OBSTETRICS

Maternal Mortality and Referral Status in Chonburi Hospital: 16 Years (1996-2011) Experience

Teerapat Chullapram MD.

Department of Obstetrics and Gynecology, Chonburi Hospital, Chonburi, Thailand

ABSTRACT

Objective: To assess the cause of maternal death and maternal mortality ratio in Chonburi Hospital

Materials and Methods: All maternal deaths in Chonburi Hospital from January 1996 to December 2011 were included. Data from the department and the hospital medical records was review.

Results: Total maternal mortality ratio (tMMR, total = referred cases plus Chonburi Hospital own cases) and Chonburi Hospital maternal mortality ratio (CHMMR, Chonburi Hospital own cases) was 52.4 and 13.4 per 100,000 live births, respectively. The tMMR rate seemed unchanged from tMMR during 1982-1991. However, the figure for all 47 deaths was exaggerated because there were added referred maternal deaths without added corresponding live births. Most of the maternal deaths (74%) were referred cases. Most deaths (63.8%) were direct maternal deaths. Five most common causes of deaths were postpartum hemorrhage (PPH), amniotic fluid embolism (AFE), heart diseases, pregnancy-induced hypertension (PIH) and abortion/ectopic pregnancy-related. For Chonburi Hospital cases, most common causes of death were AFE, heart diseases and PIH. Most of the referred cases, 74.3%, arrived at Chonburi Hospital in seriously ill condition. Eight cases (22.9%) arrived hopelessly (post cardiac arrest or cardiac arrest on admission, brain death or moribund condition). Many deaths were obviously or possibly preventable especially in category of PPH and abortion/ectopic pregnancy-related deaths.

Conclusion: Our own CHMMR was 13.4 per 100,000 live births and comparable with that of the developed country. Our tMMR, though a bit exaggerated, was the same as other developing country MMR. There is the opportunity for improvement as many deaths were preventable.

Keywords: maternal mortality ratio, MMR, refer, Chonburi Hospital

Introduction

In 2010, the global maternal mortality ratio (MMR) was 210 per 100,000 live births. The figure decreased 47% from 400 per 100,000 live births in 1990. Chad and Somalia had extremely high MMRs at 1,100 and 1,000 per 100,000 live births, respectively. The ratio was 150 and 48 per 100,000 live births in Southeast Asia and Thailand, respectively. In developed countries, the MMR was 16. The lowest figures were at 2 per 100,000 live births in Estonia and 3 per 100,000 live births in Singapore and Greece[1].

Chonburi Hospital (CH) is one of referral, regional or tertiary hospitals in Thailand. Patients are referred from nearby community, general hospital as well as

private hospitals[2]. We found that our official MMR was much underreported. We also noted that there were two different subpopulations in all deaths. The first group was Chonburi Hospital own cases and the other group was referred from nearby hospitals. In the early study, we did not have complete record of the referral status of the patients. We later prospectively recorded all maternal deaths as well as their referral status. In this study, we expected to see the trend in our MMR compared with our previous report and whether there was any difference between the two subgroups according to the referral status.

Materials & Methods

All maternal deaths in our hospital from January 1996 to December 2011 were included. Each case would be subgroup into either Chonburi Hospital own case (CH) or referred case. Maternal mortality ratio (MMR) was calculated by dividing number of maternal deaths by total live births then multiplying the figure with 105 for each group. CH death and Chonburi Hospital maternal mortality ratio (CHMMR) included only maternal deaths in Chonburi Hospital own cases. Total death and total maternal mortality ratio (tMMR) included both maternal deaths in Chonburi Hospital own and referred cases. Maternal death was classified as either direct or indirect maternal death. Hospital and department-own records on all maternal deaths as well as root cause analysis (RCA) reports were reviewed. As medical records in the early years of this study were destroyed, the detail of some cases were retrieved from the department data. SPSS Statistics 17.0 was used for statistical analysis. Percentage, mean and standard deviation were calculated for descriptive variables. In the subgroup analysis, we use chi square for comparing nominal variables and t test for interval or ratio variables.

Results

Table 1. Live births and maternal deaths on yearly basis from 1996 to 2011.

