

# CHAPTER I

## INTRODUCTION

### 1. Background and Rationale

Intrapartum or birth asphyxia is a critical problem to address within the context of public health. Each year, globally, it results in a large number of neonatal deaths and neurological disability. In particular, for the developing countries, it has been estimated to account for approximately 3 per cent of infant mortality or 840,000 infants died due to birth asphyxia. It also accounts for 21 per cent of all perinatal mortality (Apichart, 2000:53 and Santit , 1999:57 refers to 2000 Annual Meeting of Perinatal Medical Science Association of Thailand). Birth asphyxia can lead to multi-organ dysfunction. Virtually any organ systems can be affected. The critical systems include central nervous system (CNS), respiratory system, cardiovascular system, blood circulation system, renal, liver, bone marrow and so on ( Kriangsak , 1999). In severe conditions, acute birth asphyxia can result in hypoxic-ischemic encephalopathy (HIE) respiratory failure and disseminated intravascular coagulation (DIC) which aggravate systemic and neurological complications ( Soonthorn, 2000: 57-58) The degree of severity can be classified by the Apgar assessment score, that is, severe asphyxia has a low Apgar score of 0-3 whereas mild and moderate asphyxia has a high persistent Apgar score of 4-7 (Department of Health, 1997).

Birth asphyxia can be occur both in antepartum and intrapartum period. The most likely factors associated with birth asphyxia correlate to the high-risk pregnancy (Bureau of Health Promotion,1999). Maternal factors include high maternal age, multiparty, and anemia disorder, antepartum hemorrhage, toxemia of pregnancy, diabetes and narcotic drug intake. Fetal factor consists of premature birth, intrauterine growth retardation, and infections in pregnancy. The most possible causes of birth asphyxia are intrapartum hemorrhage, postmaturity with meconium aspiration syndrome; pregnancy induced hypertension, prolonged and obstructed delivery and so on. The next factor is intrapartum factor, which includes mal presentation, multiple pregnancy, shoulder dystocia, cephalopelvic disproportion, prolapsed umbilical cord and forceps extraction (Soonthorn, 1997: 34-35).

According to the National Health Development Plan Issue 8 (1997-2001) and Issue 9 (2002-2006), Department of Health , Ministry of Public Health has set the standard indicator for mother and children health care by limiting the incidence of birth asphyxia not greater than 30 per 1,000 live births (Bureau of Health Promotion, 2002). Based on the report concerning the birth asphyxia from 75 provinces all over the country in 1999, it has shown that the incidence of birth asphyxia was 61 per live births which dramatically higher than the target. As a result, Department of Public Prosecution accelerated to take an immediate action in reducing the level of birth asphyxia seriously in November 1999 by a variety of methods. Starting from promoting the idea of creating a better linkage among healthcare personnel at all levels in health care systems to decrease the incidence of birth asphyxia, implementing the information system for birth asphyxia in newborn, encouraging to establish the maternal and

children health care committee, strengthening the skill and knowledge of personnel in maternal and child health care in every province, providing the standard of procedure and manuals for maternal and children health care at all levels in cooperation with Health Promotion Center, Department of Health, implementing the Safe Motherhood Hospital Program to improve the quality of maternal and neonatal care and also decreasing the maternal and neonatal mortality and morbidity rate ( Nipanporn, 2000: 98). After two years , with reference to the report regarding birth asphyxia in 2001, it clearly showed that the incidence of birth asphyxia in newborns dropped to 40.7 per 1,000 live births (Bureau of Health Promotion, 2002).

Maharaj Nakorn Si Thammarat hospital is also in the Safe Motherhood Hospital program which provides the antenatal care service for pregnant women in the area and also serves the pregnant women being referred from other community hospitals both in the province and near by provinces. The statistical record of delivery service for pregnant women in the year 2000, 2001 and 2002 are 5390, 5484 and 5000 cases respectively. The average is 400-450 patients per month and the number of live births is 5416, 5516 and 5028 live births, respectively. The average number of live births is 400-450 cases per month. In 2000, it was recorded that the incidence of birth asphyxia in newborn at 139 per 1000 live births which dramatically higher than the standard indicator, which determined by the Department of Health, 30 per 1000 live births. Therefore, Maharat Nakhon Si Thammarat hospital initiates the cooperation with the provincial health care office and maternal and children health care center in area 11 to provide mutually support for all health care facilities in Nakhon Si Thammarat province to improve their maternal and children health care standard in compliance with the Safe

