IAP NDP

IAP Chapter of Neurodevelopmental Pediatrics

From the Editorial Team

It has been a pleasure to receive the overwhelming positive response to our first academic newsletter. Of course the credit goes to the erudite authors who made it an academic feast. This edition has been ready almost in time, and we hope you would receive it in time too. We have largely kept the format for the previous edition except for adding a Grand Rounds section. We are in deep gratitude to the CMC team which made this possible. We are trying to make the articles, at least the main ones centred on a theme. This time its assessment and early intervention. We are hopeful that the readers would be sufficiently interested to send in their responses so we can add a Readers section. The email ID is journaliapndp@gmail.com.

The Editorial Team
www.iapndp.org

Message From Chairperson

Respected Teachers, Seniors and Honourable members of the IAP Chapter of Neuro Developmental Pediatrics,

Greetings and Compliments of the Season!

At the outset, let me wish you a very happy New Year 2017 !

The past year has been very happy for us as well! Thanks to the wisdom and guidance of our Seniors, Dr MKC Nair, Dr S S Kamath, Dr Abraham Paul, Dr Jeeson Unni and many others and the relentless hardwork and dedication of our members, our Chapter has won the Second Prize for the Best Chapter in IAP! Considering that this is the first year since the Childhoood Disability Group became a full Chapter, this is just reward for the untiring efforts of all of you to serve those children and their families who need help more than anyone else! You have taken a speciality which was largely neglected and ignored and placed it at the centre of pediatrics in the country. I salute you!

Among the hundreds of activities done by all of you, a few that one would mention are the submission of the IAP Guidelines on NeuroDevelopmental Disorders to Indian Pediatrics for publication, the successful launch of the Fellowships in Developmental Pediatrics all over the country and the annual National Conference on Developmental Pediatrics NCDP in Mumbai which was attended by over 750 delegates, had a tidy scientific program and made a substantial addition to our treasury! My congratulations to all our members who continue to work with and help lakhs of children and their families all across India, often with poor or no infrastructure but plenty of optimism and an indomitable spirit!

May the tribe prosper!

Dr Samir H Dalwai
MD, DCH,DNB, FCPS, LLB,
Developmental Pediatrician,
Chairperson, IAP Chapter of Neurodevelopmental Pediatrics,
President, IAP Mumbai Branch,
Chairperson, NCDP-EMBICON 2016.

Message From Secretary

Respected Members,

Greetings from the IAP Chapter of Neuro Developmental Pediatrics!

At the onset I wish you all a very Happy Healthy and Prosperous New Year. 2017 brings with it more challenges but more enthusiasm to work for the betterment of children with developmental disorders.

The First News is that the IAP Chapter of Neuro Developmental Pediatrics has been awarded with 2nd Position in the Best Chapter Award Category. As rightly put by our Chairperson, Dr Dalwai, that the selfless dedication and hard work of all members has resulted in this miracle that **in the first year of its existence as a Chapter and no longer a Group) it has been awarded the Second Best Chapter in IAP for 2016!**

I truly attribute this award to our Seniors and Mentors, Dr MKC Nair Sir, Dr SS Kamath, Dr Abraham Paul, Dr Jeeson Unni and Dr Samir Dalwai for their constant support, guidance, and planning of all academic ventures through the year and to All Active Members of the Chapter who are dedicating their precious time for creating awareness on the subject of Neuro Developmental Disorders. This would not have been possible if our senior members did not envision this assemblage of like-minded professionals who could come together to work for children with special needs and help remove the "Dis" and see their 'Abilities". This transformation across the country is being brought about by many members who are working indefatigably and persistently day and night for the betterment of our children.

Dr Chhaya Sambharya Prasad,
National Secretary, IAP - NDP

I take this opportunity to congratulate Dr Samir Dalwai, 'IAP President Mumbai 2016, Chairperson of the Chapter and Organizing Chairperson-NCDP EMBICON 2016' and his Team for successfully conducting the 13th National Conference of the IAP Chapter of Neuro Developmental Pediatrics, a conference which saw a registration of more than 800 delegates which is quite unusual for a National Conference of any Sub Speciality Chapter. The thirst to learn more about child development and neuro developmental disorders has attracted the delegates. Honorable Member of Parliament, Mrs. Supriya Sule, was the Chief Guest and she enthralled all pediatricians with her brilliant words of encouragement and congratulated the IAP Chapter of Neuro Developmental Pediatrics for doing excellent work.

Dr. Samir Dalwai, 'IAP President Mumbai 2016, Chairperson of the Chapter and Organizing Chairperson-NCDP EMBICON 2016' shared its vision and motto "Every Child Can Do Better" through research papers and presentations which showed that a scientific multidisciplinary approach, yields positive results in developing a child's skills. This Annual Conference saw a combination of Best International and National Faculty for the main conference and very interactive educative workshops at different places at Mumbai, namely at NHCDC Mumbai Goregaon, (LTMG) Sion Hospital, and Hinduja Hospital Khar. The workshops were full, rather over registered with last minute entries despite no place to sit.

Stalwarts in the field of Neuro Developmental Disorders such as Dr Pratibha Singhi, Dr Nandini Mundkur, Dr Veena Kalra, Dr Abraham Paul, Dr Jeeson Unni, Dr SS Kamath, Dr Vrajesh Udani, Dr Anaita Hegde, Dr Madhuri Kulkarni, and many others and International Doyens such as Dr Waheeda Pagarkar from UK, Dr Catherine McClain from USA, and Dr Joseph Haddad, from Lebanon enthralled the audience with their brilliant talks.

A standing ovation was given to the three Doyen Ladies in the field of Neuro Developmental Pediatrics Dr Pratibha Singhi, Dr Veena Kalra and Dr Nandini Mundkur for their work with children with special needs.

Brilliant papers were presented by young doctors, psychologists, therapists and educators. Many won the awards and medals. It was truly encouraging for all to see the academic momentum building up during the conference.

Heartiest Congratulations to Dr Samir Dalwai, Dr Bakul Parekh, Dr Anand Shandilya, Dr Rajesh Chokhani, Dr Sushant Mane and Dr Bela and the entire team for doing an amazing job and for conducting an academically remarkable conference, served along with sumptuous food and warm hospitality for all.

The Chapter is successfully running the IAP Fellowship in Developmental and Behavioral Pediatrics at 7 Accredited Centers across the country and we are receiving many mails from pediatricians who are enthusiastically waiting to join the course to learn more about developmental disorders and open Child Development Centres in their home towns to cater to the needs of children with special needs. News of opening seats for new batch 2017-18 will be featured soon on the website www.iapndp.org

I congratulate Dr Santhosh Rajagopal, Chief Editor, for taking the efforts to bring out another brilliant issue of the academic News Bulletin.