Year	Live births	Total death	tMMR	CH death	CHMMR
1996	6,008	4	66.6	2	33.3
1997	6,115	3	49.1		0.0
1998	5,628	3	53.3		0.0
1999	5,227	2	38.3		0.0
2000	5,120	4	78.1	1	19.5
2001	4,805	2	41.6	2	41.6
2002	4,752	2	42.1		0.0
2003	4,724	3	63.5		0.0
2004	5,039	1	19.8		0.0
2005	5,163	5	96.8		0.0
2006	5,323	1	18.8	1	18.8
2007	6,137	8	130.4	1	16.3
2008	6,489	1	15.4	1	15.4
2009	6,466	2	30.9	2	30.9
2010	5,997	5	83.4	1	16.7
2011	6,617	1	15.1	1	15.1
Total	89,610	47	52.4	12	13.4

CH= case who was not a referred case

tMMR= total maternal mortality ratio including both referred and CH cases

CHMMR= maternal mortality ratio including only mothers who were not referred cases

There were 47 maternal deaths and 89,610 live births over the 16-year period from 1996 to 2011 (Table1). Therefore, overall MMR (maternal mortality ratio) was 52.4 per 100,000 live births (range 15.1- 130.4). Of the 47 maternal deaths, 35 (74.5%) were referred from other hospitals. Twelve deaths were our own cases and this made our own MMR 13.4 per 100,000 live births (range 0-41.6).

Table 2. Comparison of MMR in Chonburi Hospital between 2 periods (1982-1991 and 1996-2011).

	Maternal deaths	**Live births**	**Maternal death/100,000 live births**
1982-1991	27	52,805	51.1
1996-2011	47	89,610	52.4

p = 0.9160

There was no change in MMR compared to 1982-1991 (Table 2).

Table 3. Patient's characteristics.

	CH N=12	Referred N=35	Total N=47	p
Age (years)	29.6(8.6)	N=35	28.8(6.6)	0.654
Parity (n CH=8, referred=22)	0.88(0.84)	0.91(0.92)	0.90(0.89)	0.928
Type of pregnancy at death				0.415
Ectopic pregnancy	0(0.0)	3(8.6)	3(6.4)	
Abortion	0(0.0)	3(8.6)	3(6.4)	
Intrauterine pregnancy(abortion excluded)				
Ante partum	2(16.7)	9(25.7)	11(23.4)	
Postpartum	10(83.3)	19(54.3)	29(61.7)	
No data	0(0.0)	1(2.9)	1(2.1)	
Condition on first admission				0.299
Healthy	8(66.7)	13(37.1)	21(44.7)	
Ill	1(8.3)	0(0.0)	1(2.1)	
Heart failure	1(8.3)	3(8.6)	4(8.5)	
Respiratory failure	0	1(2.9)	1(2.1)	
Shock	0	2(5.7)	2(4.3)	
Unconscious	0	5(14.3)	5(10.6)	
Cardiac arrest	0	2(5.7)	2(4.3)	
No data	2(16.7)	9(25.7)	11(23.4)	
Clinical-on-arrival of referred cases (n=35)				
Ill		1(2.9)		
Heart failure		1(2.9)		
Unconscious		6(17.1)		
Unconscious and shock		1(2.9)		
Shock		10(28.6)		
Brain death		1(2.9)		
Moribund		2(5.7)		
Post cardiac arrest		2(5.7)		
Cardiac arrest		3(8.6)		
No data		8(22.9)		

CPR before arrival			
No		16(45.7)	
Yes*		8(22.9)	
No data		11(31.4)	
Total		35(100.0)	
Place of delivery/abortion			0.000
Undelivered	2(16.7)	9(25.7)	12(25.5)
Delivery room	6(50.0)	0(0.0)	6(12.8)
Medicine inpatient department	0(0.0)	3(8.6)	2(4.3)
Medical intensive care unit	1(8.3)	0(0.0)	1(2.1)
Operating room	2(16.7)	4(11.4)	6(12.8)
Referring hospital	0(0.0)	16(45.7)	16(34.0)
No data	1(8.3)	3(8.6)	4(8.5)

*4 AFE, 1heart disease, 1 obstetric hemorrhage, 1 pregnancy induced hypertension and 1 acute respiratory failure

Data presented as mean $\pm$ SD or n(%)

Table 3 demonstrated patient's characteristics. The average age was 28.8$\pm$6.6 years. Most deaths occurred after delivery or abortion (61.7%). Ectopic pregnancy and abortion-related deaths accounted for 12.8% of all deaths. Forty-eight percent of mothers arrived at the first hospital (referred or CH) in healthy condition and 29.8% arrived in seriously ill conditions i.e. heart failure, respiratory failure, unconscious, shock or cardiac arrest. Most of the referred cases (74.3%), arrived at Chonburi Hospital in seriously ill conditions. Eight cases (22.9%) arrived hopelessly: 3 had cardiac arrest on arrival, 2 were referred after cardiac arrest, 2 were moribund and 1 had brain death. Twenty-two percent of cases had CPR before referring. The comparison between referred and CH cases showed no significant difference on the patients' characteristics except for the place of delivery. Sixteen cases (45.7%) of referred cases delivered at the referring hospitals.

