INNOVATIONS

Assessment of proportional magnitude on developmental delay among preterm children attending paediatric OPD of selected Hospital of Puducherry

Mrs. Sarasu Dhananjayan[1], Dr. Sujatha sugumar [2], Mrs. Bhavani Sudhagar[3]

[1] Research Student, Pondicherry Institute of Medical Sciences, Pudhucherry,Pin Code: 605014. India.

[2] Professor, Head of the department , Department of Child Health Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, 605014, India.

[3]Associate Professor, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

Corresponding author E-mail: **sujatha.sugumar@gmail.com**

Abstract

Introduction: Growth and development is a fundamental feature of children. Growth and development purely depends upon the fulfillment of his basic needs of children. It must be satisfied for higher growth. Human development is the process of growing to maturity. Development is a lifelong process of physical, behavioral, cognitive and emotional growth and change. In the early stages of life from babyhood to childhood, childhood to adolescence and adolescence to adulthood enormous changes takes place. Throughout the process each person develops attitudes and values that guide choices, relationships and understanding. It's important to keep a careful assessment on premature child's development because there is also a need to check the development of the preterm children based on their corrected age to have accurate data and to follow their health status. **Objectives: 1.**To describe the proportional magnitude of developmental delay in preterm children.**2.**To associate the development of preterm children with selected demographic variables. **Materials and methods:** The design adopted for this study was quantitative descriptive design. The study was conducted in Paediatric OPD, Pondicherry Institute of Medical Sciences. Population was preterm children in age group of 3months to 3 years of age. Samples were preterm child attending Paediatric OPD PIMS .Convenience sampling technique was used to select the participants for the study. Fifty preterm children attended Pediatric OPD were recruited for the study. The tools used for data collection were demographic variables and standardized tool Trivandrum Development Screening Chart and Language Evaluation Scale Trivandrum. **Results**: The findings showed that 2% delay in Trivandrum development screening chart and 12%delay in Language evaluation scale Trivandrum. There was significant association with birth weight of preterm children and delay in their development. The study finding reveals that early identification of delay is possible by using screening tool. And it will helps in early intervention for the children. **Conclusion:** The study finding reveals that early identification of delay is possible by using screening tool. And it will helps in early intervention for the children.

Key words: 1.Developmental Delay 2. Preterm children 3.Magnitude of development

Introduction

Growth and development is a fundamental feature of children. Growth and development purely depends upon the fulfillment of his basic needs of children. It must be satisfied for higher growth1. Every year about 15 million babies are born prematurely around the world and that is more than 1 in 10 of all babies born globally. Around one million were dying die each year due to

various complications of preterm birth.1 Many of the preterm babies, who survive, suffer from various disabilities like cerebral palsy, sensory deficits, learning disabilities and respiratory illnesses. The morbidity associated with preterm birth often extends to later life, resulting in physical, psychological and economic stress to the individual and the family.3 Development refers to gross motor development, sensory development, intellectual development, emotional development, social development, sexual development and psychosocial development.4 Growth and development is important vital aspect of a child's life. It should be assessed periodically to measure a child's development and it is one way of measuring his/ her health. A steadily progressive trend in the pattern of growth and development of a child is a reliable index at the state of his/ her health. Parents education especially mother's education and economic status have a major role to play in enabling the growth and development of their children. It's important to keep a careful assessment on premature child's development because there is also a need to check the development of the preterm children based on their corrected age to have accurate data and to follow their health status. Preterm complications are the leading cause of death among children of under-five, approximately one million deaths in 2015(WHO report 2017).In India 33 lakhs preterm were born in 2015, it accounts for 22% of world preterm population. About 10-15% of very premature babies have cerebral palsy.5 In order to prevent the complications the preterm children are screened for development in earlier age itself.

Objectives

- To describe the proportional magnitude of developmental delay in preterm children.
- To associate the development of preterm children with selected demographic variables.

Materials and methods

The design adopted for this study was quantitative descriptive design.IRB approval was obtained from Institutional Review Board, College of Nursing, Pondicherry Institute of Medical Sciences. After obtaining IRB approval the study was conducted in Paediatric OPD, Pondicherry Institute of Medical Sciences. Data collection period was for one 5 weeks. Population was preterm children in age group of 3months to 3 years of age. Samples were preterm child attending Paediatric OPD PIMS .Convenience sampling technique was used to select the participants for the study. Fifty preterm children attended Pediatric OPD were recruited for the study. The tools used for data collection were demographic variables and standardized tool Trivandrum Development Screening Chart and Language Evaluation Scale Trivandrum.