My Heartfelt warm wishes to All Seniors and Members of the Chapter for a very successful 2017.

May we all continue to work with passion and dedication towards the single common cause - "For Attaining of Better health for All Children"

In Academic Service

Sincere Regards

Dr Chhaya Prasad

National Secretary, IAP Chapter of Neuro Developmental Pediatrics

9356108559

chhaya_sam@yahoo.co.in

EDITORIAL

Assessing and Intervening

Dr Santhosh Rajagopal - Editor In Chief
MBBS,DCH,PGD-DN,PGD-EPI,FRSPH (UK)

It's not often that one gets the dubious distinction of critiquing one's own work. I have that privilege thanks to an author who reneged from his promise at the last minute. But my article on assessment of global developmental delay is a distillate of the references cited; only some pearls of practical wisdom being mine. Suffice it to say that it directs you I hope, correctly down the path of scientific enquiry. One should not be hesitant in suggesting an expensive investigation if that would mean a difference in the prognosis but, one should not even order a dirt cheap test if it won't move the diagnostic machine an inch. One of my teachers used to say, "Before ordering a test, consider what will you do a, if its positive and b,if it is negative". If both answers are the same, do not do the test. Seems quite simple, but in practice, with an anxious parent and the peer pressure to do 'something', it is not so straightforward. Once you've determined the cause and even before that ,early intervention is the mantra. Developmental Paediatrics should probably be used as a synonym of Early Interventions. I for one, would not grudge the semantics. If the article by my good friend Dr Leena needed an example to showcase the benefits of keeping the hope alive through early intervention and stimulation, the excellent case presented in our new section Grand Rounds by Dr BeenaKoshy and team from CMC Vellore fits the bill to perfection. Neuroplasticity is the raison détre of the Early stimulation strategy. Before we can strategizehowever ,we need diagnosis and in the larger public health context (of which your truly is a humble practitioner) ,we need data. What better than a real school based study to do this?. My respected senior colleague Dr Sivaparakasam has added his own morsel of knowledge by documenting a field level experience in small town Tamilnadu.

Epidemiology of Developmental disorders is getting increasing clarity in India with the development of country specific tools and increasing awareness. The pilot study reinforces our belief that many a child in India is suffering unwantedly form impairments that are eminently amenable to remediation.

Leadership is all about taking a broader view and in the midst of all the pearls of individual wisdom and experience, I have positioned a sweeping look at child welfare authored by our Chairperson and my beloved friend , Samir Dalwai. First published in The Hindu, A City for The Kids is a treatise on child welfare that all administrators should read daily before they retire to bed. Hopefully we have not run out of such kind hearts in our political and technocratic leadership.

Living itself is a kind of belief in a better tomorrow. So let us hope these drops will add up to an ocean of kindness for the children of tomorrow.

LEAD ARTICLE

Approach to Global Developmental Delay

Dr Santhosh Rajagopal - Editor In Chief
MBBS,DCH,PGD-DN,PGD-EPI,FRSPH (UK)

Developmental Paediatrician and Public Health Specialist based in Madurai, currently employed with a UN agency

Terminology in the field of Developmental Paediatrics is a dynamic entity. At various times nomenclatures have changed, to accommodate diagnostic clarity, social mores, political correctness and advances in understanding of the disorder concerned. However the term developmental delay has transcended the trend and continues to be in vogue as a stand in for as yet undiagnosed domain imperfections as well as the favoured label for referral to the Developmental Paediatrician. The irony of the situation is that in most situations the usage is semantically incorrect. The simple reason being that in majority of cases, complete milestones are never subsequently achieved and in many, there is not even an expectation of the delayed realm attaining normalcy.(1)

What is Global Developmental Delay?

The most common differentiator applied in the preliminary evaluation of a child who has not achieved milestones for his chronological age is whether the delay is global or dissociated. In plain English if a child is delayed in all or most domains of development, it's global. If one domain is disproportionately affected or different domains are in disparate state,

it is dissociated delay. The prototype of global delay is Mental retardation.

Definition:

Global developmental delay is disturbance across a variety of developmental domains. It is operationally defined as significant delay, meaning two or more standard deviations lower than the mean on objective norm-referenced age appropriate testing in two or more developmental domains.(1,2)

While in many discussions the term Mental retardation or its recent version Intellectual Disability (3) or the latest Cognitive Impairment is used inter changeably with global developmental delay, they are by no means synonymous. The definition of intellectual impairment has evolved over the years. In the process of making it objective and measurable, the clarity of thought process of the frontline physician has been sacrificed. In fact it is true of most diagnoses now a day that without a ready reckoner, it's a trifle difficult to be accurate. That discussion is not germane to this article. Suffice it to say that the definition that I grew up with, that is:

"*Mental retardation means significantly sub average general intellectual functioning, existing concurrently with deficits in adaptive behaviour and manifested during the developmental period*"

seems a perfectly legitimate way to put in a clinical suspicion of Cognitive impairment. The most recent intervention has to be the ICF model, The International Classification of Functioning, Disability and heath. According to ICF mental retardation is manifested by significant problems in (3)

1. An individual's capacity to perform-(impairment)
2. The ability to perform-(activity limitation)
3. Opportunity to function-(participation restrictions.)

The simple definition that I quoted above itself subsumes several things. One, there has to be an objective IQ testing. Second it should pose challenges in living a normal life.And thirdly it has to occur before the age of 18.

While an IQ testing seems a straightforward exercise it's challenging in the face of cultural differences, inter observer variation and co morbidities like attention deficit and hyperactivity. In general if there is a variation in IQ results, it's prudent to accept the higher value. This might look counter intuitive at first sight but its common sense to understand that a given person might underper form due to environmental or physical issues. It's inconceivable that he or she would perform above what their brain is capable of.

Second of course are defects in adaptive behaviour. It's the most disabling defect since the inability to conform to societal norms is what makes these individuals a perceived misfit.

Evaluation of Global Developmental Delay:

A comprehensive treatise on evaluating a child with global developmental delay is best left to authors of text books. What is presented here is at best a practitioner's guide, and those interested in a more complete discussion are referred to the articles cited in the reference section.

As with any other case the evaluation proceeds along the traditional lines of

1.Detailed history

2. Clinical evaluation

3.Selected laboratory testing.