Table 4. Direct and indirect causes of maternal death.

	CH	%	Referred	%	Total	%
Direct	8	66.7	22	62.9	30	63.8
Indirect	4	33.3	13	37.1	17	36.2
	12	100.0	35	100.0	47	100.0

p = 0.813

Table 5. Causes of maternal death.

	Causes of death	CH	%	Referred	%	Total	%
direct	Obstetric hemorrhage	1	8.3	8	22.9	9	19.1
	AFE	4	33.3	4	11.4	8	17.0
	Abortion-related			6	17.1	6	12.8
	PIH	2	16.7	4	11.4	6	12.8
	Infection	1	8.3		0.0	1	2.1
indirect	Heart disease	3	25.0	4	11.4	7	14.9
	Respiratory disease			2	5.7	2	4.3
	Renal disease			2	5.7	2	4.3
	Other indirect cause	1	8.3	5	14.3	6	12.8
Total		12	100	35	100.0	47	100

p = 0.180

Direct maternal death accounted for 63.8% of all deaths. There was no significant difference between CH cases or referred cases when subgroup analysis was done (Table 4). Obstetric hemorrhage was the most common cause of death (19.1%) followed by amniotic fluid embolism (AFE), heart diseases, pregnancy induced hypertension (PIH) and abortion-related, respectively. In indirect maternal deaths, most deaths were from cardiac conditions.

There was 12 maternal deaths in CH: 8 were direct maternal deaths. Two out of 4 had AFE which had sudden collapse just after spontaneous membrane rupture. One patient collapsed right after cesarean section (CS) and one collapsed just after vaginal delivery. Two patients had severe PIH with pulmonary edema. There was only one death from PPH. The patient collapsed in operating room during emergency hysterectomy for uncontrolled PPH. The only mother who died from puerperal sepsis in our study had uneventful delivery. She was re-admitted a few days after delivery with severe sepsis unresponsive to medical treatment. In indirect maternal death group, 3 died from heart disease. One had tetralogy of Fallot (TOF), one had myocarditis and the last one had congestive heart failure (CHF). Another indirect maternal death was a case with acquired immune deficiency syndrome (AIDS).

Thirty-five maternal deaths were referred from other hospitals. Twenty two (62.9%) were direct maternal death. There were 8 deaths from PPH. One had uterine inversion and incorrect technique of uterine replacement caused severe birth canal injuries and extensive PPH. One had uterine rupture after dystocia and fundal pressure. One had placental abruption. One had PPH after termination of pregnancy with misoprostol from fetal death in utero. She had retained placenta and PPH. Another 4 patients, one had PPH from birth canal injury and uterine atony, the rest had PPH after normal delivery.

All 6 abortion-related deaths were referred cases. Three cases had ectopic pregnancy: one had abdominal pregnancy, one had ectopic pregnancy with shock and one had ectopic pregnancy with post-operative pulmonary edema. Three cases were related to abortion: one with sepsis, one with uterine perforation leading to severe bleeding and one with uterine perforation and bowel injury. There were 4 cases of AFE: one case collapsed just after cesarean delivery, two after vaginal delivery and one at the second stage of labor.

Four died from PIH. One had severe PIH with pulmonary edema, one had DIC and shock, one had eclampsia with intracerebral hemorrhage and another one had brain death. Four died from heart disease: 2

had TOF, 1 had patent ductus arteriosus (PDA) and 1 had valvular heart disease. Two died from respiratory problem: on with severe asthma and the other with severe pneumonia. Five other indirect maternal deaths included 2 cases with hypertension and strokes, 1 had intraventricular hemorrhage from ruptured arteriovenous malformation (AVM), 1 had viral encephalitis and 1 had dengue hemorrhagic fever. There was not much detail for 2 cases with renal failure as they were in the first 2 years of this study.

