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Gross Motor Performance Among Late Preterm Infants

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A B S T R A C T

Background: Late preterm infants are the neonates whose birth occur on the beginning of 239th day (34 0/7 weeks' gestation) to the ending of 259th day (36 6/7 weeks' gestation) since the onset of the first day of mother's last normal menstrual period presented with delayed milestones in terms of their gross motor performance.

Objective: To describe gross motor performance among late preterm infants in relation to their chronological age.

Methodology: An observational descriptive cross-sectional survey on a total of 49 patients (n=49) was conducted at Children Hospital, Lahore with non-probability convenient sampling technique (1). Late preterm infants, both male and female between age 2-18 months were included, diagnosed cases of cerebral palsy, Spina bifida, Developmental dysplasia of hip, Down syndrome and Muscular dystrophy were excluded. Alberta infant motor scale (AIMS) was used for assessment after taking written consent from parents of infants (2).

Results: The mean age of 49 infants were 8.15 months and the standard deviation 4.479. There were 27 (55%) males and 22 (45%) females out of 49 infants. Out of Forty-Nine late preterm infants, 31(63%) infants were presented with atypical performance, 7(14%) with suspected performance, 7(14%) with normal performance, 1(2%) with good performance and 3(6%) with excellent performance as indicated by their respective percentile ranks.

Conclusion: Late preterm infants show lower gross motor performance as most of the infants were presented with atypical performance.

Introduction

Late preterm infants (gestational age 34 weeks, 0 days to 36 weeks, 6 days) account for 75% of preterm births according to the American Academy of Pediatrics, American College of Obstetrics and Gynecology, and World Health Organization. [1]

Preterm infants exhibit variation in their motor developmental pathways, as motor developmental is characterized as a nonlinear process during which rapid development and stable motor performance may occur alternately. It has been assumed that late preterm infants were similar to full-term infants, with little risk for long-term morbidities, but increasing evidence suggests that late preterm infants have higher rates of learning problems than their full-term counterparts. [2]

The mortality of late preterm infants is decreasing with the advent of technology and development in perinatology.[3] Annually, 15 million infants are born preterm worldwide. In Pakistan, the prevalence of preterm infants is 15.8% and is the fourth highest country worldwide in terms of preterm births with the increasing statistics of 748,100 preterm infants born annually. [1]

Common complications of late preterm births include respiratory distress syndrome, transient tachypnea of the newborn, hypoglycemia, temperature instability, jaundice, sepsis, periventricular leukomalacia and neurological disabilities.[4] Late preterm infants show less neurodevelopmental outcomes. [5]

As late preterm infants are at risk of developing certain complications, so their closed continuous monitoring is required for 24 hours after birth. Occupational and physical therapy is helpful for late preterm infants as it addresses developmental delays or difficulties including gross and fine motor delays and provides therapeutic interventions. [6]

The rationale of the current study was to describe the gross motor performance among late preterm infants, that was important to examine motor development in preterm infants to help identify early those who may later show developmental disorders and to provide early intervention when the brain is adaptable to change. It would be equally helpful for physical therapists, occupational therapists and patients for better rehabilitation.

Methodology

An observational descriptive cross sectional survey on total of 49 patients was conducted at Children Hospital, Lahore with non-probability convenient sampling technique.[1] The sample size of 49 subjects was calculated by using below WHO formula, with 10% margin of error (d), 0.15 anticipated population proportions of patients. Late preterm infants both male and female with age between 2-18 months were included while all other diagnosed cases of cerebral palsy, Spina bifida, Developmental dysplasia of hip, Down syndrome and Muscular dystrophy were excluded. Alberta infant motor scale (AIMS) was used for assessment after taking written consent from parents of infants, it has validity 0.98.[7] Statistical package for social sciences (SPSS) version 23 was used for data entry and data analysis.

Results

There were 49 infants with mean age of 8.15 months and standard deviation 4.479. There were 27 (55%) males and 22 (45%) females out of 49 infants.

Age wise distribution and Gross Motor Performance: Out of 49 infants, 30 infants were less than and equal to 8 months of age. Out of these 30 infants, 16 infants presented with atypical performance, 5 with suspected performance, and 7 with normal performance, 1 with good performance and 1 with excellent performance. From 9-18 months of age, 15 infants showed atypical performance, 2 with suspected performance and 2 with excellent performance.

Table II: Frequency of motor performance

Variables	Frequency	Percent	Valid percent	Cumulative percent
Atypical performance	31	63.3	63.3	63.3
Suspected performance	7	14.3	14.3	77.6
Normal performance	7	14.3	14.3	91.8
Good performance	1	2.0	2.0	93.9
Excellent performance	3	6.1	6.1	100.0
Total	49	100.0	100.0	

(Table II) Out of Forty-Nine late preterm infants, 31 infants were presented with atypical performance, 7 with suspected performance, 7 with normal performance, 1 with good performance and 3 with excellent performance as indicated by their respective percentile ranks.

Discussion

The current study was aimed at advancing our insights to describe the gross motor performance of late preterm infants assessed by using AIMS. The adjusted chronological age of prematurity was corrected by subtracting child gestational age from chronological age

Table I: Motor performance with reference to age

Age groups	Gross Motor Performance					Total
	Atypical performance	Suspected performance	Normal performance	Good performance	Excellent performance	
≤ 8 months	16	5	7	1	1	30
9-18 months	15	2	0	0	2	19
Total	31	7	7	1	3	49

and their difference was subtracted from 40 weeks. was corrected for the degree of prematurity for the assessment of gross motor performance of late preterm infants as suggested by the Gullion in their study. [8]

This study was very similar to their study in many aspects like small sample size (n=43), low risk preterm infants included, and neurologically impaired infants were excluded. None of the infants were malnourished as it was found in studies that malnutrition cause nutritional insult to the brain of infants that can have long term effects. [9]

Infants identified as Atypical in their performance were less likely to be credited with items requiring antigravity control like (prone mobility, swimming, four points kneeling, sitting without arm support and all standing positions). Most of them were not credited in items that require trunk rotation as trunk extensors in preterm infants have high active muscle power relative to passive muscle power and less mobile postural behavior was found in them. [10]

Out of 3 infants with excellent performance, the mothers of two late preterm infants with excellent performance and the mother of one with good performance reported that they change the lying positions (that was side lying, tummy time, back to sleep position) of their babies regularly and maintain their correct functional positions. This was evident with the findings of the study of Burke.[11]

Mostly children were presented with atypical gross motor performance regardless of age domains, so its need of the hour to address the preterm infant's impairments, limitations and disabilities to uplift the desired goals to set the benchmark in preterm child performance.

The administration of AIMS tool was very difficult both for the researchers and children. There were no proper guidelines to administer this. By following the pictorials system, the researcher completes the task.

In the current study the sample size was small, and the study was conducted at Lahore only. Most of the infants included in the study were hospitalized so they were lethargic and were not performing well. This led to their lower percentile ranks. Because of insufficient time, it was difficult to compare preterm infants with full term infants. Also, assessment in infancy does not predict their gross motor performance at later stages of life so it is suggested that assessment at a later age should be carried out to evaluate later outcomes.

Conclusion

Late preterm infants show lower gross motor performance as most of the infants were presented with atypical performance.

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