History:

- Three generation family history with special reference to developmental issues
- Status of consanguinity
- Adverse antenatal events and maternal drug intake or substance abuse
- Adverse perinatal issues like meconium staining, foetal distress, abnormal 5 min APGAR
- Neonatal neurological issues like seizures
- Medical history of the child with special refer-

ence to hospitalizations, surgeries and current medication use.

- Current status of rehabilitation care
- Detailed developmental history across all domains. A Chart might be useful at this stage. The latest TDSC 0-3 year chart would be a perfect complement to one's clinical intuition. It can be completed in the physical examination stage.

Physical Examination:

- Height and weight measurement and plotting in the relevant percentile chart.
- Search for dysmorphological features
- Record neuro-cutaneous markers like café au lait spots.
- Measure occipital- frontal head circumference.
- Look for organomegaly.
- Formal neurological examination starting with cranial nerves and a formal developmental assessment if one is trained. DASII is an excellent if slightly time consuming tool. The Western equivalents especially Bayley Scales have wide acceptability but are costly.

Laboratory Testing:

A metabolic screen is what that comesto one's mind the moment lab investigation is mentioned. There are several issues to this. One is that the labs have no common protocol when it comes to this putative screening. Second is that the protocols prescribed in western literature often assumes a universal new born screen, which is non-existent in most regions in India. More on that later.

If a specific clinical diagnosis is suspected, target the condition. Examples include neuro-imaging for possible intra-partum asphyxia, targeted FISH probe for Prader-Willi or Angelman syndrome,FMR 1 Triplet repeat testing for Fragile X syndrome etc.

What test for a child with no clinical diagnostic label?

It is now evident that in spite of absence of clinical markers ,routine screening of children with global developmental delay/ mental retardation the following tests will reveal an ethology in one sixth of the cases

1.High resolution banding karyotyping

2.FMR1 Triplet testing

3Neuroimaging,preferably MRI.

Metabolic Screeening:

The introduction of New born screening in many realms have reduced the need for this when a developmental delay is diagnosed. The panel shows the candidate disorders for which national screening has been proposed and in many a state already implemented.

Core Diseases(4)
Congenital Hypothyroidism
Congenital Adrenal Hyperplasia
G6 PD Deficiency

Expanded List(5)
Haemoglobin disorders
Cystic Fibrosis
Homocysteneimia
Hyperglycinemia
Maple Syrup Urine Disease
Phenylketonuria

For starters thyroid function tests would suggest itself as a basic minimum measure. It needs to kept in mind also that the incidence of Hypothyroidism among Down Syndrome children is higher than the average. Without a clinical suspicion a metabolic screen ahs very less yield.

Clues for metabolic disorder :

- Prior family history of affected child
- Parental consanguinity
- Documented developmental regression
- Episodic decompensation
- Suggestive Dysmorphology
- Growth failure
- Opthalmic and retinal abnormalities.

What tests?

First level tests would include

- Capillary blood gas
- Lactate , Ammonia
- Liver function studies
- Serum Amino acids
- Urine organic acids
- Serum Carnitine
- Serum VLCFAs

Second level testing would include:

- FISH probes targeting sub-telomeric region of each chromosomes
- Microarray Comparitive genomic hybridisation for CNVs –Copy Number Variations (CMA)

Evoked response, Nerve conduction studies, Electromyograms etc should be used judiciously in the presence of related clinical findings. EEG is better reserved when there is suspicion of a paroxysmal convulsive disorder.

Epilogue:

The clinical evaluation of a child with global delay is by no means an easy task but in the end it is rewarding in terms of the clarity it provides to the multidisciplinary team entrusted with the care of the child. The use of diagnostic tests should be held against the maxim of care and intervention. Is the result going to make a difference in the management of the child or in terms of planning for the next offspring? If the answer is no,the Developmental Paediatrician would be ill advised to embark on a journey of professional satisfaction or diagnostic exhilaration. The ultimate aim of helping the family in distress should never be lost sight of.

Whole Genome Sequencing :

The last few years have seen the Human Genome Project come to a conclusion .The use of Whole Genome Sequencing (WGS) instead of the above mentioned CMA, Chromosomal Microarrray Analysis for genetic analysis has been evaluated. WGS identified genetic variants meeting clinical diagnostic criteria in 34% of cases, representing a fourfold increase in diagnostic rate over CMA (8%; P value=1.42E−05) alone and more than twofold increase in CMA plus targeted gene sequencing (13%; P value=0.0009).(6). These results indicate WGS provides a fourfold increase in molecular diagnosis over CMA alone (8%) and a greater than twofold increase when all genetic testing protocols (>10 tests in some cases) are considered (13%). The cost of WGS is rapidly coming down and could in the near future be affordable to at least the reasonably well healed. While in our country even CMA is not done routinely for developmental delays, there is no reason for us to re-discover the wheel,and we can straight away adopt the WGS as a first line genetic tool.

Vision and Hearing Screening:

Not to be forgotten in the blinding flash of technological advances is the basic requirement of Vision and Hearing screening in developmentally delayed children. Brain stem evoked potentials including BERA, Somatosensory evoked potentials, Visual

REFERENCES:

1. Global developmental Delay and Mental Retardation or Intellectual Disability: Conceptualisation, Evaluation and Etiology, Michael Shevell ,Pediatric Clinics of North America,55(2008) 1071-1084.

2. Practice parameter: Evaluation of the child with global developmental delay Report of the Quality Standards Subcommittee of the American Academy of Neurology and The Practice Committee of the Child Neurology Society, 2003, 60: 376.