Table 6. Condition on arrival at first admission either at Chonburi Hospital or referring hospitals in different cause of death.

refer	COD	healthy	ill	HF	shock	U	U&S	RF	BD	M	PA	CA	no data	total
no	AFE	3											1	4
no	heart disease	1		1									1	3
no	PIH	2												2
no	infection	1												1
no	obstetric hemorrhage	1												1
no	other indirect cause		1											1
yes	obstetric hemorrhage	8												8
yes	abortion-related	1			2								3	6
yes	other indirect cause					4							1	5
yes	AFE	3										1		4
yes	heart disease		2										2	4
yes	PIH	1	1			1							1	4
yes	renal disease												2	2
yes	respiratory disease							1				1		2
	total	21	1	4	2	5		1				2	11	47

HF=heart failure, U=unconscious, U&S=unconscious and shock, RF= respiratory failure, BD=brain death, M=moribund, PA=post cardiac arrest, CA= cardiac arrest, AFE = amniotic fluid embolism, PIH = pregnancy induced hypertension

All obstetric hemorrhage (PPH) arrived at the first hospital (Chonburi Hospital or referring ones) in healthy condition. Most AFE arrived in healthy condition. Three of seven cases with heart disease had heart failure on admission. Half of PIH cases arrived healthy.

Table 7. Maternal condition at arrival in the referred cases.

refer	COD	healthy	ill	HF	shock	U	U&S	RF	BD	M	PA	CA	no data	total
yes	abortion-related		1		4								1	6
yes	AFE				1		1			1	1			4
yes	heart disease			1							1		2	4
yes	obstetric hemorrhage				4							3	1	8
yes	other indirect cause		1			4								5
yes	PIH				1	1				1			1	4
yes	renal disease												2	2
yes	respiratory disease							1	1					2
	total	0	2	1	10	5	1	1	1	2	2	3	7	35

HF=heart failure, U=unconscious, U&S=unconscious and shock, RF= respiratory failure, BD=brain death, M=moribund, PA=post cardiac arrest, CA= cardiac arrest, AFE = amniotic fluid embolism, PIH = pregnancy induced hypertension

Table 8. CPR before arrival VS condition on arrival for referred cases.

CPR-before-arrival\clinical on arrival	Healthy	Ill	HF	Shock	U	U&S	RF	BD	M	PA	CA	No data	total
No		2	1	6	4		1				2		16
Yes				1		1		1	2	2	1		8
No data				3	1							7	11
Total		2	1	10	5	1	1	1	2	2	3	7	35

HF=heart failure, U=unconscious, U&S=unconscious and shock, RF= respiratory failure, BD=brain death, M=moribund, PA=post cardiac arrest and CA= cardiac arrest

No matter what the diagnosis was, most (26/35=74.3%) referred cases arrived at Chonburi Hospital in seriously ill conditions. Nearly all referred cases with PPH (87.5%) arrived at Chonburi Hospital either with shock, unconscious, post cardiac arrest or with cardiac arrest on admission. Of the cases who had CPR before arrival, 75% were with either brain death, moribund, post arrest or cardiac arrest on admission. Three cases with PPH arrived with cardiac arrest.

For our own cases, AFE, heart disease and PIH seemed to scatter throughout the period. Puerperal sepsis was rare as well as PPH which has never been the cause of death for 10-11 years.

Discussion

The MMR is used as a measurement of the quality of a health care system. Improvement needs complete process of maternal mortality action cycle: identification of cases of maternal death, collection of information about the cases, review and analysis of the data, development and implementation of interventions, and evaluation[3].

Getting correct figure is prime task, otherwise incorrect figure would lead to incorrect assumptions and actions. Globally, an important challenge is that a majority of countries still lack a complete civil registration system with good attribution of cause of death, making it challenging to assess accurately the extent of maternal death situation[1]. Underreport is possible even in the developed country where there is good routine death registration[4-7]. In the US, a study in 1995–97 found that 35 percent more maternal deaths are identified through surveillance efforts than solely by the death certificate[8]. In our previous study, searching from hospital annual reports revealed only 6 out of 27 maternal deaths[2]. Since then, our Department of Obstetrics & Gynecology has actively recorded each maternal death prospectively. Destruction of old medical records is regular practice. There should be proper medical record appraisal and archiving so that those records that are of value will not be eliminated but kept in electronic form[9].