Motherhood Hospital Policy. To achieve that target, the competency and skill of all responsible personnel in maternal and children health care needs to be strengthened. The competencies include essential antenatal care and maternity care during pregnancy, identification of high risk pregnancy for referral, Partogram using in fetal monitoring, neonatal resuscitation, Apgar score for neonatal initial assessment, obstetrics referral form, and supervision of the operation and solving the maternal and children health problem. In addition, all health care personnel in Maharaj Nakhon Si Thammarat hospital need to set up the standard of procedure in maternal and neonatal care in particular in order to guide their own work. Besides, the new staff, medical student including nurse student will be closely trained and supervised at all time when working at delivery room. Through two year of practice in 2001 and 2002, the incidence of birth asphyxia can be reduced from 139 per 1,000 live births to 115 per 1,000 live births and 89 per 1,000 live births respectively. In 2003, the delivery room had set the target of the incidence of birth asphyxia at 60 per 1,000 live births. To attain this ultimate goal, the management and procedure of maternal and neonatal care service needed to be improved more effectively. Regarding to the records during October 2002 to January 2003, it illustrated that the incidence of birth asphyxia in newborn was significantly higher than targeted. It was about 84.89 per live births. It also indicated that after getting an immediate resuscitation and care at birth, some of asphyxiated newborns had been admitted to the neonatal intensive care unit. This caused a long-term disability or neonatal death, which recognized as the great loss of family.

The researcher, as skilled personnel, responsible for the development of delivery service in delivery room at Maharaj Nakorn Si Thammarat hospital, together with the

other staffs in mother and children health care group strongly agreed that birth asphyxia remained critically problematic at the neonatal care unit. Thus, it was agreed to conduct the case-control study to elucidate the risk factors associated with birth asphyxia at Maharaj Nakhon Si Thammarat hospital in order to devise the optimal solution in reducing the incidence of birth asphyxia. The study process includes review of associated literature and research, analysis of the causes of birth asphyxia from delivery records and determination of the preventive action and contingent plan to solve the problem and improve the working procedure of delivery room.

## **2. Research Questions**

1. What are the risk factors associated with birth asphyxia in newborn infants?
2. How serious is the degree of association of the risk factors, which cause birth asphyxia in newborn infants?

## **3. Objectives**

### **General Objective**

To elucidate the risk factors which associated with birth asphyxia in newborn infants at Maharaj Nakhorn Si Thammarat Hospital

### **Specific objectives:**

1. To examine the risk factors associated with birth asphyxia in newborn infants at Maharaj Nakhorn Si Thammarat Hospital, which include maternal factor, fetal factor, intrapartum factor, maternity care service received factor, antenatal care service provided factor.

2. To ascertain compare the degree of association of each risk factor for birth asphyxia in newborn infants at Maharaj Nakhom Si Thammarat Hospital.
3. To develop the preventive action and contingent plan for solving birth asphyxia problem in newborn infants at Maharat Nakhom Si Thammarat Hospital.

**Assumptions:**

The assessment criterion of birth asphyxia is based on the 1999 criterion of Health Promotion Bureau, Department of Public Prosecution by using the Apgar score at 1 minute. Apgar score of 7 or less, it indicates that the newborn infant suffers birth asphyxia.

#### **4. Operational Definitions**

**Birth Asphyxia** refers to the state or a condition which the live birth has a persistence of Apgar score at 1 minute of 7 or less.

**Newborn** refers to the live birth with more than 28 weeks gestation. In case the gestational age is unknown, it can refer to the live births with weight more than 1,000 grams at delivery room or operation room at Maharaj Nakhon Sri Thammarat hospital.

**Maternal age:** refers to full year of age when mothers giving birth

**Education level** refer to the highest level of mothers' education

**Number of parity** refers to the number of having given all births, regardless of live births or stillbirths.

**Gestational age** refers to the period of gestation counted from the first date of last menstrual period until the delivery date, it is counted by week excluding the fractional days. In case of being unable to remember it, the gestational age will be calculated by the size of uterus or the ultrasound scan.

**Antenatal visit** refers to the minimum of four antenatal appointments with health care personnel. The standard antenatal visit consist of the initial antenatal visit at 0-28 weeks gestation, second is at 28-32 weeks gestation, third is at 32-36 weeks gestation and the last is at 36-40 weeks gestation.

**Diseases or complications in pregnancy** refer to the diseases and complications found during pregnancy; these include anaemia, hypertensive disorder, antenatal haemorrhage, preterm rupture of membrane, diabetes and cardiovascular disease.

**Anemia** refers to hematocrit is less than 33 per cent.

**Hypertensive disorder** refers to high blood pressure with at least 140/90 ml or more when being admitted.

**Antepartum Haemorrhage** refers to bleeding in vagina prior before the start of labor.

**Premature rupture of membrane** is an event that occurs during pregnancy when the sac containing the fetus and the amniotic fluid bursts or develops a hole prior to the start of labor.

**Narcotic intake during perinatal period** refers to 25-50 grams of pethidine intake within 4 hours prior to delivery.

**Oxytocin Induction during perinatal period** refers to Oxytocin mixed with water injected into the vein to induce delivery.

**Fetal presentation** refers to the part of fetal body that first enters the pelvis during perinatal period.

**First stage of delivery** refers to the period of time that from the first true uteri contraction until the cervix has full dilatation.

**Second stage of delivery** refers to the period of the time from full cervix dilatation until the baby passes of the birth canal- the vagina.