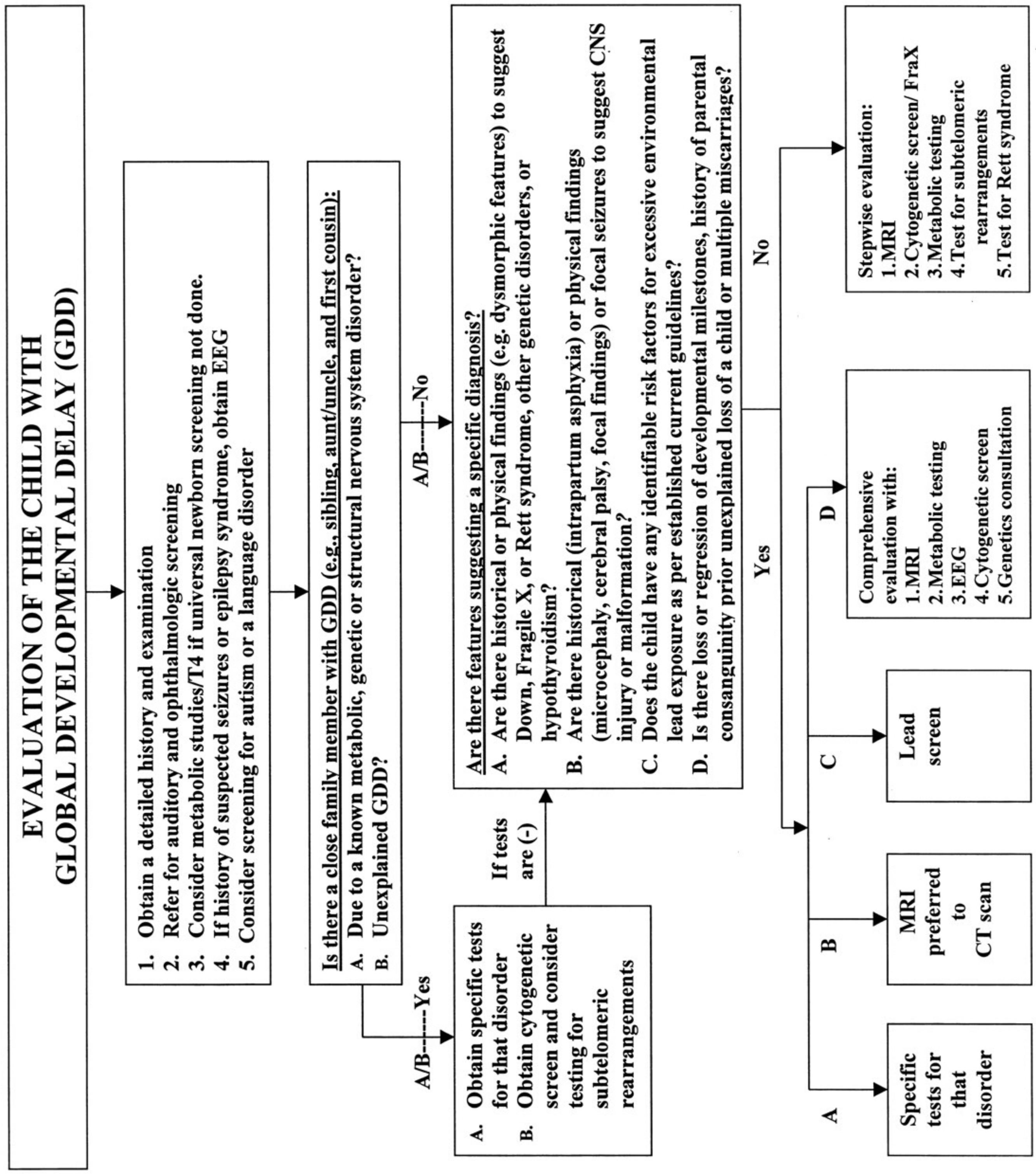
3. SchalockRL, Luckasson RA, Karrie A et al: The renaming of mental retardation: understanding the change to the term Intellectual Disabilty. Intellect.Dev Disabilities,2007;45:116-124

4. National New-born Screening Program – Still a Hype or a Hope Now?, Indian Paediatrics,2013

5. New-born Screening in India: Current Perspectives, Indian Paediatrics 2010.

6. Whole-genome sequencing expands diagnostic utility and improves clinical management in paediatric medicine, Genomic Medicine, Jan 2016.

Note: This article is largely an adaptation of Reference 1 mentioned above. Other contributions are as acknowledged separately.



Flow chart reproduced from Practice parameter: Evaluation of the child with global developmental delay Report of the Quality Standards Subcommittee of the American Academy of Neurology and The Practice Committee of the Child Neurology Society, 2003,60:376

Early intervention – If not now, when?

Early Intervention has become an increasingly discussed concept in the recent years. Developmental experts are stressing on the ever increasing dependance on the primary pediatrician for early identification and thus early intervention in reducing the number and the morbidity in neurodevelopmental disorders.

The health scene in India is changing .With increasing awareness on child development and it's issues parents are more attentive and focussed on their child's optimum development. Along with health care visits one of the essential roles of the primary pediatrician is to support and facilitate the optimal development of the children.

This role would extend to –

Developmental Screening, Surveillance and Stimulation.

The early identification and timely referrals of developmental delays or children at increased biological or environmental risk for developmental delays to early intervention is very much in the hands of the pediatrician. He is at an advantage as he has contact with the child and the family longitudinally for their immunisation visits and an ongoing relation and trust of the family.

To accomplish the same the American Academy of Pediatrics recommendations are-

- ✓ Developmental surveillance at every well child visit,
- ✓ Developmental screening with standardised tools at 9,18 ,24,30 and 48 months.
- ✓ Additional screening as and when parents voice any developmental related concerns.

Dr Leena Srivastava
Developmental Pediatrician & Neurologist
In charge, Child Development & Guidance Clinic,
Bharati Vidyapeeth Medical College & Hospital
Cloud Ninehospital, Pune.

- ✓ Autism specific screening on every child at 18 & 24 months.
- ✓ If screening results are concerning refer for detailed developmentaland medical evaluations along with early intervention services.
- ✓ Follow up on referrals made.

Surveillance pertains to questions related to development at every well child visit. Most health care visits do contain questions regarding motor development but including communication and socio emotional domains in the surveillance is recommended.

Screening involves the administration of a low cost, easily administered standardised tool , the results

of which are then discussed with the parents and further plan for intervention counselled. In busy pediatric practice if using a standardised tool is not feasible (though ideally recommended) then an earlier referral for every case with developmental concerns for a detailed evaluation is a good option.Detailed environmental assessments for psychosocial risk factors are also part of the developmental assessments before planning the therapy plan for the child as these may adversely affect outcomes.

Stimulation -The concept of 'nature' and 'nurture' of development makes it amply clear of the role of a good and stimulating environment for the growing infant and toddler. Stimulation in the form of age appropriate activities and play with a 'language-rich' environment for the child.The paediatricians role in this is providing understanding to parents/ caregivers about normal development & behaviour and promotion of ways of nurturing it, thus preventing parent-child conflicts and increasing bonding with the child. Secure attachment with minimal conflict also contributes to healthy emotional & behavioural patterns of the child.

Most health professionals working with children are not clear however of the cases or disorders in which early intervention plays a role. All of us are familiar with high risk newborn follow up and the importance of intervention in them ;but children with developmental delays or at risk in any of the domains can benefit from interventions individualised for their needs. Motor, communication, socio-emotional, cognitive, adaptive and global delays along with at risk cases for delays like syndromic children, cases of child abuse and neglect (CAN) can benefit from well planned programs of early intervention.