A total of 47 maternal deaths in the 16 years period made our MMR 52.4 per 100,000 live births. The figure seemed to correspond roughly to the reported Thailand's MMR of 48 per 100,000 live births in 2010[1]. However, Chonburi Hospital is a tertiary center, therefore, cases have been referred from several nearby hospitals. All 35 referred cases were from 13 hospitals. The closest one is 15 km and the farthest is 96 km away. The average distance was 38 km. The referral cases made the MMR figure a bit exaggerated as 35 deaths were added to our own 12 without any add-up with corresponding live births for those 35 cases from all those 13 referring hospitals. Getting the correct MMR for those 47 deaths may not be easy even we get all live births from all 13 hospitals as Chonburi Hospital might not be the sole referral hospital from them throughout those 16 years period. We, however, could precisely calculate our MMR and the result was 13.4 per 100,000 live births. This figure correlates well with MMR of 16 per 100,000 live births in developed countries[1]. Global MMR in 2010 was 47% less than the ratio in 1990[1]. Our MMR seemed unchanged.

Most deaths were direct maternal deaths. In our 12 deaths, AFE was the leading cause of death (33.3%) followed by heart diseases (25.0%) and PIH (16.7%).

Among the referred cases, obstetric hemorrhage was the most common cause, followed by abortion-related death, AFE, heart diseases and PIH at 11.4% each.

Table 9. Comparison of reported or calculated maternal deaths by causes per 100,000 LB in Chonburi Hospital and rest of the world

	Developed countries	Australia 2000-2	Developing countries	CH	CH+ref
Hemorrhage	2.14	3.12	77.50	1.12	10.04
Hypertensive disorders	2.58	1.39	23.08	2.23	6.70
Sepsis/infections	0.34	1.73	24.90	1.12	1.12
Abortion	1.31	0.00	11.64	0.00	3.35
Obstructed labour	0.00	0.00	15.46	0.00	0.00
Anemia	0.00	0.00	17.08	0.00	0.00
Ectopic pregnancy	0.78	0.00	0.83	0.00	3.35
Embolism	2.38	3.46	3.21	4.46	8.93
Other direct causes	3.41	0.00	8.61	0.00	0.00
HIV/AIDS	0.00	0.00	8.65	0.00	0.00
Other indirect causes	2.30	0.00	35.22	0.00	0.00
Combined direct	12.94	9.70	182.30	8.93	33.48
Combined indirect	2.30	1.40	43.87	4.46	18.97
Unclassified deaths	0.77	0.00	14.08	0.00	0.00
MMR	16.0	11.1	240.2	13.4	52.4

CH = Chonburi Hospital, ref = referred

In Table 9, all MMRs were real figures. The different causes of death per 100,000 live births in our report and the Australian study[10] were real figures. The figures in developed and developing countries were calculated from 2 reports[1,11].

Not only our CHMMR but also death profile corresponded well with those of the developed countries (Table 9). The tMMR was higher and the cause of death was different from that of developed countries but was much better than the developing country profile.

The United Nation (UN) Pillars of Safe Motherhood, established as part of the Safe Motherhood Initiative in 1997, describe three cost-effective population-level approaches with the capacity to prevent up to 80% of maternal deaths: comprehensive reproductive health care, presence of skilled health professionals at delivery and emergency obstetric care[12]. Most maternal deaths are avoidable[13]. The purpose of maternal mortality review is to learn lessons and identify what could have been changed to reduce the risk of maternal death[3]. We assumed that all or most of abortion-related death, PPH and puerperal infection are preventable. If all were prevented, our total deaths and MMR would decrease to 31 and 34.6, respectively. And our own death cases and MMR would be down to 10 and 11.2, respectively. May be the best possible figure would be 8.93 and 4.46 for tMMR and CHMMR if only AFE/embolism was the only cause of death.

