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Cansscore – Assessment of Nutritional Status of Newborns

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Summary

Fetal malnutrition is a condition which can be present at any birth weight. The aim of this study was to show that all AGA babies are not always well nourished and all SGA babies are not always malnourished. Two hundred and fifty term babies were assessed using Cansscore – Clinical Assessment of Nutritional Status score. These babies were followed up for first six months of life. 27.9% of AGAs and 22.4% of SGAs were misclassified. All malnourished babies showed catch up growth in the first three months of life and they were more prone to the perinatal complications as compared to well nourished babies irrespective of their status as AGA or SGA.

Introduction

Fetal malnutrition (FM) and the terms Small for Gestational Age (SGA) and Intra Uterine Growth Retardation (IUGR) are not synonymous; one may occur without the other. (Metcoff, 1994) The simplistic classification as AGA or SGA ignores the inherent growth potential of the fetuses such that small well nourished infants may fall into the SGA group and the fetuses originally destined to have much greater birth weights, may fall into AGA or LGA categories despite being smaller than expected.

Fetal malnutrition is a clinical state that may be present at almost any birth weight. As shown in Figure I, if the intrauterine growth of the fetus is monitored, the baby A and B both SGA i.e. they are small as compared to other babies right from the conception. But, here it is expected that both the babies should follow their own percentile. But, baby A shows faltering in the growth and is unable to reach the expected percentile. This baby

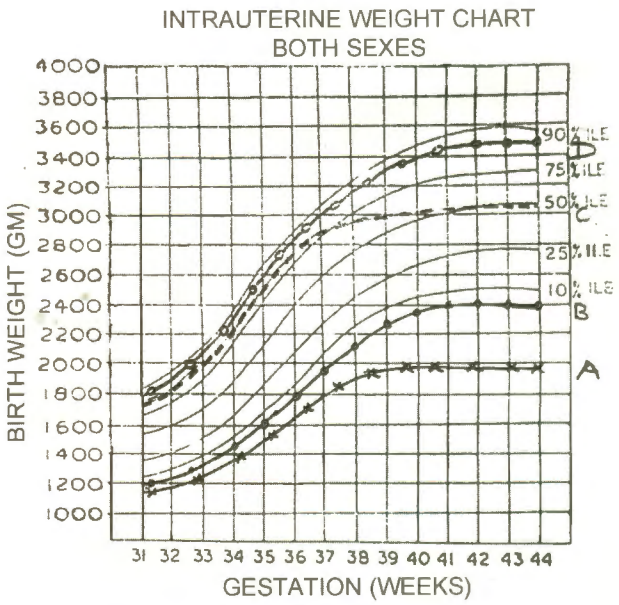

Figure 1: Intrauterine growth curves

is malnourished and is more likely to develop the perinatal complications of growth retardation. While baby B is SGA but is well nourished and is less likely to develop perinatal complications as compared to baby A. Similarly, Baby C has started its growth at 80th centile, but because of some insult during pregnancy fails to reach upto 80th centile at birth and instead falls at 50th centile, which according to the traditional classification, will still be considered as AGA but is actually malnourished and therefore is more likely to suffer from neonatal morbidity as compared to baby D who has grown properly and is well nourished.

Cansscore-Clinical assessment of nutritional status score was developed as a practical, systematic, rapid and easy method to identify term babies with malnutrition, so that they can be closely monitored (Metcoff, 1994).

This study was undertaken with an aim to test the hypothesis that all AGAs are not always well nourished and all SGAs are not always malnourished and to study the morbidity and postnatal growth in fetal malnourished babies.

Subjects and Methods

Two hundred and fifty term babies born in the Department of Obstetrics and Gynaecology, SSGH from March'97 to June'97 were selected randomly for the study. Twins and newborns with major congenital malformations were excluded. All babies were assessed for the gestational age using Meharban Singh's Score (Singh 1991) with an accuracy of +/- 2 weeks. All subjects were weighed naked at birth on a Detecto weighing scale with an accuracy of 20 gms. Repeat weight was done at 24, 48 and 72 hours of life by the same observer. Intrauterine growth curves by Meharban Singh were used to classify the babies as SGA (<10th centile birth weight for gestational age) and AGA (10th to 90th centile of birth weight for gestational age). Cansscore of all the babies was done within 24 hours of birth. Nine superficial, readily detectable signs of malnutrition in the new born were determined by inspection and hands on estimate of loss of subcutaneous tissues and muscle (Figure II) These signs include i) hair ii) buccal fat iii) neck folds iv) arms v) legs vi) chest vii) back viii) abdominal wall ix) buttocks. Each of the sign was rated from 4 (best, no evidence of malnutrition) to 1 (worst, definite evidence of malnutrition in utero). Total score was 36. The newborn was considered to have fetal malnutrition when the score was </=24. All the babies were followed up monthly for first 6 months of life in the Well Baby Clinic and High Risk Clinic. On each follow-up weight was recorded and morbidity if any noted.