There is enough evidence over the years to tell us that early intervention can have a positive impact on functional outcomes. Recent evidence in fact suggests that for children with mild developmental delays or for those atrisk for developmental delays, intervention at a younger age has been shown toresult in improved long-term developmental trajectory.

Neurobiology: Neuroplasticity & related factors:

Early intervention is based on neuroplasticity of the brain. Cerebral plasticity refers to the brain's ability to learn, remember,forget, reorganize, and recover from injury. The conceptual framework for plasticity was formulated in 1949 by Hebb, who postulated that when one cell excites another repeatedly, a change occurs in one or both cells that contributes to their stability [1]. "neurons that fire together, wire together." Neurogenesis and synaptogenesis comprise the activity-dependent

mechanisms underlying cerebral plasticity. Plasticity is greatest in the developing brain, partly because of the overproduction of neurons in the fetus and the overproduction of synapses during postnatal development [2]. Excess synapses are pruned during childhood and early adolescence, in response to external experience [3]. A threshold level of stimulation may be required for the brain to develop normally during critical periods. Plasticity accounts for a child's superior ability to learn a second language or to recover the ability to walk after radical surgeries, such as a hemispherectomy to treat epilepsy[4]. The idea that a child's brain has more plasticity than an adult brain and can recover more easily from injury is known as the 'Kennard principle'. But gradually it became clear that this is not always true [5]. Many factors determine the consequences of a lesion of the developing brain: the age at insult, the site, and the size of the lesion, its unilateral or bilateral nature, animal species, sex, exposure to chemical substances prior to andafter the insult, and environmentally induced experience. Rodent studies indicated that, in particular, two types of environmental experience are associated with improved outcome: being raised in a complex environment and tactile stimulation at early age [5,6]. Animals with an early lesion of the brain who are raised in a complex environment, including attractive toys and peers, have a significantly better motor and cognitive outcome than lesioned animals brought up in a standard, "boring" laboratory environment. The improved functional outcome is associatedwith increases in brain weight, cortical thickness, and dendritic length. It has been suggested that part of the effect of the complex environment is mediated by increased maternal care in the form of licking and grooming, i.e., early tactile stimulation. Indeed, other studies revealed that tactile stimulation of pups, who acquired an early lesion of the brain, is associated with improved motor and cognitive outcome and increased dendritic spine density, changes that presumably are mediated by increased levels of neurotrophic factors [5].

Early intervention in different scenarios:

The use of early intervention for sensory impairments like visual and hearing loss cannot be overemphasized and the pediatrician has no doubt about the critical periods in the early identification of these for functional rehabilitation.

In addition to these other conditions that benefit are discussed below.

Preterm/High risk follow up and prevention of Cerebral Palsy-

Improvement of perinatal and neonatal care has increased the survival rates globally. Focus has now shifted to 'quality survival'. Perinatal risk factors and turbulent neonatal courses put this group at higher risk for neurodevelopmental disability.In pre term or high risk newborn follow up we have Indian guidelines to guide us on the multidisciplinary follow up .We also agree now that early intervention (early stimulation) for this population should begin in the NICU itself once the neonate is stable.Indian studies have shown that early stimulation therapy was effective at one year. The beneficial effect also persisted at two years,without any additional interventions in the second year.[7] .Meta-analyses of cognitive and motor development at 12 months showed significant improvements favouring the intervention groups. At 24 months, positive effects remained for cognitive scores only. By ages 3 and 5 years, no significant effects remained . Interventions that focus on both the parent-infant relationship and infant development have the greatest impact on cognitive development over the short to medium term.[8,9]

Western literature shows 50–75% of children with CP acquire their lesion between 24weeks PMA and term age. This is the period during which brain development is characterized by a high rate of widespread and complex developmental processes. The rapid changes over time do not only induce age-specific vulnerabilities of the brain, e.g., lesions in the periventricular white matter at early preterm age and lesions in the cortical–subcortical areas around term age, but also induce age-related plasticity. Limited data from developing countries reveals that CP is less often caused by complications associated with preterm birth than in western industrialized countries, and more often by asphyxia and hyperbilirubinaemia at term, and by postnatal infections,suchasmeningitis.Thedifferencesinvolve different etiological mechanisms, a different timing of the lesion and different plastic changes of the brain. In infants developing CP, the early unspecific neurological dysfunction gradually develops into the specific syndrome of CP. This development may take 1–5 years, but in most children the diagnosis can be established by the age of 18–24months [10]. Also, the marked developmental changes of the brain have important implications for the prediction of developmental disorders at early age. The plastic changes may induce a disappearance of dysfunctions present at early age infants grow out of their deficit. The reverse is also possible: children may be virtually free from signs of dysfunction at early age, but grow into a functional deficit with increasing age due to the age-related increase in complexity of neural functions [11].

Autism spectrum disorder (ASD)-

There have been many treatments developed for children with autism, evolving from different philosophies.Theseincludebehavioralinterventions, developmental interventions, and cognitive behavioral interventions. While each program is based on a different philosophy and uses unique intervention strategies, there is also considerable overlap in components of the programs.

Two aspects of intervention that are common to most intervention programs designed for ASDs and have empirical support include the intensity of the program and the age at which children should begin intervention.[12]Dawson and Osterling (1997), based on a reviewof programs for children with autism,report that most programs involve 15 to 25hours of intervention a week. There is alsoempirical evidence that children who enterprograms at younger ages make greatergains than those who enter programs at olderages (Harris &Handleman, 2000; Sheinkopf& Siegel, 1998). These studies generally comparechildren who are older than 4 or 5 years with those younger than 4 or 5 years of age.

Learning disability-

Reading disability(Dyslexia) is a common type of learning disability. It is a well known fact now that there is a connection between the language system and the basic sound structure or phonology to this difficulty. According to findings(Torgesen et al 1999), provision of an evidence-based intervention at an early stage of reading instruction leads to the development of fluent reading.One of the largest imaging study of a reading intervention and the first report of the effects of a reading intervention on fMRI in children by Shaywitz et al that examined not only reading-disabled children who received an experimental reading intervention but also reading-disabled children who did not receive such an intervention offered encouraging results. An intensive evidence-based (phonologic) reading intervention brings about significant and durable changesinbrainorganization,sothatbrainactivation patterns resemble those of typical readers, with the appearance of the left occipitotemporal area and improvement in reading fluency. Implication being that the provision of an evidence-based reading intervention at an early age improves reading fluency and facilitates the development of those neural systems that underlie skilled reading.[13]

These are few of the conditions which we know to benefit from early intervention. A lot more remains to be known in the need for further and better research in this field. In the meanwhile opportunity to pick up early and utilise the resources available for early intervention in our country should be the goal for professionals working with children.