In our study, 89% of deaths from PPH and 100% of abortion-related deaths were referred cases. Majority of them arrived at Chonburi Hospital in at least shock state. Sixty seven percent of abortion-related deaths arrived in shock state and for deaths from PPH, 50% arrived in shock state and 37.5% arrived with cardiac

arrest. Most deaths from these two conditions should be prevented either by good curettage technique or early surgical intervention i.e. hysterectomy in PPH and exploratory laparotomy in ectopic pregnancy, appropriate third stage management, appropriate uterine inversion management/supervision, avoid fundal pressure, good and safe transfer. Referring the case sometimes puts the patient at risk of irreversible shock. Lack of doctors, nurses, health care personnel, as well as other limitations makes it difficult for many community or even general hospitals to perform necessary operation. Recent lawsuits made things worse because few doctors want to take risk treating or performing operation by themselves. Maternal referral systems have been under-documented and under-researched. There is evidence that great gains can be made in maternal health by ensuring that women with complications can get quick and efficient referral system[14].

It seems we are still far from the developed country standard but if we want to reach that standard, the health care services as a whole need to improve in several aspects. Health care personnel should perform procedures correctly and safely (uterine perforation from curettage) and seek supervision or consultation whenever the situation is beyond the ability (retained placenta and uterine inversion and replacement back of uterine inversion). Community and general hospitals should get supports to improve their capability to do the life-saving procedures, as in many cases, referral means death. The referral time should be short and the referral quality should be improved, i.e. keep the patient's condition stable before referral. When patients arrive, tertiary or compatible hospitals should be capable of taking care, giving early surgical intervention if needed and early detection of pre-arrest signs. Moreover, the Intensive care unit (ICU) should be readily available and non-obstetric teams (medical or surgical) should be available to join if treatment are needed. Correctable disease such as severe valvular or congenital heart disease should be treated before the women become pregnant. Good family planning is also important as fewer pregnancies mean fewer deaths.

Conclusion

Our tMMR was 52.4 per 100,000 live births and CHMMR was 13.4 per 100,000 live births during 16-year period from 1996-2011. The ratio seems unchanged from previously reported of tMMR in 1982-1991. Most (74%) were referred cases. Most deaths were direct maternal deaths. Top five causes of deaths were PPH, AFE, heart diseases, PIH and abortion-related, respectively. For Chonburi Hospital cases, top causes of death were AFE, heart diseases and PIH. Our CHMMR as well as causes of death profile was comparable to the developed countries. Our tMMR, which were somewhat exaggerated as described above, was compatible with ratio of developing countries. Many deaths were obviously or possibly preventable especially in category of PPH and abortion-related deaths. In order to reach developed country standard, our MMR needs to decrease to one-third or one-fourth of our present ratio. Although it seems difficult to reach that goal but as the patients are still in our hands, we need to improve for the sake of them.

References
1. WHO, UNICEF, UNFPA, The World Bank. Trends in maternal mortality: 1990 to 2010. Geneva, World Health Organization, 2012.
2. Pinchun P, Chullapram T. A 10-year review of maternal mortality in Chon Buri Hospital, Thailand. J Med Assoc Thai 1993; 76:308-13.
3. Berg CJ. From identification and review to action--maternal mortality review in the United States. Semin Perinatol 2012; 36:7-13.
4. Callaghan WM. Overview of maternal mortality in the United States. Semin Perinatol 2012; 36:2-6.
5. WHO, UNICEF, UNFPA, The World Bank. Trends in maternal mortality: 1990 to 2008. Geneva,World Health Organization, 2010.
6. Deneux-tharaux C, Berg C, Bouvier-colle MH, et al. Underreporting of pregnancy-related mortality in the United States and Europe. Obstet Gynecol 2005; 106:684-92.
7. Horon IL. Underreporting of maternal deaths on death certificates and the magnitude of the problem of maternal mortality. Am J Public Health 2005; 95:478-82.
8. Mackay AP, Berg CJ, Duran C, Chang J, Rosenberg H. An assessment of pregnancy-related mortality in the United States. Paediatr Perinat Epidemiol 2005; 19:206-14.
9. Department of Health.Records management: NHS code

of practice Parts 1.London. Department of Health.2006.

10. King J F,Sullivan EA. Maternal deaths in Australia 2000-2002. Maternal Deaths Series no. 2. Cat. no. PER 32. Sydney, Australian Institute of Health and Welfare National Perinatal Statistics Unit, 2006

11. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. Lancet 2006; 367:1066-74.

12. Sullivan TR, Hirst JE. Reducing maternal mortality: a review of progress and evidence-based strategies to achieve millennium development goal 5. Health Care Women Int. 2011; 32:901-16. Department of Health.

