

Motor Development Evaluation of Low Risk Preterm Infants through the First Six Months of Life

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Abstract

Preterm and low birth weight children are at risk for developmental deficits, many preterm children even who do not develop cerebral palsy not having reached normal motor development level regarding their chronological age. Normal motor development starts at conception and continue throughout life according to a typical sequence, pattern and timing. Evaluation and early detection of developmental deviation in preterm infants will improve the concept of early intervention and result in better quality of life to the preterm infants and their families. A longitudinal, quantitative, comparative study-one hundred infants: Preterm and full-term infants were evaluated by Alberta Infant Motor Scale (AIMS) through the first 6 months of life. There was significant difference in mean values AIMS of preterm and full term newborns. Further studies are needed to assess motor development in preterm using corrected age.

Keywords: Alberta Infant Motor Scale, Motor Development, Preterm Infants

Introduction

World Health Organization defines preterm delivery as the fetus delivery before completed the 37 weeks of gestation. Preterm infant classified as moderately premature if they born at gestational age 32-36 weeks and very and extremely premature if they born at gestational age 31 – 28 weeks or below [1].

Improved neonatal care has resulted in the increased survival of preterm infants. Preterm birth is the most important cause of perinatal mortality and morbidity. Preterm infants are those born before 37 weeks gestation. Very preterm babies are delivered at less than 32 weeks and extremely premature are babies of less than 28 weeks [2]

Many systems including the central nervous system are not completely developed when the preterm fetus is born which put the preterm infants at risk of growth and development delay [3].

Low-risk preterm infants are considered clinically similar to full-term infants. The nervous system pathology is less frequent in low-risk preterm infants. However, low-risk preterm infants are not only less physiologically and metabolically mature than full-term infants, but also their central nervous system is more immature. Thus, the neurodevelopment outcomes between these groups are often distinct [4].

Maturation of the central nervous system considered as evidence of motor development in infants and there is less concern to the examination of the musculoskeletal system. In low-risk and high-

risk preterm, both have an increase in trunk extension, decreased the hips elevation in a prone position and external rotation of the hips compared with full-term infant [5].

preterm and with low birth weight infant are at risk for abnormal development, sensory integration disorders are most commonly reported for these population [6].

Preterm infants often suffering from muscle weakness especially in the trunk and shoulder muscles which may affect the posture control and lead to poor motor development [7].

This study was a trail to answer the question: Do low risk preterm infants have different gross motor development sequence compared to full term infants either in acquiring milestone in proper timing or in the quality of movement acquired?

Methods

A longitudinal, quantitative, comparative study-one hundred infants: Preterm and full-term infants were evaluated through the first 6 months of life. They were classified into two groups :(Group A) contained fifty preterm, (Group B) contained fifty full-term, Infants were evaluated by Alberta Infant Motor Scale (AIMS). The AIMS is an infant developmental test, was to identify motor delay. It evaluates motor performance from birth to independent walking. The AIMS raw score were used to compare between development full term & preterm infants.

Data Analysis & Statistical Design

Un-paired t-test was used to measure the difference between Full term & preterm groups in all measured variables. All statistical

calculations were done using computer program SPSS.

Results

There was significant difference in mean values AIMS of preterm and full term newborns and there was significant difference in mean values AIMS of preterm and full term infants after six-month.

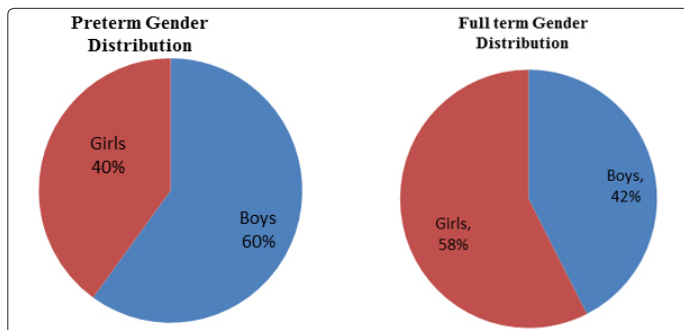


Figure 1: Gender distribution in both groups

Comparison between mean value of preterm and full term newborn Alberta Infant Motor Scale:

As showing in table (1) & figure (2) there was significant difference in mean values AIMS of preterm and full term newborns. The mean values were 2.15 ± 1.3 and 3.79 ± 0.695 for both groups respectively.

