

## CHAPTER I



### INTRODUCTION

More than 100 years ago, Oliver Wendell Holmes questioned whether the placenta as an organ of transfer kept pace with the developing fetus or whether it fell behind at some point in time. Just as a definitive answer to the question continues to elude us, so do definitive programs of clinical management for this condition. Problems are presented if one undertakes a policy of routine termination for all pregnancies that go beyond term. Management strategies in vogue today reflect different perceptions of the maternal and fetal risks involved and, we believe, an unfortunate misunderstanding of the pathogenesis of injury in the postdate pregnancy. As the result, prolonged pregnancy has been the subject of numerous studies about the question of damage to the fetus by placental insufficiency. It is obvious that such damage can occur, as every obstetrician, pediatrician, and pathologist know from personal experience. Yet there is a wide divergence of opinion regarding the significance of the risk of prolonged pregnancy and the need to avoid it by terminating the pregnancy. This divergence is partly due to variations in the selection and evaluation of patients,

but also is partly inherent in the ill-defined nature of the condition.

The controversy as to whether postterm infants tend to be "Large for date" or "Small for date" remains unresolved. In 1902, Ballantyne described the postterm infants as excessive in size and the essential problem with delivery as cephalopelvic disproportion (Ballantyne, J.W., 1902). There have been several studies that reported the increased rates of macrosomic infants in pregnancies that progressed past term (Tucker, B.E., 1957; Lucas, W.E., 1965; Zwerdling, M.A., 1967; Arias, F., 1987; Chevenak, J.L., 1989). In contrast, Clifford described the long, thin post term with "The picture of recent weight loss" that he attributed to placental dysfunction, which led to fetal wasting, hypoxia, meconium release, and death. Since this description, there have been additional reports of this "Placental dysfunction syndrome". The current concern of the postterm pregnancy usually relates more to fetal jeopardy from deprivation of oxygen and nutrition than to difficult delivery.

The conflicting opinions about the size of the post term infant, the need for increased surveillance before labor, and the induction of labor has been discussed in the literature but with different conclusions (Browne, J.M.C., 1963; Schneider, J.M., 1978).

Another possibility is that the post term population may include both types of infants (some too big and others too small or too scrawny); If so, population distribution by birth weight must be analyzed and not determined from mean values.

Disturbances of intrauterine growth frequently portend a variety of fetal and neonatal complications capable of inducing physical and intellectual deficits . Intrauterine growth retardation (IUGR) is one of the most common deviations in fetal development and a major problem in contemporary obstetrics. Because of physical and intellectual deficits for development of small for date infants that was proved in a prospective study (Fitzhardinge, P.M., 1972). IUGR broadly refers to suboptimal fetal growth and development occurring secondary to a variety of mechanisms. Regardless of the cause and associated defects, however, these infants are at increased risk for peripartum asphyxia, long-term disability, and perinatal mortality. The growth retarded fetus has a decreased tolerance for hypoxia and is at increased risk for birth asphyxia (Lin, C.C., 1980; Low, J.A., 1981). The fetus grows slower than " normal ", and the result is an infant that weighs less than it should have, called " growth retardation " (Kallen, B., 1988).

Although Intra-Uterine Growth Retardation (IUGR) does not universally presage poor outcome, infants so



affected are at increased risk for a variety of complications, including hypoglycemia, polycythemia, hypocalcemia, and intrapartum asphyxia (Daikoku, N.H., 1979). Perinatal mortality is from 4 to 8 times greater for these infants than non-IUGR infants (Seads, J.W., 1984). During the last three decades, IUGR has been recognized as one of the most important factors affecting perinatal mortality, morbidity, and lifelong sequelae (Advances in obstet. and Gynecol., 1989). In 1967, Zwerdling M.A. published that up to the age of 2 years, the mortality rate of infants of postterm gestations is twice as high as that of babies of term pregnancies (Zerdling, M.A., 1967). Up to now, there is an increasing interest in intrauterine fetal growth retardation (FGR) that some authors suggest the cause derives from placental insufficiency. For any gestational age, as weight decreases below the 10th percentile, the risk of fetal death increases remarkably (Prichard, 1985). That is reason why the criteria of 10th percentile have been usually used as the standard to diagnose the fetal growth retardation.

One of the other deviations of fetal growth is dysmaturity. The Scottish obstetrician Ballantyne (1902) seems to have been the first to call attention to dysmaturity. Until Clifford (1945) reported 46 cases, and to describe the syndrome and its clinical important in detail. He also considers dysmaturity to be caused by a



placental insufficiency and introduces the term "placental dysfunction syndrome". Clifford's reports are of considerable importance because he classified dysmaturity in different stages and because he has made the placental dysfunction syndrome known to pediatricians. It is no doubt that the "Placental dysfunction syndrome" can occur, but there is no evidence that it occurs only or even more frequently in post term pregnancies than it does at or before term. According to Carl J. Pauerstein, dysmaturity occurs approximately 1% of all deliveries, 20 - 30% of post term pregnancies (Pauerstein, C.J., 1987).

