



GROWTH PATTERN OF SMALL FOR GESTATIONAL AGE BABIES IN THE FIRST YEAR OF LIFE

Paediatrics

Rahul	Final Year postgraduate at Dept of Pediatrics KVGMCH Sullia DK
Shyam Sundar S	Asso.Professor Dept.of Pediatrics KVGMCH Sullia DK
Pradeep Kumar	Asso.Professor Dept of Pediatrics KVGMCH Sullia DK
Amrita Koti*	Asst.Professor Dept of Pediatrics KVGMCH Sullia DK *Corresponding Author

ABSTRACT

Objective: To compare growth pattern of preterm, term and post term SGA babies in first year of life. **Design:** 1 year follow up Prospective study **Method:** As per inclusion criteria 70 cases (SGA) were selected for the study were enrolled by Universal Sampling technique. These SGA babies were categorized into three groups based on birth weight. Babies in each sub group were entering a follow-up programme that includes measurement of anthropometric Parameters (weight, length and head circumference) At 1.5,2.5,3.5 months, at 9 and 12 months. **Results & Conclusion:** In comparison to weight patterns of Preterm, Term and Post term SGA babies, Preterm SGA babies had almost similar rate of weight gain pattern but failed to reach the catch up weight of Post term and Term SGA Babies. Maximum weight gain at 12 months seen by Post term SGA babies and minimum by Preterm SGA babies. Term SGA babies had maximum mean length by the end of first year compared to Post term and Preterm SGA babies. Maximum mean Head circumference was shown by Post term SGA babies at 12 months of age in comparison with Preterm and Term SGA babies.

KEYWORDS

SGA, Growth pattern, Followup Prospective

INTRODUCTION

Newborns are classified into Appropriate for gestational age (AGA), Small for gestational age (SGA) and Large for gestational age (LGA) based on weight and gestational age. SGA babies can be term, Preterm or post term. The most common cause is still unknown but Maternal/Foetal Nutritional deficiencies, Chemical agents, Genetic and Chromosomal abnormalities play an important role.¹

SGA babies are at high risk for short stature, poor academic performance and behavioural problems². Majority of SGA babies catchup growth within 1-2 years of life but some of them remain with short stature while some of studies show that catchup growth increases adiposity and persists beyond catchup.³ IUGR or being SGA has a life long impact on fetus potential for development and survival.^{4,5} There are certain complications associated with SGA /IUGR babies which include congenital anomalies, perinatal depression, meconium aspiration, pulmonary hemorrhage, persistent pulmonary hypertension of newborn, hypotension, hypoglycemia from depletion of glycogen stores, hypocalcemia, polycythemia, neutropenia, thrombocytopenia, dyslipidemia and acute tubular necrosis/renal insufficiency. SGA infants have higher than average risk of morbidity and mortality from many neonatal disorders.⁶⁻⁸

Aims and Objectives of the study

- To compare growth pattern of preterm, term and post term SGA babies in first year of life.

MATERIAL AND METHODS:

Study design- Follow up, Prospective study

Sample size -70 SGA babies delivered at KVGMCH Sullia during the data collection period.

Sampling technique – Universal sampling.

Method of data collection -

At the time of the study informed consent taken will be taken from the parents. Collected data will be entered into a proforma that has been prepared for the study. Anthropometric parameters will be measured at birth, on discharge and subsequently at 6 weeks, 10 weeks, 14 weeks, 9 months and 1 year of age. These periods were selected to coincide with the vaccination schedule to ensure better follow-up. Physical parameters being measured:

Weight will be measured by an electronic weighing machine at birth and also for further during the follow up period, baby will be weighed naked or with minimal clothing after ensuring the zero reading on the weighing machine.

Length will be measured by taking crown heel length on an Infantometer ..

Head circumference:

It is measured by a non-stretchable measuring tape. It is measured by placing the tape over the occipital protuberance at the back and just over the supraorbital ridge and glabella. All data will be tabulated.