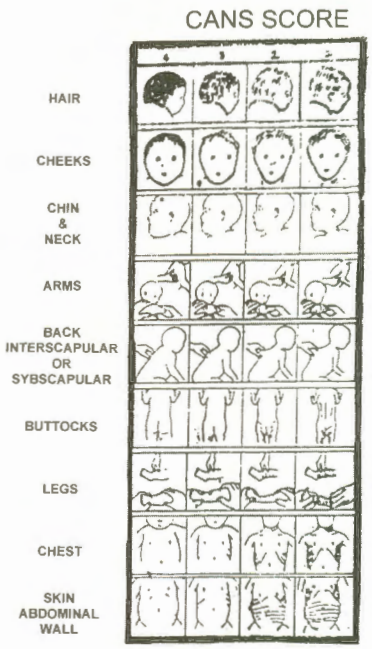

Figure II: Cansscore

Results

Amongst our babies 54.85% were LBW (2.5kg), 75.6% were AGA and 24.4% were SGA. There was not a single LGA baby in our study. As shown in Table-I, CANSCORE divided the babies into two groups well nourished (WN) (60.9%) and fetal malnourished (FM) (39.1%). Twenty seven percent of AGA babies were misclassified i.e. their malnutrition would have been missed if only weight for gestational age was used as a criteria to assess their growth. These babies were

Table I: Relationship of Nutritional status with the various gestational age/weight categories

Category	Well nourished (WN)	Malnourished (FM)	Total
AGA	138 (73%)	51 (27%)	189 (75.6%)
SGA	14 (22.9%)	47 (77.1%)	61 (24.4%)
Total	152 (60.9%)	98 (39.1%)	250(100%)

Table II: Morbidity in various groups

Morbidity	Nutritional Status					
	Malnourished (FM)			Well nourished (WN)		
	AGA n=51	SGA n=47	FM n=98	AGA n=138	SGA n=14	WN n=152
Birth asphyxia	4	6	10 (10.2%)	4	0	4 (2.6%)
Septicemia	2	7	9 (9.1%)	2	0	2 (1.3%)
Hypoglycemia	2	5	7 (7.1%)	1	0	1 (0.6%)
Hyperbilirubinemia	7	10	17 (17.3%)	5	0	5 (3.2%)
IVH	1	13	14 (14.2%)	2	0	2 (1.3%)
MAS	0	0	0 (0%)	1	0	1 (0.6%)
Polycythemia	0	2	2 (2%)	0	0	0 (0%)
Anemia	1	1	2 (2%)	2	0	2 (1.3%)

susceptible to the perinatal complications of IUGR as shown in table-II. Most of the SGAs were malnourished but 22.9% of SGAs were misclassified i.e. they were well nourished. These were the babies who were probably affected in early pregnancy. Also all SGA-WN (n=14) did not have any of the perinatal complications. The results of weight profile at 48-72 hours were not statistically significant but it was clearly evident that a higher percentage of malnourished babies start gaining weight at 48-72 hours as compared to well nourished group irrespective of their initial classification as AGA or SGA. 41.17% of AGA-FM and 48.93% of SGA-FM gained weight at 48-72 hours as compared to 30.43% of AGA-WN and 28.57% of SGA-WN. Malnourished babies showed catch up growth during the first 3 months but later on there was no significant difference in their growth velocity as compared to well nourished babies. Also SGA-WN group did not show any catch up growth.

The results in the present study were comparable to the previous Indian studies but were different from the Western studies probably because of the differences in the various maternal and fetal factors affecting the fetal nutritional status. The two misclassified category viz. AGA (FM) and SGA (WN) were respectively 26.9% and 22.9% which is similar to observations of Mehta et al (1998) of 27.8% and 23.2% respectively.

Discussion

Beattie and Johnson (1994) showed that birth weight alone is a poor indicator of nutritional status of the newborn. Truly malnourished fetuses are at significant risk of the metabolic and other complications of IUGR regardless of their final birth weight classification. Hill et al (1984) found that perinatal problems and/or CNS sequelae occurred primarily in fetally malnourished babies whether AGA or SGA but not in those who were simply SGA but not malnourished. FM indicates a clinical state that may be present at almost any birth weight. FM adversely affects body composition, bones, chemical composition and metabolic as well as enzyme functions. FM is clinically characterized by obvious intrauterine loss of or failure to acquire normal amounts of subcutaneous fat and muscle. Weight, length and head circumference may or may not be affected. CANSCORE was developed as a systematized extension of the observation of Mclean and Usher (1970). Nine superficial readily detectable signs of malnutrition in the newborn are determined by inspection and hands on estimate of subcutaneous tissues and muscle. The traditional classification of babies as AGA, SGA and LGA ignores the inherent growth potential of the babies. CANSCORE helps to identify these malnourished babies irrespective of their classification as SGA r AGA s that these babies can be more carefully monitored for the potential perinatal complications of IUGR.

Conclusion

CANSCORE may be used as a simple clinical index for identifying fetal malnutrition and for the prediction of the neonatal morbidity.

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