Inclusion Criteria

- Children attending Pediatric OPD PIMS with preterm history.
- Children who were born between the gestation age of 28 weeks to 37 weeks attending pediatric OPD PIMS.

Exclusion Criteria

- Child without records regarding preterm birth.
- Children present with major congenital malformations.

Trivandrum Development Screening Chart

- It was developed and designed at the Child Development Centre, SAT Hospital, Government Medical College, Trivandrum, and Kerala in 1991.
- TDSC (0–6 y) is a simple, reliable and valid screening tool for use in the community to identify children between 0 and 6 years with developmental delay, enabling early intervention practices.

Language evaluation scale Trivandrum (LEST)

- LEST (0-3) is a simple, reliable and valid screening tool for use in the community to identify children between 0-3 years with delay in language development, enabling early intervention practices. LEST (0-3) was validated against Receptive Expressive Emergent Language Scale, for screening delay in language development among children of 0-3 years.

Statistical analysis

All data were recorded and entered in Microsoft Excel sheet. Frequency and percentage distribution were used to assess the background variables of the participants. The collected information was organized in excel sheet. Distribution of socio demographic variables of preterm children were organized in excel sheet**.** Inferential statistics Chi-Square will be used to test the association between the developments of preterm children with demographic variables.

Results

The analysis and interpretation of data had done according to the stated objectives such **as** to describe the proportional magnitude of developmental delay in preterm children and to associate the development of preterm children with selected demographic variables. TDSC mainly focus on motor ability of the children and it is used in this study, to assess mainly the motor skills of child from the age of corrected 3 months to 3years. LEST is used to assess the language ability of children from 3 months to 3 years of age. The study consists of preterm children from the age of corrected 3 months to 36 months of age. The child was assessed for both TDSC and LEST.

Maximum number of children 32(64) were male. Among that 36 children (72) were born between 32-36 weeks. Majority of mothers 26(52) are graduates the child (68) selected for the study are mostly between the age group of 12 to 36 months. Birth weight are categorized into 4 groups, that is less than 1 kg in first group, more than 1000 grams to 1500 grams in second group, more than 1500 -2000 grams in third group, and more than 2000 grams in fourth group. Among that majority of the children (32) were between 1500 grams to 2000 grams.The mothers of preterm children 27(54) had LSCS delivery because 39 mothers(78) had some complications during pregnancy and delivery. 34 mothers (68) had consumed no medication during antenatal period and 32 consumed medications during pregnancy for their complications. The preterm children 27(54) selected for the study were first baby in their family. On the basis of the income most of the mothers (50) belongs to income more than 20,000 per month most of the mothers (86) were non-working. **(Table1)**

Majority of mothers 26(52) are graduates. The study subjects mother 27(54) had LSCS delivery .because 39 mothers(78) had some complications during pregnancy and delivery.34 mothers (68) had consumed no medication during antenatal period and 32% consumed medications during pregnancy. The preterm children 27(54)selected for the study were first baby in their family .on the basis of the income most of the mothers (50) belongs to income more than 20,000 per month .most of the mothers (86) were non-working**.(Table2).**

Among the 50 preterm children 35 children had appropriate height and weight for their age. Remaining 15 children did not have appropriate height and weight for their age. Out of 15 children, 9 children did not have appropriate weight for their age. Out of 9 children 4 had delay in language development. And 6 children did not have both appropriate height and weight for their age. Among this 6 child had delay in TDSC assessment. So altogether 5 children had delay in both physical growth and development.

In this study, most of the mothers had preterm delivery because of premature rupture of membrane that is around 22 mothers (44) and 11 mothers (22) had preeclampsia during pregnancy and rest of them had other complications like hypothyroidism, cardiac disease. **(Fig: 1)**

As per TDSC assessment among 50 preterm children only one child found to have delay and 98% of children were normal. As LEST assessment out of 50 children 6 children (12) are found to have delay and 88% are normal in language development. **(Table3).**

The study associated the preterm development with selected demographic variables .chi square test and fisher exact test is used to find association between developmental delay and

demographic variables. On association, in TDSC assessment only 2% delay, so there is no significant association with demographic variables. By LEST assessment 12(6 children) had delay in language .Birth weight is significantly associated at the p value 0.02. **(Table4, 5, 6)** Table shows that there is no significant association between developmental delay and maternal variables