RESULTS AND ANALYSIS

Table 1: Comparison Of Weight With Term, Preterm And Post Term

Age in Months	Post term(n=7)	Pre term(n=19)	Term(n=44)	F-test	P-value
Birth	2.37±0.048	1.3±0.25	2.05±0.251	64.69	<0.001
1.5 months	2.8±0.49	1.6±0.40	2.70±0.44	43.34	<0.001
2.5 months	3.55±0.64	2.38±0.73	3.50±0.57	22.43	<0.001
3.5 months	4.38±0.71	3.13±0.89	4.31±0.68	17.53	<0.001
9 months	7.42±0.89	6.3±0.94	7.36±0.91	8.73	<0.001
12 months	8.4±0.1.3	7.19±0.88	8.20±0.90	8.43	<0.001

Table 2: Comparison Of Length With Term, Preterm And Post Term

Age in Months	Post term(n=7)	Pre term(n=19)	Term(n=44)	F-test	P-value
Birth	44.95±1.76	41.06±3.39	46.13±2.36	28.49	<0.001
1.5 months	48.32±2.15	44.70±2.9	49.55±2.71	24.64	<0.001
2.5 months	51.71±1.97	48.15±3.36	52.76±2.76	19.86	<0.001
3.5 months	55.38±2.70	51.78±3.9	56.34±3.13	15.15	<0.001
9 months	67.16±3.03	66±2.84	68.36±3.03	4.18	<0.001
12 months	71.6±2.99	70.71±2.9	72.5±2.79	3.30	<0.001

Table3: Comparison Of Head Circumference With Term, Preterm And Post Term

Age in Months	Post term(n=7)	Pre term(n=19)	Term(n=44)	F-test	P-value
Birth	32.85±1.10	29.0±2.02	32.15±1.53	27.49	<0.001
1.5 months	34.57±0.97	30.60±2.48	34.37±1.46	31.9	<0.001
2.5 months	36.14±1.21	33.02±2.33	36.11±1.47	22.01	<0.001
3.5 months	38.35±1.24	35.05±2.52	38.17±1.68	19.24	<0.001
9 months	43.4±0.97	41.60±1.56	43.40±1.26	12.74	<0.001
12 months	45.42±1.61	43.55±1.48	45.41±1.19	13.86	<0.001

DISCUSSION

For any follow up Prospective study, a good follow-up is extremely important. Parents of the babies were well motivated at the time of discharge from our hospital. Reminders were sent as and when

required. In spite of this we had 15 dropouts in the cases. Babies with VLBW (<1500gm) followed-up regularly without needing any reminders when compared to babies (>1500gm) who needed frequent reminders. Mothers of VLBW (<1500gm) were more concerned about their babies. The main attitude of the mothers of babies with weight > 1500gm was that as long as their baby is fine, they don't need any follow-up. When we tried to analyze the difficulties they had in monthly follow-up, it was found that cost factors, domestic responsibility, inconvenient timings of the clinic do not permit them to follow-up at regular intervals. Many factors related to SGA birth have been identified. These include foetal, maternal, uteroplacental, and demographic factors. Demographic factors; Groupings can be made such as maternal age too advanced or too young, mother's weight and height, born of mothers with low birth weight, nulliparity or grand multiparity, mother's inability to gain enough weight during pregnancy, maternal history of a baby with SGA before. Chronic diseases in the mother, placental, uterine and cervical anomalies are other risk factors for the development of a baby with SGA. No chronic disease, placental, uterine and cervical anomalies were found in the mothers of the babies with SGA who participated in our study. Smoking and alcohol consumption of the mother are also important risk factors. None of the mothers consumed alcohol and smoked during their pregnancy in our study.

