

Guide for monitoring child development in Indian setting

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Abstract

A study to know the prevalence of neurobehavioral developmental delay among children aged three years residing in rural communities of India using Guide for monitoring child development (GMCD). About 530 children at three years were assessed for developmental delay. The GMCD was administered to mothers by a trained interviewer. Prevalence of neurobehavioral developmental delay was estimated and validity of GMCD screening tool was monitored in Indian children. Chi-square test was used to compare categorical variables. Differences were considered significant at $P < 0.05$ level. The results showed that the prevalence of developmental delay assessed by GMCD was 48.5%. Children displayed delay in activity for self (46.8%), communication (39.2%) and understanding skills (13.2%). The results suggest a high prevalence of neurobehavioral developmental delay and poor child health in this rural population. Implementing early intervention programs may ameliorate the long term consequences of these developmental disorders. In the present study GMCD showed as a better validity screening tool for assessment of neurobehavioral developmental delay in children.

Keywords: Guide for monitoring child development, Child development, Developmental delay

Abbreviations Used: GMCD: Guide for monitoring child development, WHO: World health organization, PHC: Primary health centre

INTRODUCTION

Child development is multidimensional. These dimensions, which are interdependent, include social, emotional, cognitive, and motor performance, as well as patterns of behaviour and health and nutritional status. [1] The first few years of life are particularly important because vital development occurs in all domains. The brain develops rapidly through neurogenesis, axonal and dendritic growth, synaptogenesis, cell death, synaptic pruning, myelination, and gliogenesis. [2]

Identifying children's competencies and examining how they achieve those competencies is an integral part of more recently developed assessments.[3] Developmental assessment is an ongoing process of systematic observation and analysis, the purpose of which is to understand the child's competencies and resources and the caregiving and learning environments most likely to assist the child in making the best use of his or her developmental potential.[4] Early identification of developmental disorders is critical to the well-being of children and their families. It is an integral function of the primary care medical home and an appropriate

responsibility of all pediatric health care professionals. [5]

Reliable national data on the prevalence of various developmental disabilities are scanty even in highly developed countries. The estimated national prevalence of the individual developmental disabilities ranged from approximately 0.2% for cerebral palsy to 6.5% for learning disabilities in US children. Similar Indian data is virtually nonexistent.

Isolated macro (National Sample Survey, 1981-1983) and micro prevalence surveys have been conducted, mostly by non medical personnel. Firm conclusions based on these surveys are difficult due to variations in methodology, definitions and age groups studied. Nevertheless, it is reasonable to conclude that developmental disabilities are a significant problem in our *milieu* too. The reported prevalence ranges from 5.4% to 15.3% of the entire population. These figures are likely to be underestimates since only the severer disabilities would have been identified by the survey methodology. Several compelling reasons, therefore, necessitate the need for directing urgent action towards prevention, control and management of developmental disabilities in our context.[6]

Multidisciplinary team work is the cornerstone of ideal management of children with developmental disabilities. A feasible integration of child development with other components of child health monitoring is the current goal in the context of developing countries.

Parental Participation: The pivotal role of parental participation in management of developmental disabilities is well established in developed societies. Parental concern should not simply be met with reassurance, but should be taken as a valuable indicator of either

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probable developmental problems or the parent's needs. The existing health infrastructure should be utilized for optimal cost effectiveness. [6]

METHODS

The present study was conducted under the auspices of the Department of Physiology among children aged three years and residing in consigned Primary Health Centre (PHC) area attached to the J. N Medical College, Belgaum. The study was a cross sectional study to assess the prevalence of developmental disorders among the children aged three years. The study was approved by Institutional Ethics Committee for Human Subjects Research. Parents (primary care giver is a parent) of enrolled children were provided with GMCD to fill. Help was provided both by anganwadi worker and investigator based on their literacy status. GMCD questionnaire were written in regional language and was administered by the investigator and Anganwadi worker, to make it culturally appropriate. Children born between April 2005 to March 2006 were enrolled in the study. Children who had reached 36 months were selected for the study. All mothers of the eligible children were approached for participation and an informed consent was administered. The sample size was estimated to be 530 by allowing 20% error on account of mortality during the second and third year, missed out cases, refusal to participate and treatment initiated before three years.

The Guide for Monitoring Child Development monitoring

component is a practical, open-ended interview that catalyzes communication between clinicians and caregivers and obtains a portrayal of the child's development. Preliminary criteria for interpreting the GMCD were developed to examine concurrent validity. If the child was reported to exhibit all of the milestones at age level, the GMCD interpretation was classified as "appropriate for age." If the child did not demonstrate ≥ 1 of the age appropriate milestones, the GMCD interpretation was classified as "requires follow-up evaluation with or without intervention."

