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**Original Research Article**

# Study of the prevalence of small for gestational age newborns using clinical assessment of nutritional status of newborn baby at birth (CAN score)

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## ABSTRACT

**Background:** Small for gestational age infants are classically defined as having a birth weight that is more than two standard deviations below the mean or less than the 10th percentile of a population-specific birth weight vs. gestational age plot. IUGR is defined as a rate of fetal growth that is less than normal for the population and for the growth potential of a specific infant. IUGR therefore produces infants who are SGA. The choice of intrauterine growth charts for classification of babies is also not agreed upon. Effect of gender, order of birth, birth weight of previously born babies, maternal factors are also one of the determinants of IUGR in the detection and classification of true Small for gestational age babies. CAN score (clinical assessment of nutritional status at birth in newborn babies), independent of these factors can be used for international comparison of Small for gestational age babies. The objective of the present study was to evaluate the prevalence of Small for Gestational Age newborns using Clinical Assessment of Nutritional status of newborn baby at birth (CAN score).
**Methods:** This study was carried out on 400 consecutive term neonates delivered at the Department of Obstetrics and Gynaecology, Tirunelveli Medical College Hospital, Tirunelveli during June-July 2015. Clinical assessment of nutritional status was done within 48 hours on the basis of the superficial readily detectable signs of malnutrition in the newborn as described by Metcoff. Maximum score of 4 is awarded to each parameter with no evidence of malnutrition and lowest of 1 is awarded to parameter with the worse evidence of malnutrition. Statistics were done using SPSS 16.
**Results:** The study identified 110 (27.5%) babies as IUGR babies using CAN score. This included 56 male babies and 54 female babies. Thus, from the present study, the prevalence of Small for Gestational Age using CAN score was 27.5%.
**Conclusions:** CAN score is the best measure for identifying the IUGR among the neonates.

**Keywords:** CAN score, IUGR, SGA

## INTRODUCTION

Small for gestational age infants are classically defined as having a birth weight that is more than two standard deviations below the mean or less than the 10th percentile of a population-specific birth weight vs. gestational age plot. Broader definitions include less than normal anthropometric indexes, such as length and head circumference, and marked differences between growth parameters, even when they are within the normal range.[1]

IUGR is defined as a rate of fetal growth that is less than normal for the population and for the growth potential of a specific infant.

IUGR therefore produces infants who are SGA.[1] SGA infants can be the result of normal but slower than average rates of fetal growth, such as those constitutionally small but not abnormal infants whose parents, siblings, and more distant relatives are small.[2] SGA infants also can be the result of abnormally slow fetal growth that is caused by pathophysiologic conditions or diseases.

Because growth is one of the essential features of the fetus, nearly any aberration of biologic activity in the fetus can lead to growth failure. Thus, small size at birth can be either a normal outcome or one that is a result of intrinsic or extrinsic factors that limit fetal growth potential.

The choice of intrauterine growth charts for classification of babies is also not agreed upon. Ideally, local growth curves should be obtained from babies of healthy mothers belonging to the high socio-economic group after exclusion of maternal and fetal conditions which are known to affect the growth of the fetus. But in reality, we don't have intra uterine growth charts which can be used as international standards.

There is also draw backs such as effect of gender, order of birth, birth weight of previously born babies, maternal factors which are also one of the determinants of IUGR in the detection and classification of true Small for gestational age babies.

Other indices are also based on the anthropometric variables which are also varies with gender and other factors. While CAN score (clinical assessment of nutritional status at birth in newborn babies) are independent of these factors and can be used for international comparison of Small for gestational age babies. This study is aimed to substantiate this finding.

The objective of the present study was to evaluate the prevalence of Small for Gestational Age newborns using Clinical Assessment of Nutritional status of newborn baby at birth (CAN score).

## METHODS

This study was carried out on 400 consecutive term neonates delivered at the Department of Obstetrics and Gynaecology, Tirunelveli Medical College Hospital, Tirunelveli during June-July 2015.

### *Inclusion criteria*

- Live born, singleton term neonates irrespective of the clinical sick status Informed consent was taken prior to conduct of the study.
- Only infants whose hospital stay exceeded 24 hours of age.
- Known gestational age (New Ballard score, last menstrual period, or obstetrical ultrasound if done)
- No major congenital malformation.

### *Exclusion criteria*

- All preterm
- Babies born with congenital anomalies
- Twins and other multiple gestations
- Babies with cephalhematoma, subgaleal bleed.

Clinical assessment of nutritional status was done within 48 hours on the basis of the superficial readily detectable signs of malnutrition in the newborn as described by Metcoff.[3]

Maximum score of 4 is awarded to each parameter with no evidence of malnutrition and lowest of 1 is awarded to parameter with the worse evidence of malnutrition. The CANSCORE ranges between 9 (lowest) and 36 (highest).