References:

1. Hebb DO. The organization of behavior. New York:Wiley, 1949.
2. Johnston MV, Nishimura A, Harum K, Pekar J, Blue ME.Sculpting the developing brain. AdvPediatr 2001;48:1-38.
3. Johnston MV. Plasticity in the developing brain: Implications for rehabilitation. DevDisabil Res Rev 2009;15:94-101.
4. Laurent-Vannier A, Brugel DG, De Agostini M. Rehabilitation of brain-injured children. Childs NervSyst 2000;16:760-4.
5. KolbM,MychasiukR,MuhammadA,GibbR. Brainplasticityinthe developing brain. *ProgBrainRes* (2013) **207**:35–64.doi:10.1016/B978-0-444-63327- 9.00005-9
6. KolbB,MychasiukR,WilliamsP,GibbR. Brainplasticityandrecovery fromearlycorticalinjury. *DevMedChildNeurol*(2011) **53**(Suppl4):4–8. doi:10.1111/j.1469-8749.2011.04054.x
7. MKC Nair, Elsie Philip et al ;Effect of child development centre model-early stimulation among at-risk babies –*a randomized controlled trial* ;Indian pediatrics,volume 46, supplement, January 2009
8. Benzies et al. Key components of early intervention programs ,For preterm infants and their parents: a Systematic review and meta-analysis, BMC Pregnancy and Childbirth 2013, 13(Suppl 1):S10
9. Spittle A, Orton J, Anderson PJ, Boyd R, Doyle LW;Early developmental intervention programmes provided post hospital discharge to prevent motor and cognitive impairment in preterm infants (Review) 2015 The Cochrane Collaboration.Published by JohnWiley& Sons, Ltd.
10. Smithers-SheedyH,BadawiN,BlairE,CansC,Himmelman nK,KrägelohMannI,etal.Whatconstitutescerebralpalsyint hetwenty-firstcentury? *DevMedChildNeurol*(2014)56:3238. doi:10.1111/dmcn.12262
11. Hadders-AlgraM. odistinctformsofminorneurologicaldysfunction: spectivesemergingfromviewofdataoftheGroningenPerinatal Project. *DevMedChildNeurol*(2002) 44:561–71.doi:10.1111/ j.1469-8749. 2002.tb00330.x
12. Christina M. Corsello, PhD;Early Intervention in Autism,*Infants & Young Children* Vol. 18, No. 2, pp. 74–85c_2005 Lippincott Williams & Wilkins, Inc.
13. Bennett A. Shaywitz, Sally E. Shaywitz et al,Development of Left Occipitotemporal Systems for Skilled Reading in Children After a Phonologically- Based Intervention;Biol Psychiatry 2004;55:926–933.

Neuroplasticity in a boy with bilateral parieto-occipital gliosis but with good preserved visual function

from CMC, Vellore

This section will feature extended case discussions involving a multidisciplinary team about a particular child. We are kick starting the section from CMC,Vellore .

Neuroplasticity in a boy with bilateral parieto-occipital gliosis but with good preserved visual function

Authors

Dr. Beena Koshy MD (Ped), MD (Res,UK), PDFDP[1]

Dr. Krishna Mahathi DNB (Ped)[1]

Dr. Swetha Sara Philip MS (Ophthal)[2]

Dr. Sunithi Mani MD (Radiology)[3]

Dr. Reeba Roshan MSc (Psych)[1]

Dr. Gordon N Dutton MD[4]

[1]Dept of Developmental Paediatrics, Christian Medical College and Hospital, Vellore.

[2] Dept of Ophthalmology, Christian Medical College and Hospital, Vellore.

[3] Dept of Radiology, Christian Medical College and Hospital, Vellore.

[4]Consultant Paediatric Ophthalmologist, Department of Vision Sciences, Glasgow Caledonian University, Cowcaddens Road, Glasgow G4 0BA, UK.

Abstract

Cerebral Visual Impairment (CVI) results when there is damage to the retrochiasmal visual pathways including the visual cortex. We present a child with bilateral parieto-occipital gliosis probably as a sequel to a perinatal event. He presented at 10 years of age with near normal vision including basic functions and functions of ventral and dorsal streams as well as normal visual evoked potentials. This case report highlights the post-lesion neuroplasticity of the visual pathway in children and is the first such report in a child.

What this paper adds

- Post-lesion neuroplasticity of the visual pathway in a child with bilateral parieto-occipital gliosis results in near normal vision

Introduction

Retro-chiasmal visual pathway lesions cause homonymous visual field defects. Bilateral occipital lobe damage results in visual field defects affecting all four quadrants (1) and lack of central vision, (2) similar in nature to loss of vision due to bilateral posterior cerebral artery occlusion in adults. Post-lesion neuroplasticity of the visual pathways probably plays a part in recovery of vision (3). Visual rehabilitation has been claimed to be associated with an increased rate of recovery of vision in adults despite only blind sight at the outset (4). Recovery of brain function due to neuroplasticity is expected to be optimal in children and may also hold true for the visual system in children with cerebral visual impairment whose vision improves (5). We present a child with bilateral parieto-occipital gliosis who has developed almost normal vision albeit mild lower visual field defect, but with learning disability, probably as a sequel to perinatal asphyxia.

Case report

Dr. Krishna Mahathi (Pediatrician): A ten and half year old boy presented to the outpatient services accompanied by his father with concerns of seizures and learning difficulties. The child, the first born to non-consanguineous parents, was born at 36 weeks gestation with a birth weight of 2.25 kg. He did not cry at birth and required specialized neonatal care for 10 days for perinatal asphyxia. He had a delay in attaining his developmental sequences and walked by 2.5 years and talked his first specific bi-syllable by 2 years of age.

At 7 years of age he started having right sided tonic clonic seizures of 1-2 minute duration every 3-4 days, which were partly controlled on a lower than recommended dose of Sodium Valproate. He could run, draw crosses, speak in sentences and was mostly independent in self-care skills. He was studying in grade 1 and had learning difficulties. His parents had no ocular concerns to report on structured history taking (6).

Examination revealed a pleasant and interactive boy with normal height and weight, but with microcephaly. He had ichthyosis of the lower limbs. He was left handed and had mild right hemiparesis. His vision appeared normal, though peripheral visual assessment gave inconsistent results. Systemic examination was otherwise normal.

Case Discussion

Dr. Beena Koshy (Developmental Pediatrician): Child with history of hypoxic ischemic encephalopathy, has mild right hemiparesis, partially controlled seizures, learning needs and visual concerns on examination. Basic evaluation including drug levels, electroencephalogram and Magnetic resonance imaging of Brain were planned. Pediatric ophthalmology opinion was sought. Learning assessment with support was also provided.