Discussion

The study is to describe the proportional magnitude of developmental delay among preterm children, as per the objective assessment done by using TDSC and LEST.As per the results, by TDSC among 50 preterm children only one child (2) found to have delay so that it shows 98% of children were normal. By LEST assessment 12 %(6 children) had delay in language

A longitudinally study was conducted on prevalence of suspected developmental delays in early infancy .The assessment done by using Age Stages Questionnaire .A sample of 1555 infants were examined in well baby clinic by using nowegian translation of ASQ at the age of 4months ,6monthsand 12 months. The findings shows that suspected developmental delay of 5.7% in 4 months infants and 7% in 12 months infants. Delay is found most frequently in gross motor area.11

Chattopadhay et al (2015) study was conducted by using the same tool but it was done among high risk new born using standardized tools like Denver Developmental Screening Tool II, Trivandrum Developmental Screening Chart and Amiel-Tison method of tone assessment .Developmental delay was found in 31.6% of children. As per the results of this study prevalence of NDD was significantly higher in low birth weight (LBW, >2 kg), preterm (<36 weeks) and twins. Neonatal sepsis/meningitis and convulsions also showed significant association with NDD. Among the 134children with developmental delay, 61 were preterm children, 80 were low birth weight children, with history of sepsis in 52children6.

A descriptive study among 200 children done among 0-3 years old children who are attending well baby clinic at Sree Gokulam Medical College, Salem. The result reveals that 22 children had speech and language delay that is 11% had delay in speech and language. The delay was found maximum in the age group of13-18 months.12

The study is also to associate the preterm development with selected demographic variables. Fisher exact test is used to find association between developmental delay and demographic variables. On association, in TDSC assessment only 2% delay so there is no significant association with demographic variables.

In this present study, Birth weight is significantly associated with developmental delay at the p value 0.02. And then association with mother's age at the level of p-value is 0.08.

Similar type of study was conducted among the age group of 0-3 years by using LEST. The study result shows that there is association between antenatal, postnatal risk factors with speech and language delay.

Mishra A (2015) conducted on assessment of speech and language delay among 0-3 year children attending well baby clinic Gandhinagar. The result reveals that that there is statistically significant association between the developmental delay and birth weight and also association found between gender and developmental delay.7

Conclusion

Preterm children are at increased risk of developing cognitive and motor impairment compared with children who are born at term. Small for Gestation related to early developmental delay and later language problem; however, neonatal complications may have a larger detrimental effect on long term cognitive development of very low birth weight infants than whether they are born small for gestation or appropriate gestational age. Early intervention programmes for preterm children have a positive influence on cognitive and motor outcomes. The present study paves way for early screening of risks of developmental delay among preterm children and helps for implementation of early intervention.

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Table1: Frequency and percentage distribution of Preterm children

n=50

Sl.No	Demographic Variable	Frequency (N)	Percentage (%)
1	**Age group**		
	a. 3-11 months	16	32
	b. 12-24 months	17	34
	c. 25 - 36 month	17	34
2	**Gestation at birth**		
	a. <28 weeks	2	4
	b. 28-32 weeks	12	24
	c. >32weeks-36 weeks	36	72
3	**Birth weight(kg)**		
	a. < 1000 Grams	2	4
	b. 1000 - 1500 Grams	14	28
	c. >1500 - 2000 Grams	16	32
	d. > 2000 Grams	18	36
4	**Birth order**		
	a. First	27	54
	b. Second	14	28
	c. >2	9	14

Table2: Frequency and percentage distribution of mothers of Preterm children
n=50

Sl.No	Demographic Variable	Frequency (N)	Percentage (%)
1.	**Mother's age**		
	a) <25 years	15	30
	b) 25-30 years	20	40
	c) >30 years	15	30
2.	**Occupation**		
	a) Working	7	14
	b) Non-working	43	86
3.	**Education**		
	a) Illiterate/primary	11	22
	b) High School	5	10
	c) Secondary	8	16
	d) Graduate	26	52
4.	**Income**		
	a) < 10000	4	8
	b) 10000-20000	21	42
	c) >20000	25	50
5.	**Type of family**		
	a) Nuclear	34	68
	b) Joint family	16	32
6.	**Type of conception**		
	a) Spontaneous	41	82
	b) Induced	9	18
7.	**Number of Children**		
	a) 1	25	50
	b) 2	16	32
	c) 3	4	8
	d) 4	5	10