The score consists of nine 'superficial' readily detectable signs of fetal malnutrition. This was based on inspection and hands–on estimates of loss of subcutaneous tissue and muscles. Hairs, Cheeks, Neck and Chin, Arms, Back, Buttock, Legs, Chest and abdomen were examined thus and then scored. Babies with CANSCORE below 25 is regarded as having IUGR.[3]

This score offered the best breakpoint between growth retarded and normal infants as determined by weight for age. Statistics were done using SPSS 16.

## RESULTS

A total of 400 babies were included in the study, of which 209 were male babies and 191 were female babies.

**Table 1: Percentage distribution of mode of delivery according to sexes of babies.**

| Mode of delivery | Male | Female | Significance | Total |
|---|---|---|---|---|
| | No (%) | No (%) | | No (%) |
| Normal | 111 (53.1) | 104 (54.4) | P> 0.05 | 215 (53.8) |
| L.S.C.S | 93 (44.5) | 83 (43.5) | P>0.05 | 176 (44.0) |
| Assisted | 5 (2.4) | 4 (2.1) | P>0.05 | 9 (2.2) |
| Total | 209 (100) | 191 (100) | | 400 (100) |

More than (53.8%) half of the study subjects were delivered normally and 44% of them were delivered by operational delivery. A negligible 2.2% of neonates were delivered with assistance as shown in Table 1.

The birth weight of male babies was significantly greater than the birth weight of female babies as shown in Table 2 (2860.7 ± 447.2 grams as compared to 2730.3±437.6 grams). (p<0.05). The length of male neonates was significantly greater than the length of the female neonates as shown in Table 2 (47.7±1.9 cm as compared to 47.1±1.9 cm). (p<0.05).

**Table 2: Comparison of anthropometric measures between sexes and among the study groups.**

| Anthropometric measures | Male (n = 209) | | Female (n=191) | | Mean difference | 't' | d.f | Significance | Total= A=400 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | mean | S.D. | mean | S.D. | | | | | | |
| Weight (grams) | 2860.7 | 447.2 | 2730.3 | 437.6 | 130.4 | 2.942 | 398 | P<0.01 | 2798.3 | 447.0 |
| Length (cm) | 47.7 | 1.9 | 47.1 | 1.9 | 0.6 | 2.601 | 398 | P<0.05 | 47.4 | 2.0 |

**Table 3: Sex wise percentage distribution of IUGR cases measured by CAN score.**

| Method | Male n = 209 | | Female n = 191 | | Difference of percentage | 't' | d. f | Significance | Total n=400 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | | | | | No | % |
| CAN Score | 56 | 26.8 | 54 | 28.2 | 1.4 | 0.313 | 398 | P>0.05 | 110 | 27.5 |

The study identified 110 (27.5%) babies as IUGR babies using CAN score. This included 56 male babies and 54 female babies as shown in Table 3. Thus, from the present study, the prevalence of Small for Gestational Age using CAN score was 27.5%.

## DISCUSSION

Present study included 400 term babies and on an average female babies were 130 grams lighter, 0.6 cm shorter than male babies. Similarly, in Pam Thomas etal[6]study female babies were 95 grams lighter, 0.6 c.m shorter than male babies.

In our study CAN score identified 27.5 percentage new born babies as IUGR. In Sankhyan N et al study, CAN score detected 27.97 percentage Newborn term babies as IUGR.[7] This was done in Himachal Pradesh, India.

Deodhar et al reported 19.6 percentage of Newborn babies as IUGR as assessed by CAN score.[8] In Adebami OJ et al study conducted in Nigeria 18.8 percentage of Newborn babies were IUGR as detected by CAN score method.[9,10] In Sanjay Mehta et al study conducted in Lady Hardinge Medical College Hospital, New Delhi, the IUGR cases detected by CAN score was 40 percent.

There was no significant difference observed between the two sexes in the assessment of IUGR by CAN score, since the assessment were free from anthropometric indices and maximum proportion of male (26.8%) and female (28.2%) were assessed without any significance.

CAN score identified maximum number of IUGR cases. CAN scoring is not affected by gender, order of birth and other maternal determinants of IUGR. Being it to be American or Indian newborn baby the clinical signs of IUGR as assessed by CAN score is universally applicable. While other indicators like weight for gestational age, ponderal index are affected by gender difference, other determinants of IUGR, CAN score is independent of these drawbacks. Hence CAN score is the best index for detecting IUGR cases and the best index for international comparison of IUGR babies.

## CONCLUSION

CAN score is the best measure for identifying the IUGR among the neonates.

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