Dr. Swetha Sara Philip (Pediatric ophthalmologist): Ophthalmological examination revealed uniocular visual acuities of 6/9 with uncrowded logMAR and 6/12 with crowded logMAR charts with both eyes. He had peripheral lower visual field defects, when assessed by confrontation, and normal contrast and movement perception. Refraction and eye movements were normal. Cerebral visual assessment showed that he had difficulty in handling complex visual scenes, had problems identifying an object against a patterned or cluttered background and impaired visual guidance of hands, legs and body. He knew his letters but when asked to write, he wrote vertically downwards. All these are suggestive of dorsal stream dysfunction. He could recognize faces and name objects but had problems in recognizing and copying shapes suggesting ventral stream dysfunction.

Mrs. Reeba Roshan (Educational Psychologist): On Stanford-Binet intelligence testing (SBIT) his mental age was 4 years and 7.5 months with an intelligence quotient of 44. He was socially better adapted with a social age of 9 year and 8 months on Vineland Social Maturity Scale – Indian adaptation (VSMS). On Grade Level Assessment Device for Children with Learning Problems in Schools (GLADS), he could read and write at Grade I level in his native language, but had poor numerical and mathematical skills for Grade I.

Dr. Sunithi Mani (Pediatric neuro-radiologist): The Magnetic Resonance Imaging of the brain showed bilateral symmetrical parieto-occipital gliosis with gyral thinning, ulegyria and white matter hyperintensities (Figs.1 and 2).

Dr. Krishna Mahathi: Investigations revealed normal blood tests including haemogram, thyroid, hepatic and renal functions and electroencephalogram. He had a normal flash Visual Evoked Potential.

Dr. Beena Koshy: Reviewing investigations' results, anti-epileptic drugs were optimized. Learning bypass strategies including school concession letter were provided. He was initiated on functional training as well. At six-month review, he remained seizure-free.

This young adolescent despite having bilateral occipital gliosis had near-normal vision. His learning difficulties were predominantly academic and his social adaptive skills were better.

Discussion

Vision in humans is a complex mechanism which has evolved over centuries and visual areas occupy a large proportion of the adult brain. Cerebral Visual Impairment results when there is damage to these visual areas including the retrochiasmal visual pathway. Unilateral occipital lobe stroke usually causes congruous homonymous hemianopsias or quadranopsias with or without macular sparing (1). Bilateral altitudinal visual field defects also can be seen with bilateral occipital stroke and in bilateral periventricular white matter pathology (7). Bilateral occipital damage due to stroke results in cerebral blindness in adults and usually results from bilateral occlusion of the posterior cerebral artery (2).

Neuroplasticity is the basis of learning and development in humans and is best demonstrated in children. Homeostatic plasticity consists of both cellular and synaptic plasticity and includes both anatomical and physiological changes (8). Hebb's postulate that "neurons that fire together wire together" underlines the concept of synaptic plasticity, which manifests both Long Term Potentiation (LTP) and Long Term Depression (LTD) (9). The mechanisms underlying the physiological changes in neuroplasticity include changes in the balance of intrinsic excitability and functional inhibition, LTD and LTP and changes in neuronal membrane excitability (8). The anatomical changes include formation, removal and remodeling of dendritic spines, axon terminals and synapses (4). There may be a temporal profile for different mechanisms of homeostatic plasticity and changes in excitability occur prior to changes in inhibition, and development stage may affect functional inhibition more than intrinsic excitability (10). This cortical cellular and synaptic plasticity is the basis of cortical map plasticity seen in both children with cerebral palsy (8) and adults (4).

In early blind subjects, there is an activity dependent plasticity of cortical networks, rewiring visual input into auditory thalamus and auditory cortex and occipital areas, which become reorganized for auditory spatial processing and echolocation (11). There is an ongoing organization of infantile cortex including visual cortex, which is stimulus sensitive (12). Visual experience causes LTP in the primary visual cortex and this experience dependent plasticity through stimulus sensitive response potentiation (SRP) can be exploited to improve vision (13). Though neuroplasticity is evident in adults (4), it has greater potential in children (5). The plasticity is better after early brain damage than at a later age due to the greater facility of a large dysplastic cortex to differentiate functionally and of the thalamo-cortical connections to bypass damaged areas to reach visual cortex (14). Neuroplasticity can result in recovery of vision (3) and as per our knowledge, ours is the first report in a child.

The child in our case report, though having bilateral parieto-occipital gliosis as evidenced by magnetic resonance imaging, has no history or clinical features suggestive of significant visual deficits. He has moderate learning disability, which may have been a sequel to perinatal asphyxia, and which might have caused the cerebral damage also. Considering the perinatal event as the etiology, there has been significant post-insult neuroplasticity of the remaining occipital cortex and thalamo-cortical connections to result in preserved vision. Neonatal hypoglycemia is known to cause occipital lobe involvement (15) and this boy might have had undetected hypoglycemia, precipitated by low birth weight. Neurophysiologic studies like evoked potential can be used to demonstrate brain re-organisation and repair in children with cerebral palsy (8) and the visual evoked potential of this child is normal. It is remarkable that unlike two other children described in the literature with such bilateral posterior parietal pathology this child did not show any manifest features of Balint Syndrome, which is a dorsal stream dysfunction manifesting as simultanagnosia, optic ataxia and oculomotor apraxia (16,17). Our child demonstrates post-lesion neuroplasticity of the visual pathways and visual cortex after perinatal asphyxia resulting in near normal vision including basic functions and functions of the ventral and dorsal streams. Further studies need to explore the full extent of the ophthalmologic manifestations of bilateral parieto-occipital gliosis in children and the possible mechanisms and extent of neuroplasticity in them.