In our study we had enrolled 70 SGA babies delivered in our hospital. Among those 57.1% and 42.9% were males and females respectively. We decided the 70 SGA babies into 3 groups based on birth weight <1.5kg, 1.5 to 2kgs and 2.1 to 2.5 kg as group 1, 2 and 3 respectively. Among those 70 SGA babies we had 27.1%, 62.9% and 10% Preterm, Term and Postterm SGA babies respectively. Among the study subject mean and S.D birth weight of babies was 1.9+-0.4. Maximum and minimum birth weight of babies 2.4 kg and 1kg respectively.

Bhargava V⁹ did a study on growth pattern in babies of extreme low birth weight for 2 years. Their sample size included 32 babies. 17 were premature (>1,600 gm) and 15 were term SGA babies (>1,600 gm). They found that premature SGA babies, though initially had a slight handicap compare to the term small for date babies, gradually catch up later by 6 to 9 months and then over take them in all the three parameters i.e. Weight, length and head circumference. Similarly like Bhargava study, in our study Preterm small for gestational age babies had a slight handicap compare to term SGA babies, gradually catchup later by 9 months of age in all three parameters i.e. Weight, length and head circumference. (Table no.4,5 and 6).

CONCLUSIONS

In comparison to weight patterns of preterm, term and postterm SGA babies, preterm SGA babies had almost similar rate of weight gain pattern but failed to reach the catch up weight of postterm and term SGA Babies. Maximum weight gain at 12 months seen by postterm SGA babies and minimum by Preterm SGA babies. Term SGA babies had maximum mean length by the end of first year compared to Postterm and preterm SGA babies. Maximum mean Head circumference was shown by Postterm SGA babies at 12 months of age in comparison with preterm and term SGA babies.

Future Scope :

We need more sample size for better comparison of growth pattern of Preterm, Term and Post term SGA babies. Study should be multi centric. Along with monitoring for Anthropometric parameters, we can also assess development of the child and Immunization status.

REFERENCES:

1. Ugwu, R.O., & Eneh, A.U. (2010). The Proportion Of Low Birth Weight Babies Due To Small For Gestational Age (Sga) And Prematurity In Port Harcourt, South-South Nigeria - Changing Trends. *The Internet journal of pediatrics and neonatology*, 13.
2. Ramji, S., Marwah, J., Satyanarayana, L., Kapani, V., Mohan, M., & Bhargava, S.K. (1986). Neonatal thigh circumference as an alternative indicator of low birth weight. *The Indian journal of medical research*, 83, 653-4.
3. Saenger, P., Czernichow, P., Hughes, I.A., & Reiter, E.O. (2007). Small for gestational age: short stature and beyond. *Endocrine reviews*, 28 2, 219-51.
4. Barker, D.J. (1993). The intrauterine origins of cardiovascular disease. *Acta Paediatrica*, 82.
5. Gluckman, P.D., Harding, J.E., Oliver, M.H., Liu, L.J., Ambler, G.R., Klempt, M., & Breier, B.H. (1993). Mechanisms of Intrauterine Growth Retardation: Role of Fetal and Maternal Hormones.
6. Fitzhardinge, P.M., & Steven, E.M. (1972). The small-for-date infant. II. Neurological and intellectual sequelae. *Pediatrics*, 50 1, 50-7.
7. Wennergren, M., Wennergren, G., & Vilbergsson, G. (1988). Obstetric Characteristics and Neonatal Performance in a Four-Year Small for Gestational Age Population. *Obstetrics & Gynecology*, 72, 615-620.
8. Low, J.A., Galbraith, R.S., Muir, D.W., Killen, H.L., Pater, E.A., & Karchmar, E.J. (1985). The relationship between perinatal hypoxia and newborn encephalopathy.

American journal of obstetrics and gynecology, 152 3, 256-60.

9. Bhargava, S.K., Bhargava, V.L., Taneja, S., & Ghosh, S. (1971). Birth weight, gestational age and growth pattern in babies with a birth weight of 2000 grams or less. *Indian pediatrics*, 8 11, 736-51