Perinatal-Neonatal and Weight Specific Neonatal Mortality in Thailand in 1996 and Comparison with 1976 and 1986 : A Hospital Based Study

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Abstract

The study on perinatal mortality, neonatal mortality and weight specific death rate of neonatal infants born at Rajavithi Hospital in 1996 was carried out and compared with the rates of 1976 and 1986. It was found that in 1996 the total number of births was 15613 with 106 stillbirths. The perinatal mortality rate was 9.09 per 1000 births and neonatal mortality rate was 2.90 per 1000 live births. Reduction in perinatal and neonatal mortality rates from 1976 and 1986 to 1996 was observed. The neonatal mortality rate was close to the rate of developed countries but not the perinatal mortality rate. The weight specific neonatal mortality in 1996 was reduced from 1986 and 1976 in all weight groups. It is concluded that the neonatal mortality rate in 1996 was improved because of effective neonatal care. To reduce the low birth weight infant rate by means of an effective family planning program and antenatal care may improve the perinatal mortality rate at Rajavithi Hospital.

The mortality rate is an indicator of pubic health related to socio - economic and sanitary conditions. The majority of mortality in a population occurs during infancy. In the United States,(1) the infant and neonatal mortality rates were 7.9 and 5 respectively in 1994, whereas Japan(2) had a neonatal rate of 2.65 per 1000 live births. The infant mortality rate is higher in developing countries(3-6). The study at Rajavithi Hospital reported a perinatal and neonatal mortality rate in 1976 of 27.43 and 17.90, in 1986 of 14.08 and 9.30 respectively(7). Neonatal mortality rate was the major contribution to the infant mortality rate and inverse related to birth weight, gestational age and racial differences(8,9).

The objective of this study was to determine the perinatal and neonatal mortality rate and the contribution of individual birth weight groups to the reduction in neonatal mortality rate of infants born at Rajavithi Hospital in 1996 by comparison with the rates of 1976 and 1986.

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MATERIAL AND METHOD

The medical records of mothers and infants born at Rajavithi Hospital from January 1, 1996 to December 31, 1996 were reviewed. The infants were divided according to their birth weight into 8 groups as birth weight groups of 500-999, 1000-1499, 1500-1999, 2000-2499, 2500-2999, 3000-3499, 3500-3999 and > 4000 grams. The number of births, deaths in each group at the perinatal and neonatal period were recorded.

The perinatal mortality rate, neonatal mortality rate and birth specific death rate were calculated according to the following formulas.

Data of the year 1996 were compared, with data of 1976 and 1986 studied by Tricharon[7].

$P < 0.05$ is accepted to be a statistical significant difference.

RESULT

The total number of deliveries in 1996 was 15613 with 106 stillbriths and 15,507 livebirths (Table 1). At each different period of time, the infant death rate of the lower and higher birth weight was higher than that of 2500-3999 birth weight infants. Stillbirth was high and responsive to 74.65 per cent (106 out of 142) of perinatal

$$\text{Perinatal mortality rate} = \frac{\text{No. of deaths under 7 days + No. of stillbirth}}{\text{No. of births}} \times 1000$$

$$\text{Neonatal mortality rate} = \frac{\text{No. of deaths before 28 days}}{\text{No. of livebirths}} \times 1000$$

$$\text{Weight specific death rate} = \frac{\text{No. of deaths in the specific weight group}}{\text{Total in that group}} \times 1000$$

Table 1. Number of birth and death of infants born at Rajavithi Hospital in 1996.

