

A STUDY ON FOLLOWUP OF LOW BIRTH WEIGHT BABIES ON EXCLUSIVE BREAST FEEDING UPTO FOUR MONTHS OF AGE

Srinivasa Sharanappa¹, Reshmavathi Venkatram²

¹Professor and HOD, Department of Paediatrics, Kempegowda Institute of Medical Sciences and Research Hospital.

²Junior Resident, Department of Paediatrics, Kempegowda Institute of Medical Sciences and Research Hospital.

ABSTRACT

BACKGROUND

Birth weight of a child is an important indicator of its vulnerability for childhood illness and chances of survival. A significant number of infant deaths can be averted by prevention of factors associated with LBW and adequate management of LBW babies. The incidence of low birth weight baby continues to be high in developing countries in contrast to developed countries.

METHODOLOGY

It was a prospective study conducted between October 2014 and September 2015. All babies delivered with a birth weight less than 2500 grams were included in the study. Detailed records were made regarding maternal history and new-born examination. Advantage of exclusive breast feeding explained to parents and advised to attend the Well Baby Clinic on Wednesdays at monthly intervals for first four months. During each visit growth parameters were measured, developmental milestones assessed. General physical examination and neurological examination done. Data analysed by Chi-square test and ANOVA test.

RESULTS

21.4% of LBW babies were >2000 grams, 41.4% between 1500-2000 grams and the remaining <1500 grams were 37.2%. There was a significant association between head circumference, length and their gestational age. Among complication associated with neonates 74.4% cases were uncomplicated, 14.3% cases had hyperbilirubinaemia, 8.5% had respiratory problems and 2.8% had sepsis. From 0-4 months 70% of LBW babies gained double the weight, 73% of LBW babies had an average of 7cms increase in head circumference, 81% of LBW babies had an average of 7cms increase in chest circumference and 57% showed increase of 10cms in length. Of the babies that had not attained social smile by three months, 66.7% of babies less than 1500gms and 22.2% were above 2000gms which are IUGR babies that had not attained social smile either. Among the babies that had not attained complete neck control by 4 months, 76.9% of babies less than 1500gms.

CONCLUSION

Breast feed alone is sufficient for adequate growth in low birth weight babies. Antenatal and postnatal education for all mothers regarding breast feeding irrespective of gestational age and birth weight of baby is very important.

KEYWORDS

LBW, Head circumference, IUGR.

HOW TO CITE THIS ARTICLE: Sharanappa S, Venkatram R. A study on followup of low birth weight babies on exclusive breast feeding upto four months of age. J. Evolution Med. Dent. Sci. 2016;5(21):1128-1132, DOI: 10.14260/jemds/2016/262

INTRODUCTION

Birth weight is an important determinant of an infant's survival and future development.¹ Babies with a birth weight of less than 2500gms irrespective of the period of gestation are called low birth weight babies. These include preterm and small for date term babies.² The incidence of low birth weight baby continues to be high in developing countries like India at about 30% in contrast to 5-7% in developed countries. Out of 8 million LBW babies born in India every year, nearly 5.3 million babies are SGA.³ This study on LBW babies was undertaken to find out the incidence of low birth weight in Kempegowda Institute of Medical Sciences and also to followup the growth of these babies who were exclusively breast fed for a period of four months. The followup was

restricted to the first four months for logistic reasons, as many mothers shift to the husband's house after the 4th month.

The present rate of infant mortality is 74/1000, of which nearly two-third of deaths are due to neonatal mortality. Despite the advances in the neonatal care, our neonatal morbidity and mortality continues to be high.³ Hence, it is important to recognize IUGR babies because of high incidence of neonatal morbidity and its long-term sequences.

The factors responsible for LBW in our country is poor socioeconomic status contributing to maternal anaemia, inadequate prenatal care, improper pregnancy spacing, drug addiction, maternal infection, placental abnormalities and chronic illness.⁴

Neonatal morbidity and mortality bears inverse relationship with birth weight and gestation age. The LBW infants are five times more likely to die in the perinatal period and three times more likely to die among infancy. Hence, this study was undertaken.

