Original Research Paper

Volume - 11 | Issue - 04 | April - 2021 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Pediatrics

"STUDY OF HIGH RISK INFANTS AND NORMAL INFANTS FOR GROWTH ASSESSMENT"

Dr.Sheenu Gupta	Consulting Pediatrician, NaviMumbai, Maharashtra.India.
Dr.Vijay Baburao Sonawane*	Associate Professor, Department Of Pediatrics, D. Y. Patil University , School of Medicine ,Nerul , Maharashtra.India. *Corresponding Author
Dr.Veeranna Kotrashetti	Professor, and Head of Unit, Department Of Pediatrics, D. Y. Patil University , School of Medicine ,Nerul , Maharashtra.India.
Dr. Prashant Abusaria	Resident(PG) Department Of Pediatrics, D. Y. Patil University ,School of Medicine ,Nerul , Maharashtra.India.

ABSTRACT **Background :** Neonates at risk should be identified as early as possible prenatally or after birth to decrease neonatal morbidity and mortality. There is a common perception that high-risk follow up mainly concerns with detection and management of neurosensory disability. In fact, growth failure and ongoing illnesses are equally, if not more important issues in high-risk follow-up. Adequate emphasis must be placed on these also. **Aim & Objectives:** 1) To study growth of high-risk infants and normal infants 2) Early detection of growth failures and delays **Material & Methods:** A hospital-based Prospective observational study. A total of 30 high-risk neonates were included as "Cases" while 30 newborns as controls without any high risk factor. On follow up, growth assessment was done by calculating anthropometric parameters . Data was analysed using statistical software SPSS ver. 21. **Results:** Overall 33 newborns were females (55%) and 27 were males (45%) (p-1.0). All the controls were term babies while in study group ,16 (53.3%) cases were premature cases while 4 (13.3%) were post term . Out of the total 30 cases with risk factors, 25 were low birth weight. Mean gestation age and birth weight was significantly less in cases as compared to controls ($p<0.05$). On follow up, a total of 2 cases (6.7%) had microcephaly i.e. head circumference below 3 standard deviation and total of 4 (13.4 %) infants had stature i.e.length below 2 standard deviation. **Conclusion:** Incidence of growth delay among high-risk newborns is significantly high with low birth weight and preterm being the most common etiology . Most growth delays go undetected in the early years of life. Improved perinatal care, early detection, and early intervention at the grass-root level will bring down incidence of growth delay in this vulnerable group.

KEYWORDS : High Risk Infants, Preterm Babies, Low Birth Infants ,Growth Delay, Microcephaly.

INTRODUCTION

Neonates at risk should be identified as early as possible prenatally or after birth to decrease neonatal morbidity and mortality. Approximately 9% of all births require special or neonatal intensive care [1].Even though there has been a substantial improvement in neonatal survival, the incidence of chronic morbidities and adverse outcome in survivors continues to be high.[2-5]

This highlights the need for a follow-up care service that would ensure systematic monitoring of the general growth after discharge from the hospital. In fact, growth failure and ongoing illnesses are equally, if not more important issues in high-risk follow-up. Adequate emphasis must be placed on these.These anthropometric parameters will help us to understand the possible deviation in normal course of growth of high-risk infants and early intervention if any signs of growth disorder is present[6-11].

Aim And Objectives

1)To study growth status of high-risk infants and normal infants
2)Early detection of growth failures and delays in high-risk infants

MATERIAL AND METHODS

Study Design: A Prospective, Observational,Hospital Based Study

Sample Size:

A total of 30 high-risk neonates were included in the study as "Cases". A similar number of controls were also taken without any risk factor.

Study Duration : 1 year

Inclusion Criteria:

1. Preterms
2. Asphyxia
3. Sepsis
4. Seizures
5. Respiratory Distress, Meconium Aspiration Syndrome And Apnea
6. Low birth weight

EXCLUSION CRITERIA:

1. Hemodyanamically Unstable newborn
2. Lost To Follow Up .

METHODOLOGY :

Institutional Ethical committee approval was taken and after written Informed Consent from the parents or the guardians of the newborns satisfying the inclusion criteria, prenatal and postnatal risk factors were assessed among study participants.