Body weight (grams) / Categories	500-999	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	> 4000	Total
Births No. (%)	56. (0.36)	124 (0.74)	278 (7.65)	1195 (7.65)	5594 (35.83)	6628 (35.83)	1759 (11.27)	279 (1.79)	15613 (100)
Stillbirths No. (%)	25 (23.58)	24 (22.64)	18 (16.04)	17 (16.04)	11 (10.38)	6 (5.66)	4 (3.77)	1 (0.95)	106 (100)
Livebirths No. (%)	31 (0.20)	100 (0.64)	260 (1.68)	1178 (7.60)	5583 (36.00)	6322 (40.77)	1755 (11.32)	278 (1.79)	15507 (100)
Early neonatal death No. (%)	17 (47.22)	9 (25.00)	5 (13.78)	1 (2.78)	2 (5.56)	1 (2.78)	1 (2.78)	0.(0)	36 (100)
Perinatal death No. (%)	42 (29.58)	33 (23.24)	23 (16.20)	18 (12.68)	13 (9.15)	7 (4.93)	5 (3.52)	1 (0.70)	142 (100)
Late neonatal deaths No. (%)	1 (11.11)	2 (22.22)	0 (0)	4 (44.45)	0 (0)	0 (0)	1 (2.22)	1 (11.11)	9 (100)
Neonatal deaths No. (%)	18 (40.00)	11 (24.44)	5 (11.11)	5 (11.11)	2 (4.45)	1 (2.22)	2 (4.45)	1 (2.22)	45 (100

deaths. The perinatal and neonatal mortality rates in 1996 were 9.09 and 2.90 respectively (Table 2). The perinatal and neonatal mortality rates were significantly different between 1976, 1986 and 1996. The reduction in perinatal mortality rate from 1976 to 1986, 1986 to 1996 and 1976 to 1996 was 48.67, 35.44 and 66.86 per cent respectively. The reduction in neonatal mortality rate from 1976

Table 2. Perinatal and neonatal mortality rates of infants born at Rajavithi in 1996 and comparison with 1976 and 1986.

	1976	1986	1996	P*	% Reduction in mortality rate from		
					1976 to 1986	1986 to 1996	1976 to 1996
Perinatal mortality rate per 1000 births	27.46	14.08	9.09	<0.05	48.67	35.44	66.86
Early neonatal mortality rate per 1000 livebirths			2.32				
Late neonatal mortality rate per 1000 livebirths			0.58				
Neonatal mortality rate per 1000 livebirths	14.08	9.30	2.90	<0.05	33.94	68.82	79.40

Table 3. The incidence of low birth weight, very low birth weight and very very low birth weight infants born at Rajavithi Hospital in 1976, 1986 and 1996.

Year / Infants	1976	1986	1996	P*
Low birth weight (%) (birth weight of < 2500 grams)	11.44	9.65	10.12	> 0.05
Very low birth weight (%) (birth weight of < 1500 grams)	10.48	8.26	8.38	> 0.05
Very very low birth weight (%) (birth weight of < 1000grams)	0.17	0.11	0.2	> 0.05
Total number of live births	21185	19739	15507	

P* = difference value between 1976, 1986 and 1996.

to 1986, 1986 to 1996 and 1976 to 1996 was 33.94, 68.82 and 79.40 percent respectively. The low birth weight, very low birth weight and very very low birth weight rates in 1996 were 10.12, 8.32 and 0.2 per cent respectively. There was no difference in the incidence of low birth weight, very low birth weight and very very low birth weight rate between 1976, 1986 and 1996 ($P > 0.05$) (Table 3). The specific neonatal mortality rates were significantly different in all groups of birth weight except groups with a birth weight of 3000-3499, 3500-3999 and > 4000 grams of which a small number of deaths occurred (Table 4). The overall percentage of reduction in weight specific neonatal mortality rate from 1976 to 1986, 1986 to 1996 and 1976 to 1996 in the weight group of 500-999 grams was 11.11, 34.23 and 42.06 ; the group of 1000-1499 grams was 15.74, 76.11 and 78.87 ; the group of 1500-1999 grams was 52.62, 83.93 and 92.38 ; the group of 2000-2499 grams was 58.82, 70.51 and 87.25 ; the group of 2500-2999 grams was 40.63, 90.02 and 94.08 ; the group of 3000-3499 grams was 26.02, 88.97 and 67.34 ; and the group of > 4000 grams was 29.29, 42.16 and 38.74. Therefore, the improvements of weight specific neonatal mortality rate were found in all birth weight groups.

