

A study on Prevalence & Antecedents of Developmental delay among Children less than 2 years attending Well Baby Clinic

Zafar Meenai, Sheela Longia

Department of Pediatrics, People's College of Medical Sciences and Research Centre, People's Campus Bhanpur, Bhopal-462037 (M.P.)

Abstract:

This prospective study was carried out to find the prevalence of developmental delay in 200 apparently healthy children below 2 years of age. Parents of the subjects were interviewed. The children were observed and assessed for their milestones on Trivandrum Developmental Screening chart (TDSC). The length, weight and head circumference of the children were measured and recorded. We could find out the prevalence of developmental delay in 9.5% of apparently healthy children by using a simple screening tool i. e. TDSC which can be administered in an office practice. If one can diagnose developmental delay in early stages of development, the early intervention can reduce a long term sequelae.

Key Words: Developmental delay, Trivandrum Developmental Screening chart, screening tool, risk factor, early intervention.

Introduction:

Development refers to qualitative & quantitative changes & acquisition of a variety of competence for functioning optimally in a social milieu. Developmental delay is said to exist if the child does not reach developmental milestones at the expected age. Human development is a complex phenomenon. It comprises of physical development, intellectual development, personality and social development. Development of a child is influenced by many factors that can mainly be categorized into genetic (intrinsic) & environmental (extrinsic).

Children are placed at genetic risk by being born with a genetic or chromosomal abnormality. Environmental risk results from exposure to harmful factors either before or after birth and include poor maternal nutrition, maternal stress, poverty, exposure of pregnant mother to certain drugs, toxins, irradiation; infections that are passed from a mother to her baby during pregnancy (TORCH & HIV) or during birth. Children born prematurely are at a greater risk of developing developmental delay. Besides above factors, birth asphyxia, birth injuries, neonatal sepsis, hyperbilirubinaemia etc. may also contribute to developmental delay.

Study of child development had been the curiosity of man since the end of 18th century. The first

detailed record of development of a child was published by Tiedemann in Germany (1787). Almost a century later, in 1872, Charles Darwin published a detailed account of the development of his own child upto 18 years of age. He described the cephalocaudal sequence and the continuous developmental process in a child. In 1912, Stern & Kuhlman suggested that the child's relative status could be indicated by a ratio between his mental age and his chronological age – the Intelligence Quotient (IQ). Arnold Gesell in 1925 established norms of development in a series of children (Marchese, 1995). In 1933, Bayley established norms for cognitive development on a large number of children. In 1954, Ruth Griffiths published the Denver Study based on a sample of 1000 children for developmental assessment. Franzenberg et al (1981) later described a revised and abbreviated Denver Screening Test. In 1977, Prechtl in his book "The Neurological Examination of the Full-Term Newborn Infant" described various reflexes such as rooting, Moro's reflex etc. and the information which they provide about the biological condition of the neonate. The Bayley scale was standardized for Indian population by Pramila Pathak in 1963.

Methodology:

This prospective observational study was performed at People's College of Medical Sciences & Research Centre Bhanpur, Bhopal on randomly selected 200 apparently healthy children attending well baby and Immunization clinics of Pediatric Department. All the children were below 2 years of

Corresponding Author: Dr. Zafar Meenai, Child Development Cell, Department of Pediatrics, People's College of emdical csiences and Research Center, People's Campus Bhanpur, Bhopal-462037 (M.P.)
Phone no: 0755 4005159, 9993958512
E-mail: anilanjukapoor@yahoo.com

age. The subjects were from the middle and lower socio – economic strata of society residing in and around the college. Environmental factors greatly varied among the subjects depending on their habitat.

Inclusion criteria: Children less than two years of age, apparently healthy children.

Exclusion criteria: Children with obvious delay related to neurological causes, dysmorphism, physical disabilities.

A detailed antenatal, natal and postnatal history was taken and recorded. Each child was subjected to a thorough general & systemic examination including anthropometry measurements, and these findings were recorded on a pre-structured proforma. Milestones of every child was assessed on TDSC.

Trivandrum Development Screening Chart (TDSC) consists of 17 items. The items are represented as horizontal bars; the left side represent 3% and the right side represent 97% of the population who should have achieved the milestone. The items mentioned in the TDSC are a combination of various developmental milestones achieved by a child at a particular chronological age. The particular developmental milestone is represented as a bar spanning over a period of few months. For example, transfer of objects is shown to have been achieved from four months to seven months of age. However, if the child has not achieved it at the upper limit of that particular item (seven months in this example), that particular item is considered to be delayed. The items considered in the TDSC are:

- Social smile
- Eyes follow pen \ pencil
- Holds head steady
- Rolls from back to stomach
- Turns head to sound of bell \ rattle
- Transfers objects hand to hand
- Raises self to sitting position
- Standing up by furniture
- Fine prehension pellet
- Pat a cake
- Walk with help
- Throws ball
- Walks alone
- Says two words
- Walk backwards
- Walk upstairs with help
- Points to parts of doll.

Results and Discussion:

Nineteen children out of 200 included in this study were found to have developmental delay using Trivandrum Developmental Screening Chart.

Seven children (36.84%) were less than 6 months of age, equal number of children were of age between 6 to 12 months, three children (15.78%) were between 12 months to 18 months of age and two children (10.52%) were between 18 to 24 months (Table I).

Table I: Showing age & sex distribution of children with developmental delay.

Age break up of positives (Months)	Boys	Girls	Total
02 to 3.9	2	1	3
4 to 5.9	2	2	4
6 to 7.9	1	1	2
8 to 9.9	1	1	2
10 to 11.9	1	2	3
12 to 13.9	1	1	2
14 to 15.9	0	0	0
16 to 17.9	0	1	1
18 to 19.9	1	0	1
20 to 24	1	0	1
Total	10	9	19

Table II: Showing Antecedents and medical conditions associated with developmental delay.

