¹²⁾

Premature infants with major congenital anomalies had higher mortality and morbidity rates. Premature survivors with major congenital anomalies were twice as likely to have neurodevelopmental impairment, have poor growth, and were at three times greater risk of rehospitalization when compared with extremely low birth weight infants without major anomalies.⁽¹⁴⁾ From this study, fetal abnormality had the highest mortality which included the referred cases to Siriraj Hospital.

The limit of viability is defined as the stage of maturity that would ensure a reasonable chance of survival without severe deficits. Determining the limit of viability is desirable in order to avoid the interventions that are costly in the extremely low birth weight infant who does not have a chance of survival.⁽¹⁵⁻¹⁷⁾ In Siriraj Hospital, the fetus below 24-26 weeks or birth weight less than 650 grams is defined as abortion that resulted in no fetal death in the year 2008.

Management of infants at the threshold of viability is challenging as it is uncertain which extremely preterm infant has a reasonable chance of survival without severe deficits especially those born at 23 or 24 weeks gestation.⁽¹⁸⁾ Survival rates in extremely premature infants include gestational age, birth weight, gender, and plurality. In making management decisions, these factors including gestational age should be considered when estimating the probability of a reasonable outcome in infants at or below 25 weeks gestation.^(15, 19)

In conclusion, this study showed that preterm birth rate was increased during 7 years and premature baby was almost survived. Improvement in preterm care results in the good neonatal outcome.

Acknowledgement

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การคลอดก่อนกำหนดที่โรงพยาบาลศิริราช : การศึกษาย้อนหลัง 7 ปี (พ.ศ. 2545-2551)

สายฝน ชวาลไพบูลย์, อนุวัฒน์ สุตันทวีบูลย์,

วัตถุประสงค์ : เพื่อศึกษาอัตราการคลอดก่อนกำหนด, น้ำหนักตัวของทารกแรกเกิด และสาเหตุการตายของทารกในช่วง 7 วันแรกเกิดทั้งหมดในช่วงระยะเวลา 7 ปี

วัสดุและวิธีการ : ได้ทำการเก็บและวิเคราะห์ข้อมูลจากรายงานทางสถิติของอัตราการคลอดก่อนกำหนดและน้ำหนักตัวของทารกแรกเกิด ในระยะเวลา 7 ปี ตั้งแต่ พ.ศ. 2545-2551

ผลการศึกษา : ในช่วง 7 ปี, พ.ศ. 2545-2551, อัตราการคลอดทั้งหมดลดลงตั้งแต่ปี พ.ศ. 2545- 2549 แต่มีจำนวนเพิ่มขึ้นทันทีในปี พ.ศ. 2550 และลดลงเล็กน้อยในปี พ.ศ. 2551 อัตราการคลอดก่อนกำหนดเพิ่มขึ้นเรื่อยๆ ตั้งแต่ปี พ.ศ. 2547- 2551 (ร้อยละ 9.44 ถึงร้อยละ 12.98) อัตราการเจ็บครรภ์คลอดก่อนกำหนดคุกคามมีอัตราคงที่ระหว่างร้อยละ 1.20-1.78 ในกลุ่มทารกที่คลอดก่อนกำหนด พบทารกที่มีน้ำหนักตัวน้อยมากที่สุด ยกเว้นปี พ.ศ. 2546, สาเหตุการตายของทารกในช่วง 7 วันแรกหลังคลอดส่วนใหญ่เกิดจากทารกที่มีความผิดปกติ ในขณะที่ทารกที่มีการติดเชื้อและความผิดปกติของโครโมโซมมีการตายน้อยที่สุด แนวโน้มของการเสียชีวิตของทารกแรกเกิดจากสาเหตุการคลอดก่อนกำหนดมีอัตราลดลงเรื่อยๆ และไม่มีทารกก่อนกำหนดเสียชีวิตเลยในปี พ.ศ. 2551

สรุป : จากการศึกษา 7 ปีย้อนหลัง พบว่าอัตราการคลอดก่อนกำหนดค่อนข้างคงที่ และมีชีวิตรอดเกือบทั้งหมด การคลอดก่อนกำหนดไม่ใช่สาเหตุการตายที่พบได้บ่อยที่สุดของทารกแรกคลอด