Growth Assessment:

It was done by using anthropometric parameters, such as Length, Weight and Head Circumference etc.

1. Weight: Measured on electronic weighing scale accurate to ± 10 gram, with baby being unclothed
2. Length: Measured in centimetres with an infantometer. The infant should be held supine and legs fully extended. The feet should be pressed against the movable foot piece with the ankles fixed to 90˚.
3. Head Circumference: The occipitofrontal diameter was taken using flexible tape passing over occipital protuberance posteriorly and supraorbital ridges anteriorly.
4. Growth (including weight, head circumference, mid-arm circumference and length) should be monitored and plotted on an appropriate growth chart at each visit. We use Wright's charts (till 40 weeks PMA) and WHO growth charts (for preterm infants after 40 weeks PMA and for term infants) for growth monitoring. The infant's growth pattern (slope of the curve) is compared with the standard curve; any deviation should be noted and appropriate remedial action taken.
5. Subsequently, measurements were repeated at discharge and then at 6, 10, 14 weeks and 6 months of age. At follow up, growth and developmental assessment was done by calculating anthropometry.

STATISTICAL ANALYSIS :

The quantitative data was represented as their mean ± SD. Categorical and nominal data was expressed in percentage. The t-test was used for analysing quantitative data, or else non-parametric data was analysed by Mann Whitney test and categorical data was analysed by using chi-square test. The significance threshold of p-value was set at <0.05. All

analysis was carried out by using SPSS software version 21.

RESULTS:

A total of 30 high-risk neonates were included in the study as "Cases". A similar number of controls were also taken, without any risk factor.Overall 33 newborns were females (55%) and 27 were males (45%) with no difference between study groups (p-1.0).

Table 1: Distribution Of Cases As Per Gestation Age

Gestation Age	Group		Total
	Cases	Controls	
Preterm	16	0	16
	53.3%	0.0%	26.7%
Term	9	30	39
	30.0%	100.0%	65.0%
Post Term	4	0	4
	13.3%	0.0%	6.7%
Total	30	30	60
	100.0%	100.0%	100.0%
p- value <0.01			

All the controls were term babies while , 16 (53.3%) cases were preterm cases while 4 (13.3%) cases were post-term .

Table 2: Distribution Of Cases As Per Birth Weight

Birth Weight	Group		Total
	Cases	Controls	
Normal	5	30	35
	16.7%	100.0%	58.3%
Low	16	0	16
	53.3%	0.0%	26.7%
Very Low	9	0	9
	30.0%	0.0%	15.0%
Total	30	30	60
	100.0%	100.0%	100.0%
p- value <0.01			

All the controls have weight as normal while 25 (83.3%) cases have LBW. Out of these 25 cases, 9 (30%) had VLBW .

Table 3 : Comparison Of Mean Gestation Age And Birth Weight

Variables	Group	N	Mean	SD	p- value
Gestation Age	Cases	30	36.54	3.98	<0.05
	Controls	30	39.77	2.01	
Birth Weight	Cases	30	2.19	0.54	<0.05
	Controls	30	2.87	0.48	

Mean Gestation Age And Birth Weight was significantly low in cases as compared to controls (p<0.05).

Table 4: Distribution Of Cases As Per Head Circumference

Head circumference < 3 S.D	Group		Total
	Cases	Controls	
Yes	2	0	2
	6.7%	0.0%	3.3%
No	28	30	58
	93.3%	100.0%	96.7%
Total	30	30	60
	100.0%	100.0%	100.0%
P- value - 0.49			

On follow up, a total of 2 cases (6.7%) had head circumference below 3 S.D (P- value - 0.49)

Table 5. Distribution Of Cases As Per Length

Length below 2 S.D.	Group		Total
	Cases	Controls	
Yes	4	0	4
	13.4	0.0%	13.4%
No	26	30	56
	86.6 %	100.0%	86.6%
Total	30	30	60
	100.0%	100.0%	100.0%

At follow up, a total of 4 cases (13.4%) had length below 2 S.D.