AIMS AND OBJECTIVES

1. To estimate the incidence of low birth weight babies in Kempegowda Institute of Medical Sciences, Bangalore.

Financial or Other, Competing Interest: None.
Submission 06-01-2016, Peer Review 24-02-2016,
Acceptance 29-02-2016, Published 14-03-2016.

Corresponding Author:

Dr. Reshmavathi Venkatram,
37, 1st Main, RMV, 2nd Stage,
Amarjyothi Layout, Sanjaynagar,
Bangalore-560094.

E-mail: dr.reshma.venkatram@gmail.com

DOI: 10.14260/jemds/2016/262

- To assess the growth and development of low birth weight babies for the first four months who are on exclusive breast feeding and who attended well baby clinic in Kempegowda Institute of Medical Sciences, Bangalore from October 2014 to September 2015.

METHODOLOGY

Inclusion Criteria

- Birth weight less than 2500 grams.
- Babies who were only breast fed till 4 months.

Exclusion Criteria

- Congenital malformations like cleft lip, cleft palate.
- With any congenital diseases.
- Where breast feeding was contraindicated.

Study Period: October 2014 to September 2015.

All the babies delivered with a birth weight less than 2500 grams were included in the study and following details were recorded.

Maternal History

- Chronic illness in mother.
- Any illness during that pregnancy.
- Previous obstetric history.
- Delivery and its complications.
- Socioeconomic status.

For The Baby

- Birth weight, length, head and chest circumference.
- Gestational age using New Ballard score.
- Perinatal complications if any.
- Any congenital complications.

The advantage of exclusive breast feeding was explained to the parents and they were advised not to give any other feeds and also explained about the importance of regular

followup and neurological testing. They were asked to attend the well-baby clinic on Wednesdays at monthly intervals for first four months.

During each visit growth parameters were measured, developmental milestones were assessed and advice was given regarding feeding and immunization. A general physical examination and a neurological examination were done for all these babies in the study group. Vision and hearing was tested clinically.

Growth parameters (Length, weight, head and chest circumference) were taken at the time of examination. The neurological evaluation by Trivandrum Developmental Screening Chart was done, corrected age was used while evaluating preterm babies.

Cases that did not come for followup were telephonically informed to find out the reason for noncompliance and requested to come for followup clinic. Cases that showed developmental delay were again evaluated at 5 months and 6 months. Cases that still had developmental delay at 6 months were followed up with developmental neurologist.

STATISTICAL METHOD

- Chi-square test is used to find out the association between two qualitative variables.
- One way ANOVA test with repeated measures is used to compare the mean changes in growth parameters by month wise.

RESULTS

There were a total of 419 babies born during the study period. Out of these 124 had birth weight less than 2500, giving an incidence of 29.5%, but only 70 cases were included in the study. Among these 22 were term and Small for Gestational Age (SGA)/IUGR, 8 were preterm and small for gestational age and 40 were preterm and Appropriate for Gestational Age (AGA).