RESULTS

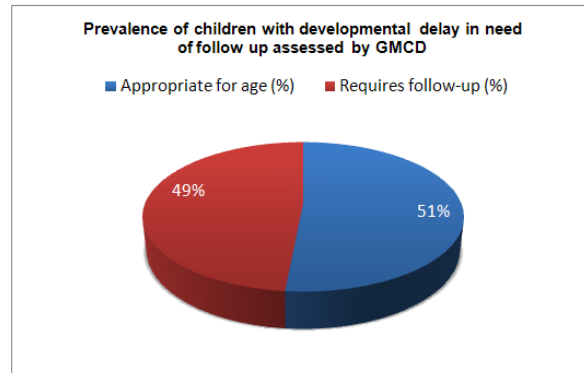
Assessment of growth and developmental disorders was done by GMCD in 530 children. Prevalence of developmental delay and delay in individual domain was calculated.

Developmental outcomes

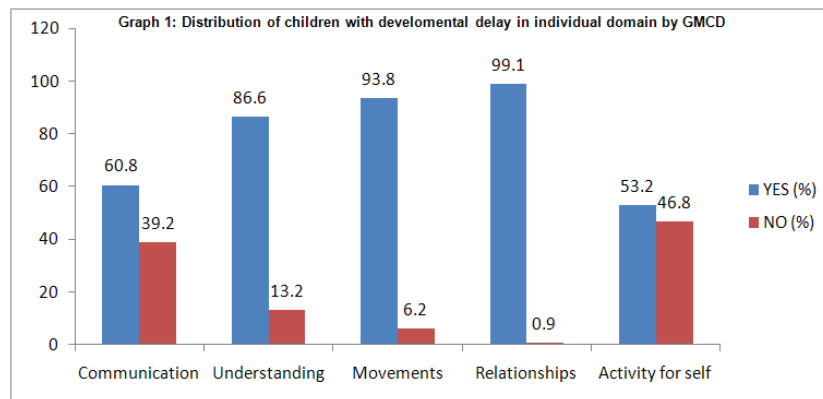
The prevalence of developmental delay assessed by GMCD was found to be 48.5% of children, which shows that a large percentage of children were in need of further follow up after GMCD assessment (Graph 1).

GMCD assessment outcome in individual domain

A Large proportion [248(46.8%)] of children were found to lag behind in Activity for self, followed by communication skills [208(39.2%)] with GMCD screening tool (Graph 2).



Graph 1: Prevalence of children with developmental delay in need of follow up assessed by GMCD



Graph 2: Distribution of children with developmental delay by GMCD

DISCUSSION

Development of the central nervous system (CNS) is a dynamic process that occurs as a cascade of events, with each step dependent on the completion of the previous step. The most rapid periods of CNS maturity in humans occur in utero, during infancy, and at puberty. [7]

It has been shown by medical and educational research that mental growth i.e., the development of intelligence, personality, and social behavior, occurs most rapidly in humans during their earliest years and hence are at heightened susceptibility to the adverse effects of environmental toxins and other negative factors such as chronic malnutrition, nutrient deficiencies, and lack of developmental stimulation leading to neurological and behavioral disorders such as learning disabilities and mental retardation in later life.[7, 8]

It has been recently estimated that in developing nations, 200 million children (roughly 39%) under age five are not reaching their developmental potential because of poverty, malnutrition, high rates of infection, lack of stimulation and education and instability in the home. [9]

According to a recent estimate, 12% to 16% of American children have developmental or behavioral disorders and another study estimated developmental disabilities to affect 17% of children under the age of 17 years. [10, 11]

In this study the prevalence of neurobehavioral developmental delay assessed by GMCD was 48.5% of children and these children were in need of further follow up by the specialist. These findings were similar with studies done in developing countries. [12]

In this study, the gender of the participating children did not influence any of the outcomes. About half the mothers of participated children had received education for less than five years. Poor maternal education is one of the variables most often cited as having a predictive value for poor developmental outcome. [13, 14] Among the fathers, majority had completed minimum 10 years of education. The results of the present study showed that higher education among the parents had a positive effect on child development.

Because development is dynamic in nature and surveillance and screening have limits, periodic screening with a validated instrument should occur so that a problem not detected by surveillance or a single screening can be detected by subsequent screening.

The present study has important implication for early intervention practice in India. The 2001 census gives the total population for the country as 1,028.7 million persons. This population is expected to reach 1,264 million in 2016 which means that approximately 236 million people are likely to be added to India's population in the current and ensuing decades.

Early intervention programs can be particularly valuable when a child is first identified to be at high risk of delayed development, because these programs often provide evaluation services and can offer other services to the child and family even before an evaluation is complete. These services can include developmental therapies, service coordination, social work services, assistance with transportation and related costs, family training, counseling, and home visits.

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