Disorders of fetal growth also include fetal growth acceleration. Although often receiving less than attention than their growth-retarded counterparts, pregnancies complicated by fetal macrosomia are subject to a variety of maternal, fetal, and neonatal problems. Fetal macrosomia has been variously defined as a birthweight greater than 4000 Gm. (Modalou, H.D., 1982), 4100 Gm. (Golditch, I.M., 1978) or 4500 Gm. (Parks, D.G., 1978) and greater than the 90th percentile for gestational age. Infants with birth weights in excess of 4000 Gm. are considered to be of excessive size because perinatal mortality increases above this level of birthweight (Battaglia, F.C., 1966); 8 - 10 per cent of infants weigh more than 4000 Gm. at birth (Stevenson, D.K., 1982). Maternal and perinatal morbidity (Sack, R.A., 1969; Nathason, J.N., 1969) and mortality (Yerushlmy, J., 1970) increase in direct relation to

increasing birth weight of the large infant. Pregnancies complicated by macrosomia are more likely to require augmentation of labor with oxytocin than are controls (Modanlou, H.D., 1980). The incidence of cesarean delivery in macrosomia is higher than non-macrosomia, primarily as a result of cephalo-pelvic disproportion and failure to progress of labour. The risk of shoulder dystocia relates directly to increasing birth weight. For fetus weighing more than 4000 Gm., the incidence of shoulder dystocia is reported to range from 1.7 - 8.4 % (Modanlou, H.D., 1982). Excessive fetal size has also been associated with a prolonged second stage of labor and increased postpartum blood loss (Parks, D.G., 1978).

In summary, we would say that postterm pregnancy is one of the most complicated problem in case of fetal outcome and management .

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## State of research problem

According to the publication of Ministry of Health of Vietnam in 1991

Table 1.1 Mortality rate (in 1000 live birth)

	1989	1990
Infant mortality rate	34.3	35.9
Neonatal mortality rate	22.0	22.3
Postneonatal mortality rate	12.3	13.6
Perinatal mortality rate	22.7	27.5

As the publication shows, the mortality is still high and increase a little from 1989 to 1990.

TUDU OB/GYN hospital is one of the biggest OB/GYN in Vietnam. This hospital is the tertiary care hospital for the referred cases from all provinces in the southern Vietnam. According to the reported data of TUDU hospital about the activities in recent years as follow

Table 1.2 Activities of hospital from  
1990 to 1992 (Jan. - Jun.)

	1990	1991	1992 (Jan-Jun)
No. of pregnant women examined	19,014	28,983	15,532
No. of pregnant women delivered	20,848	21,756	10,757
No. of living newborn infant	20,635	21,616	10,789
No. of postterm pregnancy delivered			897

Every year, the hospital has managed a large number of deliveries. Because the prenatal care system is not well enough developed in Vietnam, there are a considerable postterm cases delivered at TUDU hospital. The prevalence of postterm pregnancy at TUDU hospital is about 8.5 per cent. In addition, the aspect of fetal outcomes in postterm pregnancy is still ambiguous, especially in Vietnamese population. The management of postterm pregnancy has not been agreed to obstetricians. With the need to clarify the fetal outcomes of postterm pregnancy, we designed this research in order to contribute to an effectively management strategy for postterm pregnancy. As we known the postterm pregnancy is one of the high risk pregnancy that can cause the neonatal death, postneonatal death as well as perinatal death. Furthermore, the



effectively management strategy would contribute to reduction of fetal mortality rate, neonatal mortality rate and postnatal mortality rate as well as perinatal mortality rate.

### **Key words**

Term pregnancy, Postterm pregnancy (postdate pregnancy, prolonged gestation), Fetal growth retardation (Intrauterine growth retardation, small for date, small for gestational age), Large for date, Placental dysfunction syndrome (Clifford syndrome, Postmaturity, Dysmaturity).

### **Operational definition**

#### **Term pregnancy**

The pregnant women deliver during the 4 weeks period between 38 to the end of 41st. week of gestation. In other words, the pregnant women deliver during 266 days to 293 days.

#### **Postterm pregnancy**

The pregnant women deliver after complete 41 weeks of gestation. In other words, the pregnant women deliver after 293 days of gestation.

### **Early postterm pregnancy**

The pregnant women deliver at 42 weeks of gestation. In other words, the birth occurs during the period between 294 days to 300 days of gestations.

### **Late postterm pregnancy**

The pregnant women deliver at 43rd. week and more. In other words, the birth occurs from 301st day on.

### **Fetal growth retardation**

A newborn infant is classified as growth retarded, or small for gestational age, if the birth weight falls below the 10th percentile for his gestational age.

### **"Large for date" infant**

The infant who have birth weight falls above the 90th percentile for his gestational age.

### **Clifford syndrome**

The newborn infant has the signs based on Clifford classification.

**Low birth weight**

The newborn infant weighs less than or equal to 2500 grams.

**Gestational age**

The length of gestation is calculated by week from the first day of last normal menstrual period to delivery date.

**Research question****Primary question**

Do infants born to postterm pregnancy have greater risk of fetal growth retardation than term pregnancy at TUDU OB/GYN hospital in Hochiminh city - VIETNAM?

**Secondary question**

Do infants born to postterm pregnancy have greater risk of placental dysfunction syndrome than term pregnancy at TUDU hospital?

Do infants born to postterm pregnancy have greater risk of "large for date" than term pregnancy at TUDU hospital in HCM city?



## **Objective**

To find out the association of postterm pregnancy and the unfavorable fetal outcomes that are fetal growth retardation, placental dysfunction syndrome, large for date in order to clarify the effects of the postterm pregnancy on the fetus.

## **The expected benefit**

To contribute to the effectively management strategy of the postterm pregnancy.

To provide the useful information to the obstetricians and pediatricians.

To make a reference for further research.

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