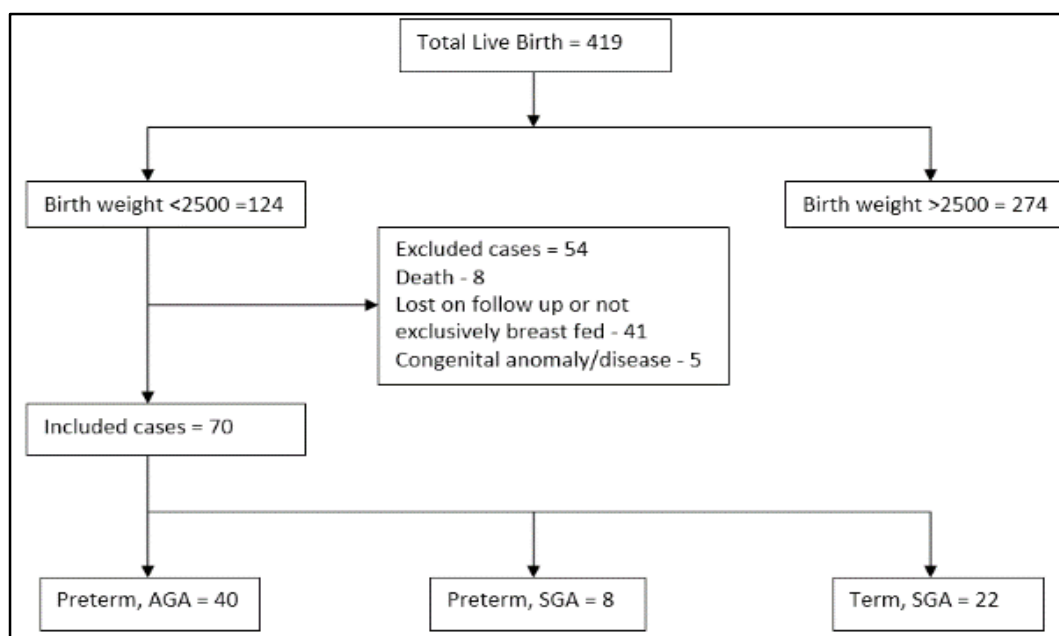


Fig. 1: Incidence of Low Birth Weight of the 70 cases studied 54.3% (38) babies were female and 45.7% (32) babies were female

	GESTATIONAL AGE (Weeks)			TOTAL
	28-32	33-37	>37	
BIRTH WEIGHT (grams)				
<1500	7	18	1	26
1500 – 2000	3	14	12	29
> 2001	0	6	9	15
TOTAL	10	38	22	70
HEAD CIRCUMFERENCE (cm)				
< 28.5	9	8	2	19
28.5-31.5	1	23	7	31
>31.5	0	7	14	20
TOTAL	10	38	22	70
CHEST CIRCUMFERENCE (cm)				
< 26	17	4	0	21
26-29	2	22	8	32
>29	0	2	15	17
TOTAL	19	28	23	70
LENGTH (cm)				
<40	7	13	1	21
40.1-45	3	18	13	34
>45	0	7	8	15
TOTAL	10	38	22	70

Table 1: Distribution of Weight, Head Circumference and Length of LBW Babies at Birth by their Gestational Age

Sl. No.	COMPLICATIONS	NO. OF CASES	PERCENTAGE
1	Bad obstetric history	2	2.9
2	Twins	8	11.4
3	Eclampsia/PIH	7	10.0
4	Anaemia	11	15
5	Diabetes	1	1.4
6	UTI	1	1.4
7	Malnutrition	40	57
8	Total	70	100

Table 2: Complications of Pregnancy

Sl. No.	COMPLICATIONS	NO. OF CASES	PERCENTAGE
1	Sepsis	2	2.8
2	Respiratory problems	6	8.5
3	Hyperbilirubinaemia	10	14.3
4	Uncomplicated	52	74.4
5	TOTAL	70	100

Table 3: Neonatal Complications

	NO. OF CASES	PERCENTAGE
BIRTH WEIGHT		
More than double the birth weight	49	70
Less than double the birth weight	21	30
TOTAL	70	100
HEAD CIRCUMFERENCE		
More than 7 cms	51	72.9
Less than 7 cms	19	27.1
TOTAL	70	100
CHEST CIRCUMFERENCE		
More than 7 cms	57	81.4
Less than 7 cms	13	18.6
TOTAL	70	100
LENGTH		
More than 10 cms	40	57
Less than 10 cms	30	43
TOTAL	70	100

Table 4: Improvement in Weight, Head Circumference, Chest Circumference, Length from Birth to fourth month

BIRTH WEIGHT (gms)	SOCIAL SMILE						TOTAL
	2-3 Months			> 3 Months			
	Preterm	Term	Total	Preterm	Term	Total	
< 1500	20	0	20 (32.8%)	5	1	6 (66.7%)	26
1500-2000	16	12	28 (45.9%)	1	0	1 (11.1%)	29
> 2000	4	9	13 (21.3%)	2	0	2 (22.2%)	15

Table 5: Neurodevelopmental Assessment of LBW Babies regarding Social Smile

Chi-square=4.718, p=0.095

There were 9 babies that had not attained social smile by the age of 3 months. Of these 9 babies, one was term and rest were preterm. These babies were followed up again at age of 4 months, by then only 5 babies had not attained social smile. By 5 months of age 3 babies had not achieved social smile, two were preterm who had reached corrected age of 3 months and one term baby.