DISCUSSION:

In present study, overall 33 newborns were females (55%) and 27 were males (45%) with no statistical difference in study groups (p=1).Total 16 (53.3%) cases were preterm while 4 (13.3%) cases were post term. All the controls have weight as normal, while 25 (83.3%) cases have LBW. Out of these 25 cases, 9 (30%) had VLBWC (p- value <0.01). Mean Gestation Age And Birth Weight was significantly low in cases as compared to controls (p<0.05). At follow up, a total of 2 cases (6.7%) had head circumference below 3 S.D (P value - 0.49) also, a total of 4 cases (13.4%) Newborn had length below 2 S.D.

Chaudhari S et al [5] aimed to study the mortality and morbidity in high-risk infants after discharge from the hospital. There was a significant difference (p <0.001) in the mortality rate between the group which attended the HRC regularly (6.4%) as compared to that of the defaulters (27.6%). In contrarst ,present study observed no mortality. Juneja M et al [12]aimed to evaluate the growth status of term infants weighing 2000 g or less at 18 months and concluded that term LBW infants are at a significant disadvantage in terms of growth. This observation is similar to our study .

Sass et al [13] aimed to monitor the growth of high-risk babies in the first year of life and concluded that evaluation of growth in at-risk infants should include a multidimensional analysis, which is emphasized in present study .

Sudhir U et al [14]aimed to study the outcome of growth and development till one year of age of very preterm neonates and moderate to late preterm admitted and discharged from a tertiary level NICU in central India. Overall growth (all the anthropometric parameters) was higher in the moderate to late preterm group (p<0.05) which is similar to our study.

REFERENCES

1. Carlo WA. The high-risk infant. Nelson textbook of pediatrics. 19th ed. Philadelphia, PA: Saunders. 2011;552.
2. Ho LY. Follow-up Care and Outcome Evaluation of High-Risk Preterm Infants: A Life-Course Commitment. 2018; 47(2): 551-56.
3. Escobar G, Littenberg B, Petitti DB Outcome among surviving very low birth weight infants: a metaanalysis. Arch Dis Child Feb1991; 66: 204 - 211.
4. Saigal S, Doyle LW. An overview of mortality and sequelae of preterm birth from infancy to adulthood. The Lancet. 2008 Jan 19;371(9608):261-9.
5. Chaudhari S, Kulkarni S, Barve S, Pandit AN, Sonak U, Sarpotdar N. Neurologic sequelae in high risk infants--a three year follow up. Indian Pediatr. 1996 Aug;33(8):645-53.
6. Paul VK, Radhika S, Deorari AK, Singh M. Neurodevelopmental outcome of 'at risk' nursery graduates. Indian J Pediatr. 1998 Nov-Dec;65(6):857-62. [PubMed]
7. Sukumaran TU, Vijesh PV, Sukumaran PS. Developmental delay and disabilities in high risk newborns- a follow up study. Journal of Rehabilitation Council of India 2008 Jan-Dec;4(1&2):18-24.
8. Baburaj S, Abraham B, Vasant PV, Raj S et al. Growth and development till one year from a rural neonatal intensive care unit in south India. Int J Biomed Reseach 2013;4(12):695-700.
9. Luo YF, Zheng K, Zhou XJ, Liang JF. Mental development of high-risk neonates:a long-term follow-up study. World J Pediatr 2006 May 15;2:121-124.
10. Molteno CD, Thompson MC, Buccimazza SS, Magasiner V, Hann FM. Evaluation of the infant at risk for neurodevelopmental disability. S Afr Med J. 1999 Oct;89(10):1084-7.
11. Lantos JD, Meadow WL. Neonatal Ethics: The Moral Challenges of Modern Innovation. Baltimore, Maryland: The Johns Hopkins University Press; 2006
12. Juneja M, Shankar A, Ramji S. Neurodevelopmental, functional and growth status of term low birth weight infants at eighteen months. Indian pediatrics. 2005 Nov 1;42(11):1134.
13. Sassá AH, Higarashi IH, Bercini LO, Arruda DC, Marcon SS. At-risk infants: monitoring children's growth in the first year of life. Acta Paulista de Enfermagem. 2011;24(4):541-9.
14. Sudhir U, Ghanghoriya P, Barman M, Joshi T. Growth and neurodevelopmental outcome of high risk premature neonates at 1 year in a tertiary level NICU of central India. Int J Contemp Pediatr 2017;4:1787-91.