

Original Research Article

To assess gestational age by physical criteria such as foot length and intermammary distance

Dr. Rashmi Ekka Dehariya¹ (Senior Resident), Dr. Neha Jaiswal² (Senior Resident)

^{1,2}Dept. of Paediatrics, ESIC Hospital, Indore, M.P.

Corresponding Author: Dr. Neha Jaiswal

Abstract:

Background & Method: The aim of this study is to assess gestational age by physical criteria such as foot length and intermammary distance.

Result: 166(87.3%) babies were delivered by normal vaginal delivery while 24(12.7%) babies were delivered by caesarean section. In this study, 67(35.2%) babies were term, 118(62.1%) were pre-term and 5(2.6%) were post-term. Gestational age and foot length showed a positive correlation with a correlation coefficient of 0.89. When babies were subdivided into AGA and SGA the correlation of gestational age(GA) and foot length(FL).

Conclusion: Foot length measurement and intermammary distance can be easily used by peripheral health workers to differentiate between term and preterm babies.

Keywords: gestational age, foot length and intermammary distance.

Study Designed: Observational Study.

1. INTRODUCTION

Gestational age is the common term used in pregnancy which denotes the time period between conception and birth [1]. Knowledge about infant's gestational age is important because problems associated with gestational age can be predicted on this basis. Birth weight and Gestational age are the two most important criterions on determining neonatal and infant morbidity and mortality [2]. The most important cause for neonatal mortality is prematurity. Prematurity and its complications accounts for around 35% of neonatal deaths in India compared to 28% worldwide. The most important indicator of survival, growth and overall development is Birth weight. Low birth weight babies in India are 28% which is higher when compared to globally which is only 14.6% [3]. Low birth weight is associated with high mortality rate due to their predisposition to infections and difficulty in maintaining their required nutrition.

Gestational age can be assessed by date of last menstrual period, USG and certain scoring systems like New Ballard and Dubowitz. Date of last menstrual period is not very reliable because many patients have irregular cycles[4]. USG is out of reach of many poor patients. Different scoring systems use a number of neurological and physical criteria which are suitable for doctors but are cumbersome to use at remote places by paramedical staff. Foot length and intermammary distance are simple to measure and do not require much expertise[5]. Birth weight and Gestational age are directly proportional to the survival of the infant. Higher the birth weight and gestational age, higher will be their survival rate and vice versa.

2. MATERIAL & METHOD

The present study is conducted at ESIC, Indore Hospital, Indore from Jan 2020 to Dec 2020. 190 newborns delivered. Their gestational age ranged from 27 to 42 weeks. Newborns with following risk factors were excluded from the study:

- a) Duration of rupture of membranes >24 hrs.
- b) Maternal fever >38 degree Celsius.
- c) Foul smelling liquor, chorioamnionitis.
- d) Duration of labour >24 hrs.

Babies were weighed naked on weighing machine (BRAUN company) nearest to 50 gm at Labour room, MYH Hospital within 24 hrs of birth. The intermammary distance was measured by fixing one nipple to the zero mark on the ruler and noting the distance of other nipple on the ruler.

All the measurements were taken within 24 hrs of birth. Standard statistical methods used for data analysis included correlation coefficient, simple regression equation, mean and standard deviation.

3. RESULTS

Table 1: Maturity wise distribution of babies

	AGA	SGA
TERM	53	14
PRE-TERM	91	27
POST-TERM	5	0

In this study, 67(35.2%) babies were term, 118(62.1%) were pre-term and 5(2.6%) were post-term.

Table 2: Mode of delivery wise distribution of babies

NVD	LSCS
166	24

166(87.3%) babies were delivered by normal vaginal delivery while 24(12.7%) babies were delivered by caesarean section.

Table 3: Correlation between GA(wk) and FL(mm).

