number of primary care physicians and pediatricians are likely to be involved in provision of services under RBSK.

However, it may not be feasible to use INDT-NMI tool at community level with the existing level of skills of District Mobile Health Team and paucity of time due to large number of children (150-200) screened at one or more sites in a single day. Also INDT-NMI has been evaluated in tertiary care settings, where graduate physicians are likely to be better informed and motivated than primary care physicians in the peripheral public health system. Therefore, a pragmatic trial, with INDT-NMI being administered by primary care physicians in field settings with less intense supervision, would provide a realistic assessment of its application and training requirements. The results can be used to advocate its use as the standard diagnostic tool within the national program.

Funding: None; *Competing interest*: None stated.

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Indigenous Diagnostic Tool for Neuromotor Impairments for Primary Care Physician

Pediatric Neurologist's Perspective

JAYASHREE NADKARNI

Department of Pediatrics, Gandhi Medical College and Associated Kamla Nehru and Hamidia Hospital, Bhopal, MP, India.
jayadn2007@gmail.com

Many children who have neuromotor impairments are often seen only in primary care settings. Early identification of motor delays enables timely referral for developmental intervention as well as diagnostic evaluation and treatment. Although parents are reliable in reporting their child's gross motor development, it is up to the primary care physician to use the parent's report and his or her own observations to detect a possible motor delay. A child with suspected neuromotor delay needs referral for early intervention or special education resources. Concurrent referrals to physical and/or occupational therapists should also be initiated [1].

The appropriate use of any standardized screening instrument requires skill and experience in testing as well as familiarity with the specific screening tool used. Despite national efforts to improve developmental screening in the primary care setting, few pediatricians use effective means to screen their patients for developmental problems. Limited availability and access to pediatric neurologists, development pediatricians and therapists in low-resource

countries significantly delays identification of neuromotor impairments [2,3]. It is uncertain whether standardized screening as it is practiced currently, is associated with an increase in the self-reported identification of children with developmental disabilities [4].

To ascertain the frequency of mental disorders in Sudan, Philippines, India, and Colombia, 925 children attending primary health care facilities were studied [5]; rates between 12% and 29% were found. The range of mental disorders diagnosed was similar to that encountered in industrialized countries. The research procedure involved a two-stage screening in which a 10-item reporting questionnaire constituted the first stage. The study showed that mental disorders were common among children attending primary health care facilities in the four developing countries and that accompanying adults (usually the mothers) readily recognized and reported common psychologic and behavioral symptoms when these were solicited by means of a simple set of questions. Despite this, the primary health workers themselves recognized only 10-22% of the patients with mental disorders. The results have been used to design appropriate short training courses in childhood mental disorders for primary health workers in these countries [5].

Unfortunately, traditional primary-care management of pediatric mental disorders is characterized by non-specific counseling, low-dose prescribing, and referrals to specialty settings that are often not completed. Even when a specific neuromotor diagnosis has not been established, children with motor delays benefit from educationally and medically based therapies, possible only when they are picked up early in the community [6].

The American Academy of Pediatrics recommends the use of valid and reliable developmental surveillance and screening instruments through formal protocols for all infants and children in the primary care setting because this practice has been shown to improve accuracy and increase the likelihood that developmental delays will be identified and referrals for services made in a timely fashion [7].

Need for a diagnostic tool for use by primary care physicians in the developing countries has been felt of late. It will considerably increase access to specific care and rehabilitation of children with neuromotor impairments. There is no validated, reliable and comprehensive tool for diagnosing and categorizing neuromotor impairments for children older than 2 years in resource-constrained environments. A national program for screening, diagnosis and treatment of neurodevelopmental disorders (NDD) within primary care settings has been included in the recently launched *Rashtriya Bal Swasthya Karyakram* (RBSK) in India [8].

