

# SCORING SYSTEM FOR DIAGNOSIS OF INTRAUTERINE GROWTH RESTRICTION AT SHATBY MATERNITY HOSPITAL

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## Introduction

Intrauterine growth restriction (IUGR) is a common and complex obstetric problem. IUGR is noted to affect approximately 10-15 % of pregnant women. Intrauterine growth restriction (IUGR) is defined as low birth weight infants whose birth weight is lower than the 10<sup>th</sup> percentile for the particular gestational age. Intrauterine growth restriction is a clinical definition and applies to neonates born with clinical features of malnutrition and in-utero growth retardation, irrespective of their birth weight percentile. So, appropriate for gestational age (AGA) infants can be labeled as IUGR if they have features of in-utero growth retardation and malnutrition at the time of birth. Therefore, it is important to keep in mind that neonates with a birth weight less than the 10<sup>th</sup> percentile will be SGA, but not an IUGR if there are no features of malnutrition, and a neonate with a birth weight greater than the 10<sup>th</sup> percentile will be an IUGR in spite of being an AGA, if the infants have features of malnutrition at birth. The postnatal diagnosis of IUGR infant includes clinical examination, anthropometry, Ponderal index, clinical assessment of nutrition (CAN) score, cephalization index, mid-arm circumference, and mid-arm/head circumference ratios.

## Aim of the work

The aim of this work was to study the diagnostic criteria and propose scoring system for diagnosis of intrauterine growth restriction based on prevalence of multiple parameters.

## Patients and Methods

**Patients**  
This study was conducted on 180 pregnant women at Shatby Maternity Hospital with the following criteria: singleton pregnancy, gestational age 28 – 36 weeks at entry of the study based on the exact date of the first day of the last menstrual period, they were followed from the first examination till delivery and then they were subdivided into two groups according to clinical nutritional assessment of neonates at birth:  
**Group I:** 90 cases of appropriate for gestational age fetuses as a control group.  
**Group II:** 90 cases of intrauterine growth restricted fetuses.

**Methods**  
**All patients were subjected to the following:**  
**Complete medical history:** All patients underwent evaluation for the possible causes of IUGR which included maternal history, demographic evaluation and history of previous pregnancies.  
**Detailed Fetal ultrasound examination:** Different fetal biometry parameters including biparietal diameter, head circumference, abdominal circumference, femur length and estimated fetal weight. Doppler study including umbilical artery doppler, middle cerebral artery doppler and cerebro placental ratio. Assessment of amount of liquor by amniotic fluid index.  
**Post natal assessment using the following methods:**  
•Umbilical cord blood gases  
•APGAR score.  
•Complete nutritional assessment according to CAN score  
•Admission to NICU department.

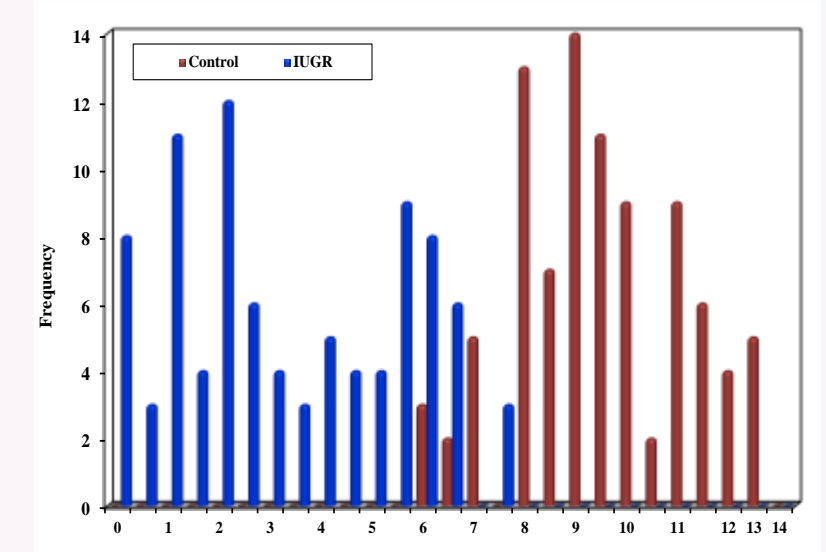
## Results

**Table 1:** Scoring system for IUGR

Score <sup>@</sup>	0	0.5	1	1.5	2	3	4
AC SD	≤-2		>-2: ≤-1		>-1:<0	>0:<1	≥1
HC/AC SD	≥2	<2: ≥1	M	≥-1:<-2	≥-2		
Amount of liquor	Oligo-hydrominos		Normal				
Doppler Umbilical Artery	≥95	≥75:<95	≥25:<75	≥5:<25	<5		
Doppler Middle Cerebral Artery	<5	≥5:<25	≥25:<75	≥75:<95	≥95		
Cerbro placental ratio	<5	≥5:<25	≥25:<75	≥75:<95	≥95		
HTN/PET	Yes		No				

**Table 2:** Validity (AUC, sensitivity, specificity) for score@ to discriminate IUGR patients (n = 90) from control (n = 90)

	AUC	p	95% C.I	Cut off	Sensitivity	Specificity	PPV	NPV
Score <sup>@</sup>	0.992	<0.001*	0.984 – 1.000	≤6.5	96.67	94.44	94.6	96.6



**Figure:** Distribution of IUGR score in our sample

## Conclusion

Intrauterine growth restriction is a postnatal clinical diagnosis according to the presence or absence of features of malnutrition or not regardless of the birth weight percentile. So IUGR score is a good method for combination of multiple parameters which allows for a more accurate diagnosis of IUGR. The result of our study showed that a scoring system composed of 7 different parameters; 1 maternal risk factor and 6 ultrasonographic parameters. The maternal risk factor is hypertension with pregnancy whether preeclampsia or chronic hypetension. Two biometric variables were used which are AC and AC/HC. A third sonographic parameter is amniotic fluid volume which was described as oligohydrominos or normohydrominos. In addition, we used three doppler parameters namely UA PI, MCA PI and CPR. A cut off point at 6.5 was the most appropriate to achieve nearly 95% sensitivity and specificity with lower scores favor IUGR and higher scores favor normality.