13. "Maternal mortality" Fact sheet No 348. World Health Organization. May 2012. Web. http://www.who.int/mediacentre/factsheets/fs348/en/index.html

14. Murray SF, Pearson SC. Maternity referral systems in developing countries: current knowledge and future research needs. Soc Sci Med 2006; 62:2205-15.

การตายของมารดา และสถานะส่งต่อในโรงพยาบาลชลบุรี: ประสบการณ์ 16 ปี (พ.ศ. 2539-2554)

ธีรภัทร์ จุลละพราหมณ์

วัตถุประสงค์:   เพื่อศึกษาการตายของมารดา สาเหตุการตาย รวมถึง สัดส่วนการตายของมารดา ในโรงพยาบาลชลบุรี รวมถึง ใน กลุ่มย่อยที่เป็นผู้ป่วยส่งต่อมาหรือผู้ป่วยตรงของโรงพยาบาลชลบุรี

วิธีการวิจัย: ศึกษาในมารดาทุกคนที่ตายในโรงพยาบาลชลบุรี ระหว่างมกราคม 2539 ถึง ธันวาคม 2554 เป็นเวลา 16 ปี โดยค้นข้อมูล ทั้งจากคลังข้อมูลของกลุ่มงานและของโรงพยาบาล

ผลการวิจัย: สัดส่วนการตายมารดารวม (รวมผู้ป่วยของโรงพยาบาลและผู้ป่วยส่งต่อ) และเฉพาะของโรงพยาบาลชลบุรี คิดเป็น 52.4 และ 13.4 ต่อทารกเกิดมีชีพหนึ่งแสนราย ตามลำดับ อัตราส่วนมารดาตายรวมไม่เปลี่ยนแปลงจากอัตรามารดาตายระหว่างปี 2525-2534 ที่เคยรายงานมาก่อน อย่างไรก็ดี อัตราส่วนมารดาตายรวมสำหรับมารดาตายทั้งหมด 47 ราย คำนวณแล้วสูงกว่าความเป็นจริง เพราะมีการเพิ่มมารดาตายที่ส่งต่อมาอีก 35 ราย แต่ตัวหารไม่ได้เพิ่มจำนวนทารกคลอดมีชีพที่เหมาะสมจากโรงพยาบาลที่ส่งผู้ป่วยมา 74% ของมารดาตายเป็นผู้ป่วยส่งต่อ 63.8% เป็นมารดาตายตรง สาเหตุการตายมารดารวมสูงสุด ได้แก่ การตกเลือดหลังคลอด ภาวะ น้ำคร่ำอุดตันเส้นเลือดปอด โรคหัวใจ ภาวะครรภ์เป็นพิษ และการแท้งและท้องนอกมดลูก สำหรับการตายมารดาเฉพาะผู้ป่วยโรงพยาบาล ชลบุรี ได้แก่ ภาวะน้ำคร่ำอุดตันเส้นเลือดปอด โรคหัวใจ และภาวะครรภ์เป็นพิษ ส่วนน้อยของมารดาจะถึงโรงพยาบาลแรก (ชลบุรี หรือ โรงพยาบาลที่ทำการส่งต่อ) ในสถานะป่วยหนัก คิดเป็น 8.3% และ 37.1% สำหรับผู้ป่วยโรงพยาบาลชลบุรี และผู้ป่วยส่งต่อ ตามลำดับ ผู้ป่วยส่งต่อส่วนใหญ่คิดเป็น 74.3% มาถึงโรงพยาบาลชลบุรีในภาวะป่วยหนัก โดย 8 ราย (22.9%) ถึงโรงพยาบาลแบบหัวใจหยุดเต้น หรือหลังภาวะหัวใจหยุดเต้น หรือภาวะหนักที่มาก หรือภาวะสมองตาย การตายหลายรายน่าจะป้องกันได้โดยเฉพาะการตายในกลุ่ม การตกเลือดหลังคลอด และการตายเกี่ยวกับการแท้งและท้องนอกมดลูก

สรุป: อัตราส่วนมารดาตายเฉพาะของโรงพยาบาลชลบุรีคิดเป็น 13.4 อยู่ในระดับเดียวกับตัวเลขของประเทศพัฒนาแล้ว ส่วนตัวเลข อัตราส่วนมารดาตายรวมแม้จะคำนวณได้สูงกว่าเป็นจริง ยังอยู่ในระดับของประเทศกำลังพัฒนา ข้อมูลบ่งชี้ว่าการตายมารดาหลายราย น่าจะป้องกันได้