**Time of birth** refers to the time period which the expectant mothers give births. It is separated into 3 shifts, that is, day time shift: 08.31-16.30 hr., evening shift: 16.31-00.30 hr., and night shift: 00.31-08.30 hr.



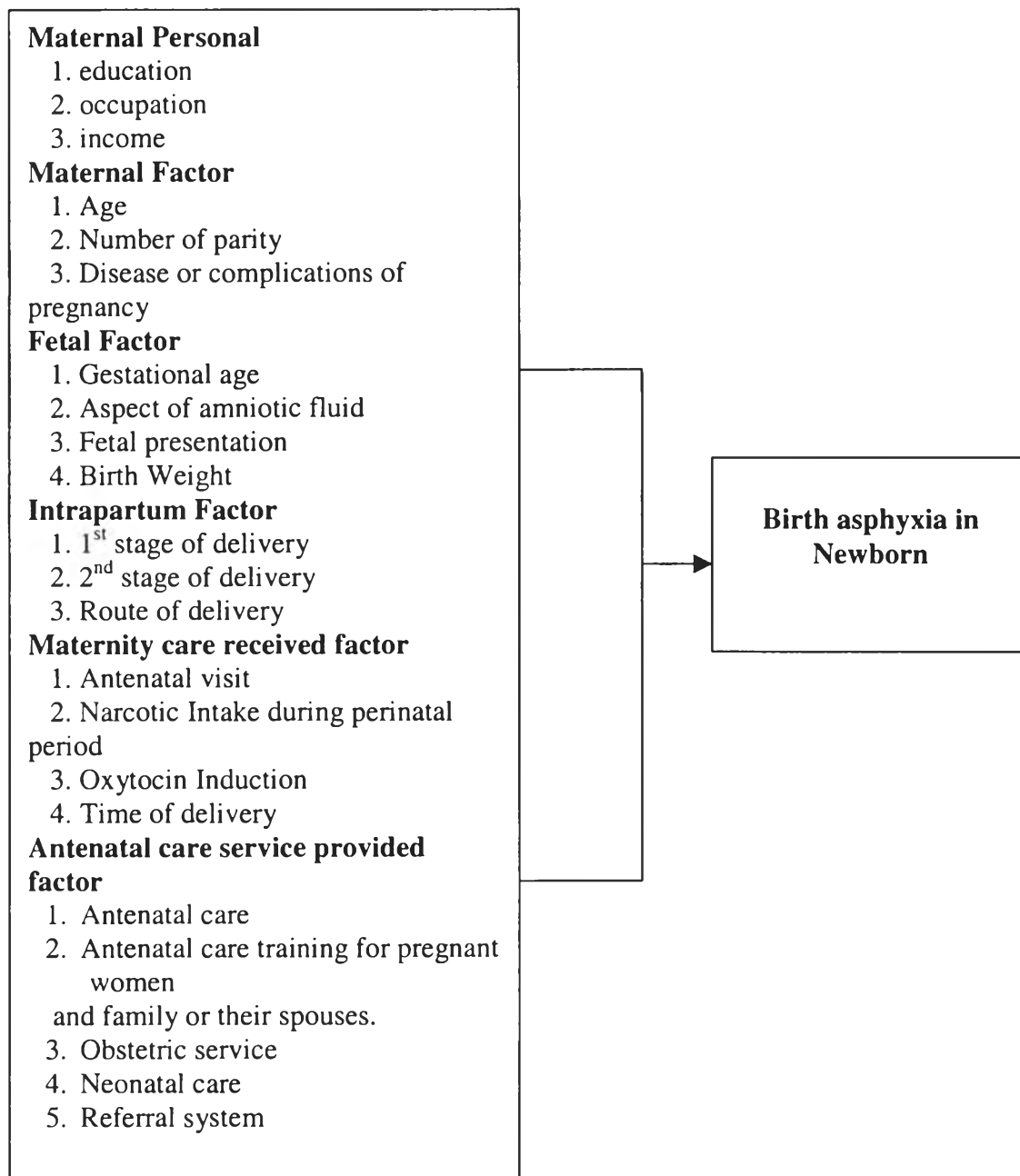
## 5. Research Variables

**Independent variables** include maternal personal data factors: education

Level, occupation, income maternal factors: maternal age, number of parity, diseases and complications of pregnancy, fetal factors: gestational age, aspects of amniotic fluid, birth weight, fetal presentation, intrapartum factors: first stage of delivery, second stage of delivery, route of delivery, maternity care received factors: antenatal visit, narcotic drug intake (petidine), Oxytocin induction, time of birth and antenatal care service provided factors: antenatal care, maternity care training for pregnant women and family or spouses, delivery service, neonatal care and referral system.

**Dependent variable** is presence of birth asphyxia in newborn

## 6. Conceptual Framework



## 7. Expected Benefited Application

The result can be laid to prevent and to solve the problem from the factors found in this study.