BIRTH WEIGHT (gms)	HEAD HOLDING						NO HEAD HOLDING			TOTAL
	3-3.5 months			3.5-4 months			> 4 months			
	PT	T	Total (%)	PT	T	Total	PT	T	Total (%)	
< 1500	4	0	4(21.0)	12	0	12(31.5)	9	1	10(76.9)	26
1500-2000	3	7	10(52.6)	13	5	18(47.3)	1	0	1(7.7)	29
> 2000	0	5	5(26.4)	4	4	8(21.0)	2	0	2(15.3)	15

Table 6: Neurodevelopmental Assessment of LBW Babies regarding Head Holding

Chi-square=6.812, p=0.001, PT- Preterm, T- Term.

There were 13 babies that had not attained complete neck control by 4 months. Amongst these 12 were preterm and

1 was term baby. These babies were followed up again at 5 months, 5 of them had attained neck control. They were again

followed at 6 months, only 4 babies (3 preterm and 1 term) had not attained neck control. These babies that had not attained neck holding or social smile were closely monitored and regularly assessed by developmental neurologist.

ANOVA Test with the Repeated Measurements showed the following:

1. The mean birth weight of the babies were 1.70kgs with the standard deviation of 0.39kgs at birth. It increases to 2.07kgs at 1st month with the SD of 0.43kgs and further it is increased to 2.65kgs, 3.23kgs and 3.77kgs respectively on 2nd, 3rd and 4th month.
2. The head circumference of the babies were 30.02cms with the SD of 2.24cms at birth. It is increased to 31.7cms at 1st month with the SD of 4.11cms and further it is increased to 34.20cms, 36.03cms and 37.22cms respectively on 2nd, 3rd and 4th month.
3. The mean chest circumference of the babies were 26.97cms with the SD of 3.92cms at birth. It is increased to 29.23cms at 1st month with the SD of 2.30cms and further it is increased to 31.14cms, 33.33cms and 39.35cms respectively on 2nd, 3rd and 4th month.
4. The mean length of the babies were 42.26cms with the SD of 3.10cms at birth. It is increased to 44.90cms at 1st month with the SD of 3.10cms and further it is increased to 47.65cms, 50.10 and 51.71cms respectively on 2nd, 3rd and 4th month.

DISCUSSION

Birth weight is generally used as a yardstick of maturity. It is an important determinant of child survival and development.⁵ It is also a subject of clinical and epidemiological investigations and a target for public health intervention.⁶ The incidence of LBW babies in this study was found to be 29.5%.

Vijay Bhargava, et al. noted a female preponderance in the sex distribution.⁷ The present study showed similar distribution of girls and boys among LBW babies. There was slightly higher preponderance of female (54.3%) over males (45.7%); 21.4% of LBW babies were more than 2000 grams, 41.4% between 1500 to 2000 grams and the remaining 37.2% were less than 1500 grams. Thus, there is direct correlation between the birth weight and their gestational age (Table 1). Vijay Bhargava et al. also showed the same result.⁷

There was a significant association between the head circumference, length and their gestational age at birth (Table 1).