In this issue of *Indian Pediatrics,* the INCLEN study group has reported development and validation of a diagnostic tool for neuromotor impairment which employs standardized and uniform diagnostic criteria for use in 2-9 year-old children [9]. The tool has three sections consisting of triage questions, observations and the operator conducted neurological examination. Meant to be used by graduate physicians after a structured short training in primary care setting, it has been developed by 55 experts, and the findings put up after applying on 454 children selected through systematic random sampling from Pediatric neurology speciality clinics of 3 tertiary centers in India. The candidate test had good sensitivity and specificity. The performance of this tool needs to be systematically evaluated in primary care settings of different geographic regions and general practice environment for its diagnostic capability. The tool is a simple, valuable aid, based on algorithmic approach for early diagnosis of neuromotor impairments in primary care settings, and for early institution of physiotherapy and referral to a specialist for detailed evaluation.

Funding: None; *Competing interests*: None stated.

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Predictors of Mortality in Neonates with Meconium Aspiration Syndrome

ANTHONY JB EMMERSON
Newborn Intensive Care, St Mary's Hospital, Oxford Road, Manchester, UK.
Anthony.Emmerson@cmft.nhs.uk

Meconium aspiration syndrome (MAS) is a major cause of respiratory difficulty after birth in term and post term infants across both the developing and developed world, and has a significant morbidity and mortality. MAS presents at or just after delivery with marked respiratory distress, hypoxemia, evidence of meconium beneath the vocal cords, and a chest *X*-ray showing hyperinflation, patchy infiltrates and occasional air leaks.

Meconium stained liquor (MSL) is relatively common occurring to 7-22% of all term deliveries [1]. The pathophysiology of the passage of meconium into the amniotic fluid prior to birth remains unclear but is associated with prolonged gestation, infection and hypoxia [2]. Only about 1% of infants born in the presence of MSL will develop MAS [3]. The factors that lead to the development of MAS in the presence of MSL are also not fully elucidated but chronic asphyxia and infection are considered to be the key factors [4]. A mechanism has been suggested whereby hypoxia and infection lead to the passage of meconium, and fetal gasping then leads to meconium aspiration [5]. Aspiration of meconium into the airways results in mechanical obstruction with an increased incidence of air leaks, adverse effects on pulmonary function, including reduced surfactant activity, a chemical pneumonitis and an inflammatory response. Significant respiratory difficulties after birth with sepsis or hypoxia may lead to pulmonary hypertension. Several factors contribute to the severity of MAS leading to a complex multisystem disorder requiring respiratory, cardiovascular, neurological and sepsis management [6].

The cause of death in infants with MAS is multifactorial and, for the neonatologist, predicting the likely causes of death helps target interventions to improve outcome. In this issue of *Indian Pediatrics*, Louis, *et al*. [7] have investigated the predictive factors for mortality after meconium aspiration in a major center of Northern India between 2004 and 2010. MAS was diagnosed when there were respiratory difficulties after birth in the presence of MSL and with a compatible chest *X*-ray. The authors identified a range of additional problems associated with MAS, including chorioamnionitis, persistent pulmonary hypertension of the newborn, hypotensive shock, myocardial dysfunction, hypoxic ischemic encephalo-pathy and renal dysfunction. Most of the diagnoses were made on the basis of clinical parameters and the specific cause was not identified. The authors undertook a retrospective observational study of 170 infants with MAS and identified a high mortality rate of 26% with median time to death of 24 hours. The authors speculate that the cause of the higher mortality rate than in other published data was due to a large number of small-for-gestational age infants. The authors identified that perinatal asphyxia with secondary hypoxic ischemic encephalopathy was associated with MAS in just under 50% of all infants. They reported a statistically significant difference in cord pH, 1 and 5 minute Apgar scores, persistent pulmonary hypertension, hypotensive shock and myocardial dysfunction in those who died.

A statistical prediction model identified that myocardial dysfunction and higher initial oxygen increased the odds of death whilst higher birth weight reduced the risk. The underlying cause for the myocardial dysfunction in conjunction with MAS was not elucidated in this study. The authors acknowledge the limitation that the diagnosis of myocardial dysfunction was made clinically but emphasize that knowledge of this as a risk factor can lead to close cardiovascular monitoring and early vascular support.

The data in this paper are helpful in understanding the predictors of mortality associated with MAS. However, if obstetricians – recognizing the association of perinatal infection, asphyxia and MSL with MAS – deliver at-risk