A COMPARATIVE STUDY TO EVALUATE THE ROLE OF DIFFERENT TYPES OF TOCOLYTIC DRUGS IN PREVENTION OF PRETERM LABOUR

THESIS

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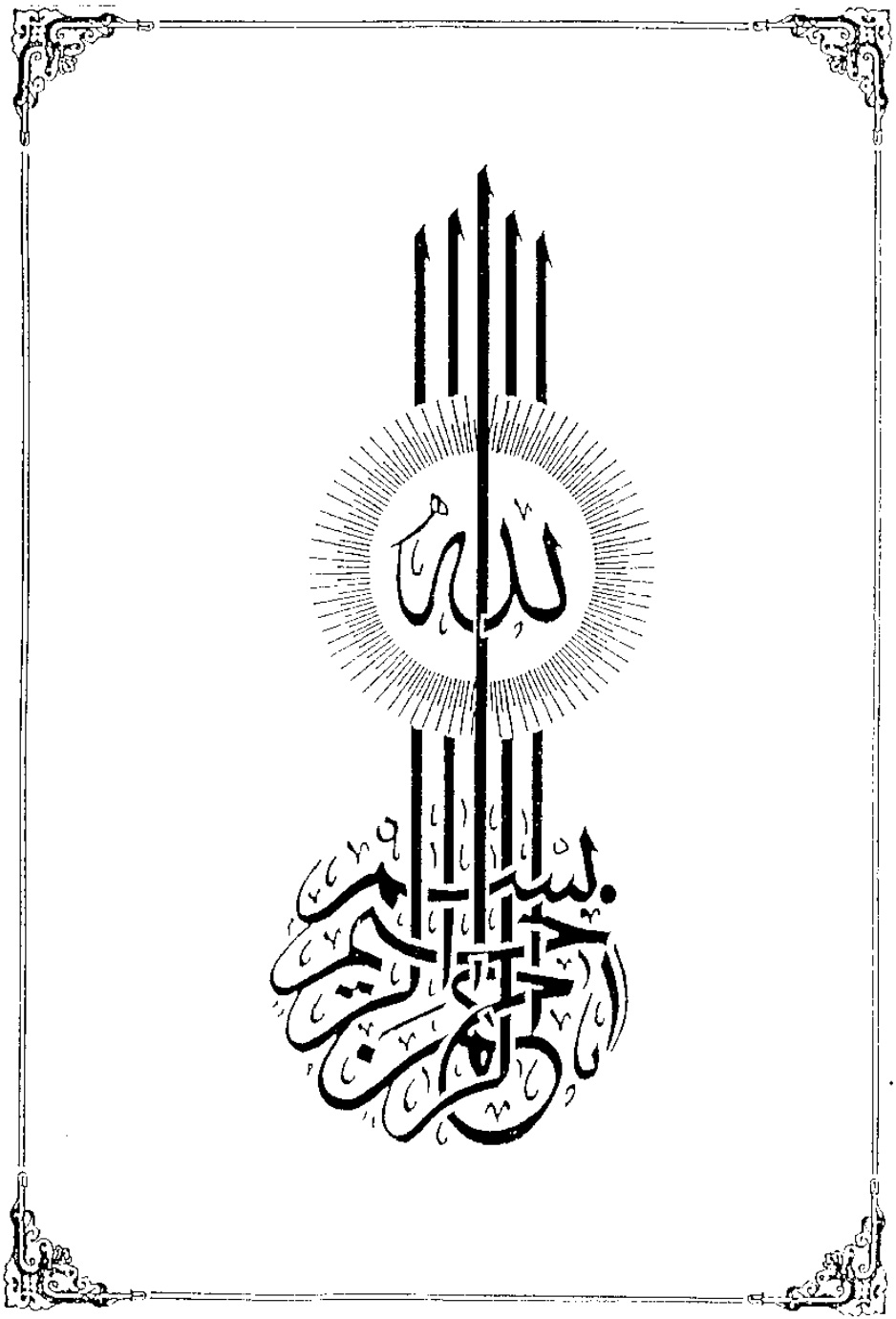

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AIM OF THE WORK

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The aim of this work is to study and compare the effect of different tocolytic agents on inhibition of uterine contractions in case of preterm labour.

INTRODUCTION

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The diagnosis and prevention of preterm labour constitute a major obstetrical challenge. The problem is frequently complicated by our inability to recognize true preterm labour at an early stage and to differentiate it from an episode of uterine contractility which does not lead to expulsion of the fetus.

Preterm labour constitutes 7 to 8% of deliveries in the United States and Europe according to W.H.O. statistics. In Egypt, it constitutes 15.8%.

Preterm delivery is always due to, or mediated by, uterine contractility, so it seems that any means of reducing or preventing such contractility must, of necessity, be beneficial in threatened preterm labour. A wide variety of tocolytic drugs has been used in attempts to suppress uterine contractility, most of which are based on sound physiological principles such as beta-adrenergic agonists, prostaglandin synthetase inhibitors, and magnesium sulphate which were used in this study.

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INTRODUCTION

Advances in Clinical Obstetrics has resulted in significant improvement in the outcome of pregnancy for both, mother and infant. In the first half of this century, efforts were successfully directed at reducing the incidence of maternal mortality, primarily attributable to the sequelae of hemorrhage, infection, and toxaemia. During the last two decades, the focus of attention had been on improving survival of the high risk fetus and neonate through intensive clinical management during the prenatal period, i.e. the prevention of trauma, environmental stress, and asphyxia for both the full term and preterm infant.

