

Ain Shams University  
Institute of Post Graduate Childhood Studies

# ABNORMAL IRON DISTRIBUTION IN INFANTS OF DIABETIC MOTHERS

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



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## LIST OF ABBREVIATIONS

AGA	= Appropriate for gestational age
BFU-E	= Burst Forming-Unit-Erythroid
BW	= Birth Weight
CFU-E	= Colony Forming Unit-Erythroid
CNS	= Central nervous system
CS	= Cesarean section
DNA	= Desoxy nucleic acid
EPO	= Erythropoietin
G	= Gram
GA	= Gestational age
GDM	= Gestational diabetes mellitus
Hb	= Hemoglobin
HbA <sub>1</sub> C	= Glycosylated hemoglobin
H,C	= Head circumference.
IDDM	= Insulin dependent diabetes mellitus
IDMs	= Infant of diabetic mothers
IQ	= Intelligence quotient
Kg	= Kilogram
LGA	= Large for gestational age
L/S ratio	= Lecithin/sphengomylin
MAC	= Midarm circumference
mg	= Milligram
mRNA	= Messenger ribonucleic acid
Mu	= Micro unit
ng	= nanogram

NICU = Neonatal intensive care unit.  
NVD = Normal Vaginal Delivery  
RDS = Respiratory distress syndrome  
rHUEP = Recombinant human EPO  
RIAs = Radioimmunoassays  
S.C. = Subcutaneous  
SD = Standard deviation  
TIBC = Total iron binding capacity  
Ug = microgram  
Wks = Weeks  
WHO = World health organization

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# INTRODUCTION

## INTRODUCTION

Pregnancy in a mother with diabetes constitutes a high-risk pregnancy and the infant of the diabetic mother (IDM) is an infant at high risk requiring special observation in the immediate neonatal period (Black, 1991).

In spite of being macrosomic, infant of diabetic mother is considered fragile angle. He is liable to many complications, such as hypoglycemia, hypocalcemia, respiratory distress; Jaundice, polycythemia, renal vein thrombosis and others (Lemons and Vargas, 1981).

Newborn infants at risk for intrauterine hypoxemia or placental vascular insufficiency appear to have reduced iron stores at birth. These groups include infants of diabetic mothers (Chockalingam, et al., 1987).

Amarnath et al., (1989) observed that 90% of infants who are large for gestational age and have hypoglycemia at birth, have reduced serum ferritin and iron concentrations, and 67% have elevated total iron binding capacity.

The degree of serum iron abnormalities in hypoglycemic large for gestational age infants, whether born to diabetic mother or not, has been directly correlated with the degree of fetal macrosomia and neonatal hypoglycemia (Amarnath et al., 1989). This raises the possibility that fetal hyperinsulinemia or hyperglycemia which are directly related to macrosomia and neonatal hypoglycemia, may also be involved in the genesis of the iron abnormalities (Georgieff et al., 1990).

It is possible that placental vascular insufficiency could contribute to abnormal iron distribution in IDMs by reducing maternal fetal iron transfer or by causing fetal hypoxemia. Chronic hypoxemia causes a redistribution of iron from serum and storage pools into an expanding erythrocyte mass (Chockalingam et al., 1987).

Infants of diabetic mothers are often hypoxemic in utero and have a high prevalence of polycythemia at birth. Progressively abnormal iron profiles were associated with higher glycosylated fetal Hb values, greater degree of macrosomia, increased hemoglobin and erythropoietin concentrations (Ruth et al., 1990).

Also, the severity of these iron abnormalities is inversely related to the mother glycemic control during pregnancy (Georgieff et al., 1990).