The complications of pregnancy which resulted in LBW babies were malnutrition (57%), anaemia (15%), 11% were twins and 10% were pregnancy-induced hypertension (Table 2). C. M. Drillen et al. showed the similar incidence of complicated pregnancies.^{8,9,10} Among the complication associated with neonates 74.4% cases were uncomplicated, 14.3% cases had hyperbilirubinemia, 8.5% had respiratory problems and 2.8% had sepsis. (Table 3) 70% of LBW babies gained double the weight from birth to fourth month of age, while 30% of LBW babies had not doubled the weight (Table 4). Kitchei et al. also showed similar results.¹⁰ 73% of LBW babies had an average of 7cms increase in head circumference, while 27% had not reached the average of 7cms. Fewtrell et al. had shown similar catch up growth in head circumference.¹¹ 81% of LBW babies had an average of 7cms increase in chest circumference, while 19% of LBW babies not reached the

average of 7cms. N.H. Kitchei et al. and O.P. Ghai, Chinn S et al. observed that low birth weight babies gained length at a slower rate.^{12,13} In the present study, 57% of LBW babies showed an increase of 10cms over the four months and 43% of babies showed less than 10cms increase in length (Table 4).

The large majority of developmental delays could be identified by using cut off points for two simple developmental milestones, namely social smile completed by two months and head holding completed by three months. Trivandrum Development Screening Chart (TDSC) is used for development assessment.¹⁴

There were 9 babies that had not attained social smile by the age of three months, 66.7% of babies less than 1500gms and 22.2% were above 2000gms (Table 5). These babies were followed till 5 months and finally 3 babies had not achieved social smile, two were preterm who had reached corrected age of 3 months and one term baby. There were 13 babies that had not attained complete neck control by 4 months 76.9% of babies less than 1500gms (Table 6). These babies were followed till 6 months and only 4 babies (3 preterm and 1 term) had not attained neck control. This implied that though babies could achieve appropriate milestone based on their corrected postnatal age, it is essential to monitor their development. TDSC serves as a helpful tool in identifying the babies that require frequent developmental monitoring.

CONCLUSION

Breast feed alone is sufficient for adequate growth of low birth weight babies. Antenatal and postnatal education for all mothers regarding breast feeding, irrespective of gestational age and birth weight of baby is very important. Regular developmental monitoring with simple developmental scales like TDSC helps identification of developmental delay in these low birth weight babies.

REFERENCES

1. Wilcox AJ. On the importance-and the unimportance-of birthweight. *International Journal of Epidemiology* 2001;30:1233-1241.
2. Ronald S Illingworth. The development of the infant and young child-low birth weight babies. Harcourt publications. 1999;9th edition:27-28.
3. Meharban Singh. Care of the newborn, CBS publications. 2015;8th edition:299-300.
4. Ghai OP. Early postnatal growth pattern of very low birth weight babies. *Indian Paediatrics* 1978;11(11).
5. WHO. Division of family health. The incidence of low birth weight, a critical review of available information. *World Health Stat Q* 1980;33:97-224.
6. UNICEF/WHO Low Birth weight, Country, Regional and Global Estimates. 2006.
7. Vijaya Bhargava, Sreedip G, Krishnakanth B. Survival growth and development in babies weighing 2000 grams or less. *Indian paediatrics* 1970;7(3):139-45.
8. Kumari S, Shendurnikar N, Jain S, et al. Outcome of low birth weight babies with special reference to some maternal factors. *Indian paediatrics* 1989;26:241-246.
9. Cecil M Drillian. A longitudinal study of the growth and development of prematurity and maturity born children. *Archives of diseases in children* 1961;36:72-74.

10. Maureen Hack, Harried F, Avroy AF. Outcome of extremely low birth weight infants. *Paediatrics* 1996;98(5):24-25.
11. Fewtrell MS, Morley R, Abbott RA, et al. Catch up growth in small for gestational age term infants: a randomized trial. *Am J Clin Nutr* 2001;74(4):516-23.
12. Kitchei NH. A longitudinal study of very low birth weight infants. *Development medicine and child neurology* 1980;22:163-171.
13. Chinn S, Rona RJ, Price CE. Need for new reference curves for height. *Archives of Diseases in childhood* 1989;64:1545-1553.
14. Nair MKC, George B, Philip E, et al. Trivandrum developmental screening chart. *Indian Paediatrics* 1991;28(8):869-872.