More recently the emphasis has begun to shift dramatically in the direction of seeking to assure better pregnancy outcomes through maximizing the health of the pregnant women, and providing a more optimal intra-uterine environment for the developing fetus. It has become clear that further improvements in infant mortality rate will be dependent upon reduction in the incidence of very low birth weight and pre-term births. In most cases, development in uterus to full term gestation provides the fetus with the best chance for survival, and subsequently normal development.[1]

As neonatal mortality correlates closely with prematurity, and those infants who survive premature birth often incur physical and mental impairments for life, certainly the solution to this problem is to prevent preterm birth.[2] The impact of this finding can be best appreciated by the recognition that four of the six leading causes of infant deaths from 1970 to 1978 are almost exclusively associated with the premature neonate.[3]

DEFINITION

Preterm labour is defined as the spontaneous onset of labour 21 days or more prior to term irrespective of birth weight. The term "premature" is best avoided as it has been used in the past to include definitions by weight and/or gestation period, usually comparing all low birth weight babies without seperately identifying those suffering from intra-uterine growth retardation (small for gestational age). Precise classification is ultimately dependent on pediatric assessment, particularly if the gestation period can not be calculated accurately from the menstrual date and supporting evidence, such as ultrasonographic dating which might not be available.[4]

INCIDENCE

The incidence of preterm labour in the United States and in European countries ranges from 6-7% according to WHO statistics.[3] As it correlates greatly with the socio-economic standards of the population, it increases much in the developing countries and those areas of low socio-economic levels.

According to the Egyptian Ministry of Health Statistics, the incidence of prematurity in Egypt reached 15.8% in the year 1985.[5]

PRETERM BIRTH AND PRE-NATAL MORTALITY

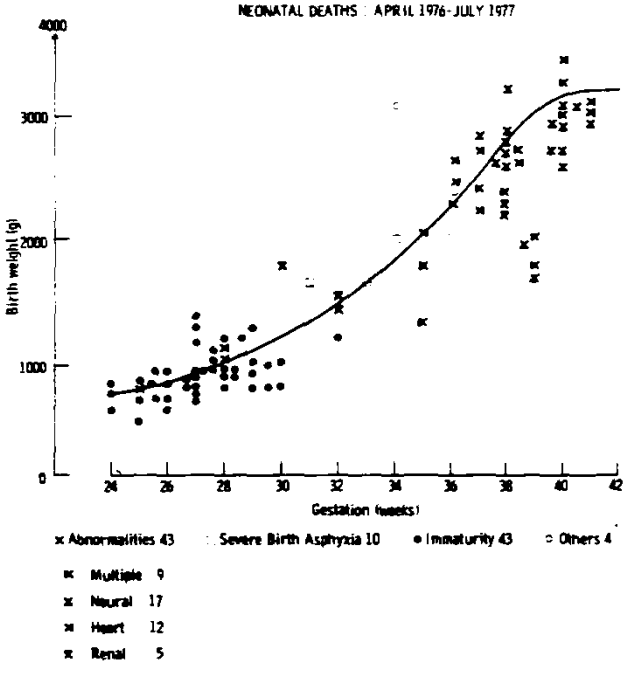
In a study done in Nottingham, the cause of death in the neonatal period (the first four weeks of life) is plotted against the gestational age and birth weight (Fig.1), from which it is found that in 100 consecutive neonatal deaths, 10 were due to neonatal asphyxia, 43 to congenital abnormalities, and 46 due to prematurity. 28 of them were below 28 weeks of gestation and 32 infants were below 1000 gms in weight. As the prenatal mortality comprises neonatal mortality plus deaths in the last trimester, i.e. still births, so fetal deaths in the early part of the last trimester, i.e. from 28 weeks of gestation to 36 weeks of gestation should be included: in Nottingham it is also found that about 40% of still births occur before the 34th week of gestation and 20% were below 1000 gms in weight.(6)

PRETERM DELIVERY AND PRENATAL MORTALITY

The premature infants are more prone to morbid conditions, and the incidence is higher the more premature the infant is.

Morbidity from premature labour:

1- **Intraventricular** hemorrhage (IVH).



The cause of death of 100 infants in the first four weeks of life, plotted according to their estimated gestation and birth weight. The curved line is the approximate mean body weight for Nottingham babies.

FIGURE 1

Hull, 1977.

2- Major mental handicap:
   -Cerebral palsy.
   -Mental retardation.
3- Long-term educational difficulties.
4- Visual handicap.
5- Chronic respiratory problems.
6- Continued impairment of growth.
7- Chronic gestational problems.
8- Re-hospitalization.
9- Difficulties with maternal-neonatal bonding.
10- Increased incidence of non-accidental injuries.
11- Increased incidence of sudden infant death syndrome (Pearce, 1985).

1- Intraventricular Hemorrhage (IVH)

The IVH incidence increases in preterm babies; it also increases as the gestational age decreases. Leven (1982) looked at the factors associated with the development of IVH in preterm infants. Essentially IVH appears to occur when there is a sudden increase in blood flow to the matrix of the ventricles. This causes rupture of the thin walled vessels in the matrix. The increase in blood flow classically occurs when infants become suddenly acidotic. This is more likely to occur if there is already a degree of hypercapnia, as this causes dilatation of the cerebral vessels. Respiratory distress syndrome (RDS), intermittent positive pressure ventelation (IPPV), continuous positive airway pressure (CPAP), hypercapnia, severe acidosis and hyperthermia are all associated with the increase in the incidence of IVH in preterm babies.