Table 1: Comparison between mean value of preterm and full term newborn Alberta Infant Motor Scale:

Group	mean values \pm SD	Mean Difference	Unpaired-t value	Probability	Significance
Preterm	2.15 ± 1.3	- 1.645	-6.328	0.000	Sig
Full term	3.79 ± 0.695				

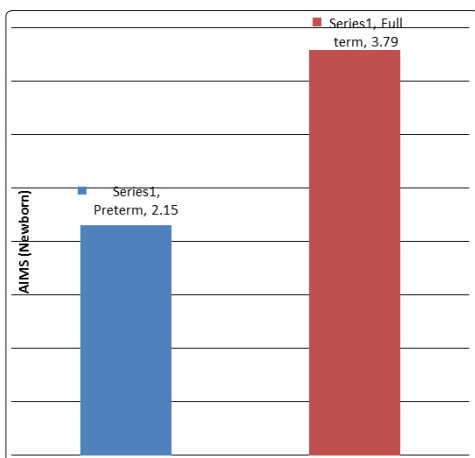


Figure 2: G (A)- mean values for AIMS Scale for both groups

As illustrated, when comparing the mean values of AIMS of preterm and full term newborns. The mean values were 2.15 ± 1.3 and 3.79 ± 0.695 for both groups respectively.

Comparison between mean value of preterm and full term infant at six-month old Alberta Infant Motor Scale:

As showing in table (2) & figure (3), there was significant difference in mean values AIMS of preterm and full term infants. The mean values \pm SD were 19.13 ± 2.1 and 23.6 ± 1.9 for both groups respectively.

Table 2: Comparison between Alberta Infant Motor Scale mean value of preterm and full term infant:

Group	mean values \pm SD	Mean Difference	Unpaired-t value	Probability	Significance
Preterm	19.13 ± 2.1	-4.487	-9.66	0.000	Sig
Full term	23.6 ± 1.9				

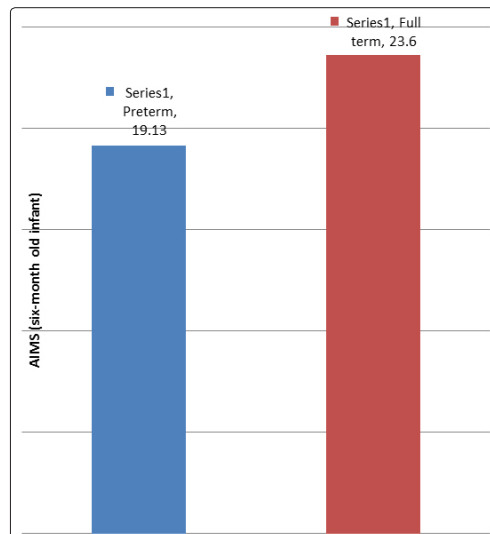


Figure 3: G (B) Mean values of AIMS for both groups. As shown: there was significant difference in mean values AIMS of preterm and full term infants. The mean values \pm SD were 19.13 ± 2.1 and 23.6 ± 1.9 for both groups respectively

Discussion

According to Wolf et al, Preterm infants delivery occurs in a stage of the central nervous system development, which is essential for the stability, mobility and motor development [3].

The results preterm and full term newborns may be attributed to the fact that body system development and maturation delay in preterm infants may be owing to many factors that include poor immunity and feeding problems as stated by Amess et al.,[8].

Sweeny & Gutierrez stated that the preterm newborns are very vulnerable to the NICU environment and the gravity effect, that lead to extension and difficulty performing flexion motions, so these result in more motor development [9].

According to Guimaraes et al., many factors in the environment of the neonatal intensive care unit that may have a bad effect on preterm infant development as high noise, lack of day/night cycles and too much handling [10]. The intra-uterine environment has tactile, kinetic, rhythmic and temporarily organized stimuli (e.g. mother heart bit).

Conclusion

The results of this study showed that moderate and even late preterm who escaped major birth anomalies had motor and social development delay in comparison with full term infants. These results may be attributed to negative effect of prematurity, early extra-uterine life with all the sensory stimulation that affect the preterm infant and delayed integration of postural reactions.

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