Table3: Distribution of proportion magnitude of developmental delay by language evaluation scale Trivandrum

n=50

Sl.No	Assessment Report (Lest)	Frequency	Percentage
1.	Normal	44	88
2.	Delay	6	12

Table 4: Association of delay in language development of preterm children with selected demographic variables **n=50**

S.No	Demographic Variables	LEST Assessment		Fisher exact test – Value	p – Value
		Normal	Delay		
1	**Age in month**				
	3-11 months	16	0	3.36	0.08 NS
	12-24 months	16	3		
	25-36 months	14	3		
2	**Gender**				
	Male	29	3	-	0.65 NS
	Female	15	3		
3	**Gestation at birth**				
	>28 weeks	2	0	2.59	0.34 NS
	28-32 weeks	9	3		
	>32-36 weeks	33	3		
4	**Birth weight**				
	<1000g	2	0	8.3	0.02 S
	1000-1500 grams	9	5		
	>1500-2000 grams	16	0		
	>2000 grams	17	1		
5	**Birth order**				
	First	23	4	0.54	0.84 NS
	Second	13	1		
	>2	8	1		

NS = statistically not significant, p > 0.05
S =statistically significant, p< 0.05

Table5:Association of delay in language development of preterm children with Maternal variables. n=50

S.No	Demographic Variables	LEST Assessment		Fisher exact test	p – Value
		Normal	Delay		
1	**Mother's age**				
	<25 years	13	2	3.20	0.08 NS
	25-30 years	16	4		
	>30 years	15	0		
2	**Type of delivery**				
	SVD	20	3	-	1 NS
	LSCS	24	3		
	Vacuum assisted and others	0	0		
3	**Occupation**				
	Working	7	0	-	0.1 NS
	Non-working	37	6		
4	**Education**				
	Illeterate, Primary	10	1	1.72	0.77 NS
	High School	4	1		
	Higher Secondary	8	0		
	Degree	22	4		
5	**Family income**				
	<10000	2	2	4.56	0.09 NS
	10000-20000	19	2		
	>20000	23	2		
6	**Type of family**				
	Nuclear	29	5	-	0.65 NS
	Joint	15	1		

NS = statistically not significant, p > 0.05

Table 6 : Association of delay in language development of preterm children with Maternal variables. n=50

S.No	Demographic Variables	LEST Assessment		Fisher exact test	p – Value
		Normal	Delay		
1	**Type of conception**				
	Spontaneous	37	4	-	0.29 NS
	Induced	7	2		
2	**Number of children**				
	One	21	4	0.87	0.84 NS
	Two	15	1		
	>2	8	1		
3	**Type of marriage**				
	Consanguineous	6	4	-	1 NS
	Non-Consanguineous	38	2		
4	**Complication**				
	Yes	34	5	-	1 NS
	No	10	1		

NS = statistically not significant, p > 0.05

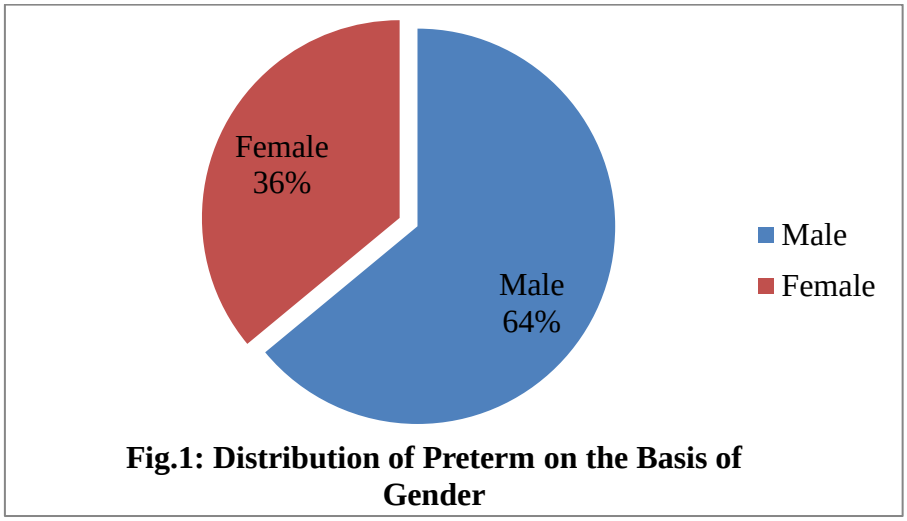

Fig.1: Distribution of Preterm on the Basis of Gender