DISCUSSION

Queen Sirikit National Institute of Child Health (former Children's Hospital, Bangkok, Thailand) has the responsibility for providing medical care to all neonates born at Rajavithi Hospital. The institute established a neonatal intensive care unit in 1981. Our study found that after the introduction of a neonatal intensive care unit, the perinatal and neonatal mortality rate decreased in 1986 and 1996. It was concluded that the effectiveness of neonatal intensive care is measured by the assessment of the reduction of birth specific neonatal mortality rate in all birth weight groups[10]. In our study, the weight specific neonatal mortality rates were found greatly reduced in all birth weight groups, which suggested the effectiveness of our intensive care unit. We observed that even though our neonatal mortality rate in 1996 was close to the rate of developed countries,[1,2] the perinatal mortality still remained higher. Perinatal mortality is often taken as an indicator of the quality of obstetric care. In this study we noticed that the rates of low birth

Table 4. Weight specitic neonatal mortality rates of infants born at Rajavithi Hospital in 1976, 1986 and 1996.

Year / Weight (grams)	Neonatal mortality rate			% Reduction in neonatal mortality rate from		
	1976	1986	1996	1976 to 1986	1986 to 1998	1976 to 1996
500 - 999	1000.00	881.82	580.00*	11.11	34.23	42.00
1000 - 1499	546.45	460.43	110.00*	15.74	76.11	78.87
1500 - 1999	252.47	119.63	19.23*	52.62	83.93	92.38
2000 - 2499	34.68	14.28	4.24*	58.82	70.57	87.25
2500 - 2999	6.08	3.61	0.36*	40.63	90.02	94.08
3000 - 3499	1.96	1.45	0.16	26.02	88.97	91.84
3500 - 3999	3.49	1.49	1.14	57.31	23.50	67.34
> 4000	8.75	6.19	5.38	29.29	42.16	38.74

* = P value < 0.05

weight, very low birth weight and very very low birth weight in 1996 were not significantly different from 1976 and 1986. We also observed a high stillbirth rate (74.65 per cent of perinatal deaths). Reducing the lower birth weight rate by improving antenatal care and effective family planning may improve the perinatal mortality rate of Rajavithi Hospital.

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อัตราตายระยะปริกำเนิด–แรกเกิด และอัตราตายจำเพาะน้ำหนักแรกเกิดของทารกไทย พ.ศ. 2539 เปรียบเทียบ พ.ศ. 2519 และ พ.ศ. 2529 : การศึกษาในทารกคลอดที่โรงพยาบาลราชวิถี

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ได้ศึกษาอัตราการตายระยะปริกำเนิด และอัตราการตายจำเพาะน้ำหนักแรกเกิดของทารกคลอด พ.ศ. 2539 เปรียบเทียบ พ.ศ. 2519 และ พ.ศ. 2529 ที่โรงพยาบาลราชวิถี พบว่า มีการคลอดใน พ.ศ. 2539 จำนวน 15613 ราย และทารกคลอดไร้ชีพ 106 ราย อัตราตาย ระยะปริกำเนิด 9.09 ต่อการคลอด 1000 ราย และอัตราตายระยะทารกแรกเกิด 2.9 ต่อการคลอดมีชีพ 1000 ราย อัตราตายปริกำเนิดและอัตราตายของทารกแรกเกิดลดลงในปี พ.ศ. 2539 อย่างเห็นชัดจากปี พ.ศ. 2519 และ พ.ศ. 2529 อัตราการตายระยะวัยแรกเกิดใกล้เคียงกับประเทศที่พัฒนาแล้ว แต่อัตราตายระยะปริกำเนิดยังคงสูงกว่า และอัตราตายจำเพาะน้ำหนักแรกเกิดลดลงในทุกกลุ่มน้ำหนัก ในปี พ.ศ. 2539 เมื่อเปรียบเทียบปี พ.ศ. 2519 และ พ.ศ. 2529 การศึกษานี้แสดงให้เห็นว่าอัตราการตายวัยแรกเกิดลดลงเนื่องจากมีการดูแลรักษาทารกวัยแรกเกิดอย่างมีประสิทธิภาพ และการจะลดอัตราตายปริกำเนิดให้มากกว่านี้อาจทำได้ด้วยการลดอัตราการเกิดทารกน้ำหนักตัวน้อยโดยการวางแผนครอบครัวและการดูแลครรภ์อย่างดี

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