Item	Total
Birth asphyxia	3
Seizures	2
Sepsis	2
Meningitis	2
Respiratory	2
Jaundice	2
Congenital cardiac problems	3

Antecedents of developmental delay:

Above table (Table II) shows the antecedents of high – risk factors in children with developmental delay. Few children had more than one antecedent or medical condition. Eleven out of 19 children had antecedent history (57.89%) of specific mentioned items. Out of these 11 children, birth asphyxia was noted in three (15.78%), history of seizures in two (10.52%), sepsis in two (10.52%), respiratory problems in two (10.52%) and neonatal jaundice in two (10.52%) children. Congenital cardiac problem was detected in three children (15.78 %). One child had visual

problem and two had hearing defects. Children diagnosed to have developmental delay was given intervention therapy as per their need.

Prevalence of developmental delay ranges from 3.5% to 10% of the general population in various studies (Lewis & Judith, 1994; William (CTF), 1994; Nair & Radhakrishnan, 2004; Louise et al, 2002; Rydz et al, 2005). A study on two year neurological outcome on low birth weight infants showed functional disabilities in 26.7% of cases and suggested that the factors associated with functional disability included neonatal illness, poor weight gain and re – hospitalization. (Were & Bwibo, 2006).

Conclusion:

The study was conducted on 200 apparently healthy children below 2 years of age attending immunization and well baby clinic of the Department of Pediatrics of People’s College of Medical Sciences & Research Centre, Bhopal. We could find out the prevalence of developmental delay in 9.5 % of

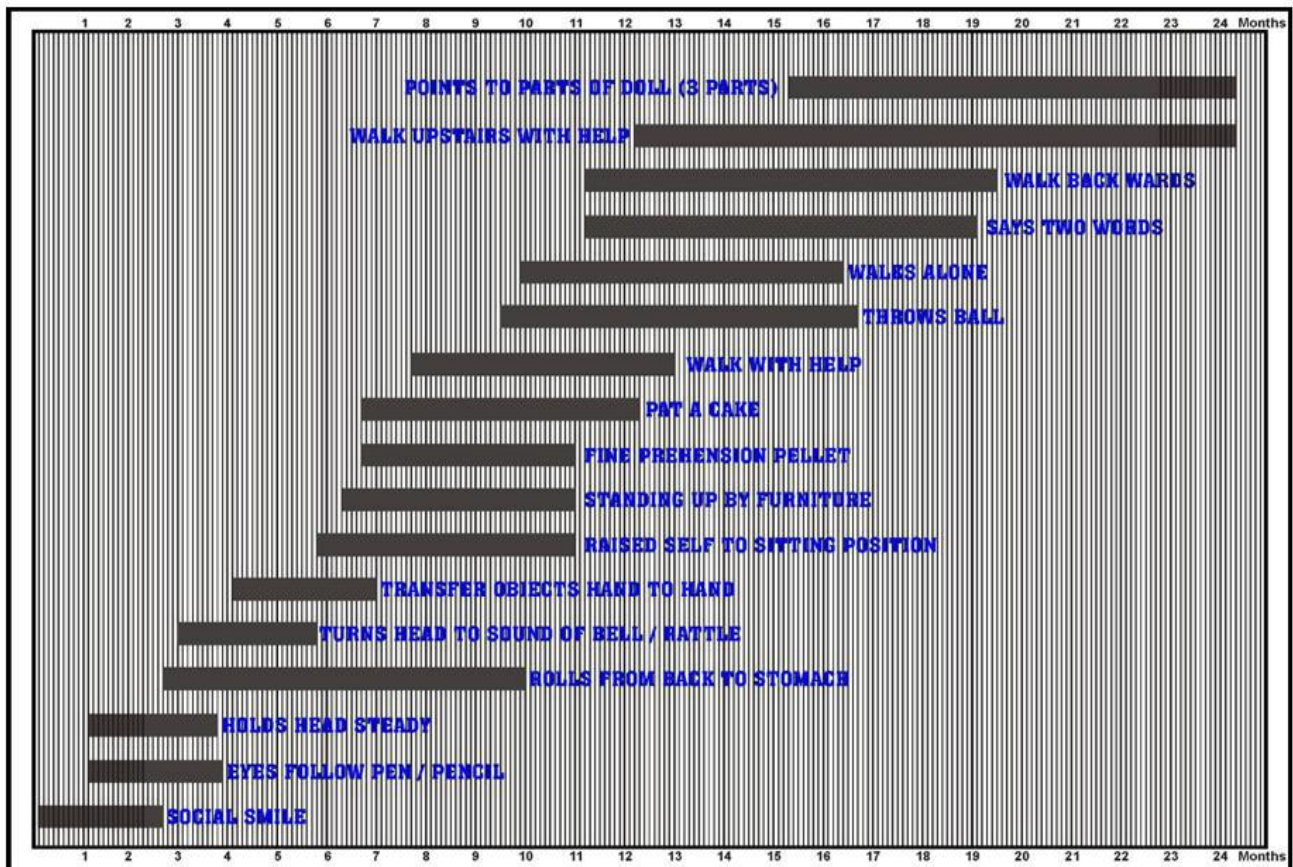
apparently healthy children as early as three months of age by using a simple screening tool i.e. TDSC. Children diagnosed with delay were given early or definitive intervention as per their requirement.

Establishing comprehensive child development cells in at least every medical college can help in promoting mass awareness of developmental delay. Its early detection and early intervention can reduce long term sequelae.

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Chart 1: Showing Trivandrum Developmental Screening chart (By Courtesy: Nair et al, 1991)



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