GA(WK)	NO OF BABIES	FL IN MM	SD	CORRELATION
27	4	50	0	
28	2	55	0	
29	4	56.5	1.7	
30	16	58.8	2.9	
31	06	60	0	
32	15	60.6	2.0	
33	29	64.7	1.1	
34	29	65.4	2.4	0.89
35	15	70	0	

36	2	70	0	
37	32	74.5	1.3	
38	15	77.0	2.2	
39	12	80.0	0.6	
40	14	82.9	0.8	
41	10	85.2	0.6	
42	5	87.9	0.9	

Gestational age and foot length showed a positive correlation with a correlation coefficient of 0.89. When babies were sub-divided into AGA and SGA the correlation of gestational age(GA) and foot length(FL).

Table 4: Correlation between GA (wk) and FL(mm)(AGA).

GA(WK)	n	FL-MEAN	SD	CORRELATION COEFFICIENT
27	4	50	0	
28	2	55	0	
29	4	56.5	1.7	
30	16	58.8	2.9	
31	06	60	0	
32	06	60.6	2.5	
33	22	65	0	
34	6	66.7	2.6	0.89
35	9	70	0	
37	30	74.4	1.4	
38	04	77.3	1.5	
39	6	79.9	0.6	
40	4	83.5	0.9	
41	5	85.1	0.6	
42	5	87.9	0.9	

4. DISCUSSION

This study was undertaken to devise a simple method of estimating gestational age so that para medical workers at remote places could easily identify preterm babies and refer them to higher centers for further management[6]. In this study gestational age estimation by NEW BALLARD SCORE was correlated with physical criteria of gestational age estimation such as foot length and intermammary distance[7].

In this study number of male and female newborns were 130 and 124 respectively. Of the 254 babies 5 were post-term, 152 were pre-term and 97 were term[8]. Both preterm and term babies were subdivided into average for gestational age (AGA) and small for gestational age(SGA) First, foot length and intermammary distance were correlated with birth weight of babies. Correlation coefficient of birth weight with foot length was found to be 0.94 by linear regression analysis. When babies were divided into AGA and SGA correlation coefficient of gestational age and foot length was 0.89 in AGA and 0.89 in SGA babies[9].

5. CONCLUSION

Foot length measurement and intermammary distance can be easily used by peripheral health workers to differentiate between term and preterm babies. Foot length and intermammary distance measurement are simple measures to differentiate between pre-term and term babies.

6. REFERENCES

- [1] Daga SR, Daga AS, Dighole RV, Patil RP. Anganwadi worker's participation in rural newborn care. *The Indian Journal of Pediatrics*, 1993 Sep-Oct; 60(5):627-630.
- [2] Sharma JN, Saxena S, Sharma U. Relationship between birth weight and other neonatal anthropometric parameters. *Indian Pediatr* 1988; 25:244-8.
- [3] Platt LD, Medearis AL, DeVore GR, et al. Fetal foot length: Relationship to menstrual age and fetal measurements in the second trimester. *Obstetr Gynaecol* 1988; 71:526-31.
- [4] Mhaskar R, Agarwal N, Takkar D, et al. Fetal foot length—a new parameter for assessment of gestational age. *Int J Gynaecol Obstetr* 1989;29:35-8.
- [5] Dighole RV, Patil RP. Managing very-low-birth-weight babies at home in a rural area. *World Health Forum*,1996;17(3):289-290.
- [6] Rondo PHC, Tomkins AM. Chest circumference as an indicator of intrauterine growth retardation. *Early Human Development*, 1996;44:161-167.
- [7] Hirve SS, Ganatra BR. Foot tape measure for identification of low birth weight newborns. *Indian Paediatrics*, 1993;30:25-29.
- [8] Kulkarni ML, Rajendran NK. Values for foot length in newborns. *Indian Pediatrics*,1992 Apr;29(4):507-509.
- [9] Sharma JN, Saxena S, Sharma U. Relationship between birth weight and other neonatal anthropometric parameters. *Indian Pediatrics*,1988 Mar;25:244-248.