Bibliography

1. Holt LJ, Anderson SF. Bilateral occipital lobe stroke with inferior altitudinal defects. Optometry. 2000 Nov;71(11):690-702.
2. Cappellari M, Tomelleri G, Di Matteo A, Carletti M, Magalini A, Bovi P, et al. Dide-Botcazo syndrome due to bilateral occlusion of posterior cerebral artery. Neurol. Sci. 2010 Feb;31(1):99-101.
3. Sabel BA, Kasten E, Kreutz MR. Recovery of vision after partial visual system injury as a model of postlesion neuroplasticity. Adv Neurol. 1997;73:251-276.
4. Chokron S, Perez C, Obadia M, Gaudry I, Laloum L, Gout O. From blindsight to sight: cognitive rehabilitation of visual field defects. Restor. Neurol. Neurosci. 2008;26(4-5):305-320.
5. Werth R. Cerebral blindness and plasticity of the visual system in children. A review of visual capacities in patients with occipital lesions, hemispherectomy or hydranencephaly. Restor. Neurol. Neurosci. 2008;26(4-5):377-389.
6. Dutton GN, Calvert J, Ibrahim H, MacDonald E,

McCulloch D, MacIntyre-Beon C, Spowart K. Structured clinical history-taking for cognitive and perceptual visual dysfunction and for profound visual disabilities due to damage to the brain in children. In: Visual Impairment in Children due to Damage to the Brain in Children. Eds: Dutton GN & Bax M. Mac Keith Press. London. Pp117-128.

7. Jacobson L, Flodmark O, Martin L. Visual field defects in prematurely born patients with white matter damage of immaturity: a multiple-case study. Acta Ophthalmol Scand. 2006 Jun;84(3):357-362.
8. Kułak W, Sobaniec W, Boćkowski L, Sołowiej E, Smigielska-Kuzia J, Artemowicz B, et al. Neurophysiologic studies of brain plasticity in children with cerebral palsy. Rocz. Akad. Med. Bialymst. 2005;50 Suppl 1:74-77.
9. Le Roux N, Amar M, Fossier P. [Acquiring new information in a neuronal network: from Hebb's concept to homeostatic plasticity]. J. Soc. Biol. 2008;202(2):143-160.
10. Karmarkar UR, Buonomano DV. Different forms of homeostatic plasticity are engaged with distinct temporal profiles. Eur. J. Neurosci. 2006 Mar;23(6):1575-1584.
11. Thaler L, Arnott SR, Goodale MA. Neural correlates of natural human echolocation in early and late blind echolocation experts. PLoS ONE. 2011;6(5):e20162.
12. Dehaene S, Dehaene-Lambertz G. [Cognitive neuro-imaging : phylogenesis and ontogenesis]. Bull. Acad. Natl. Med. 2009 Apr;193(4):883-889.
13. Cooke SF, Bear MF. Visual experience induces long-term potentiation in the primary visual cortex. J. Neurosci. 2010 Dec 1;30(48):16304-16313.
14. Guzzetta A, D'Acunto G, Rose S, Tinelli F, Boyd R, Cioni G. Plasticity of the visual system after early brain damage. Dev Med Child Neurol. 2010 Oct;52(10):891-900.
15. Alkalay AL, Flores-Sarnat L, Sarnat HB, Moser FG, Simmons CF. Brain imaging findings in neonatal hypoglycemia: case report and review of 23 cases. Clin Pediatr (Phila). 2005 Dec;44(9):783-790.
16. Drummond SR, Dutton GN. Simultanagnosia following perinatal hypoxia: a possible pediatric variant of Balint syndrome. J AAPOS. 2007 Oct;11(5):497-498.
17. Gillen JA, Dutton GN. Balint's syndrome in a 10-year-old male. Dev Med Child Neurol. 2003 May;45(5):349-352.

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Legends

Fig.1: Axial T2 flair magnetic resonance image of the brain showing bilateral parietoccipital gliosis with ulegyria, gyral thinning and white matter hyperintensities.

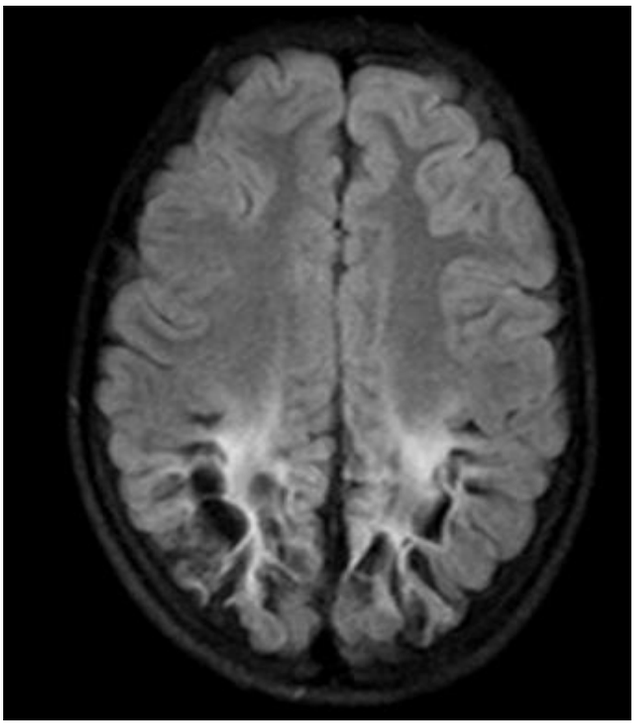

Fig.2: Sagittal T1 weighted image of the brain showing posterior parieto-occipital encephalomalacia.

Pilot study to identify dyslexia among school children

Dr. V.Sivaprakasam

MD.DCH, PGDN,PGD-AP,

FIAP ,President IAP TN2012',CIAP EB 2014, 2015 Consultant Paediatrician, Nataraja Children's Hospital &Nataraja Child Development Center, Chidambaram, Tamilnadu.

Introduction:

Learning Disability particularly Dyslexia is common among school children with the prevalence of 5 -10%. It needs to be identified at the age of 7, so that early intervention and remedial measures can be started to get a good outcome.

When to suspect Specific Learning Disability?

The following is an list of pointers ,by no means exhaustive,which warrant a formal screening for presence of SpLD.

- An Intelligent Child who fails in a class
- Normal or Above Normal IQ 100-140%
- Not performing well in School
- Dislike reading, read slowly, skips words ,sentences,
- Reversal tendency---- was-saw
- Writing slowly- Poor Hand-writing
- Lot of Spelling and Grammar mistakes
- Poor in Mathematics, Algebra

What is Specific Learning Disability?

Specific Learning Disability is a group of neuro-developmental disorder manifesting as persistent difficulty in learning to efficiently read (dyslexia), write (dysgraphia) and perform mathematical calculations (dyscalculia) despite normal intelligence conventional schooling, intact hearing and vision, adequate motivation and socio-cultural opportunity.

SpLD is a group of neuro-developmental disorders manifesting as persistent difficulty in learning to efficiently read (dyslexia), write (dysgraphia) and perform mathematical calculations (dyscalculia) despite normal intelligence conventional schooling, intact hearing and vision, adequate motivation and socio-cultural opportunity.

What else can cause difficulties in learning?

There can be umpteen resons for a child not performing well at school.It is important that these reasons are considered in the differential before a diagnosis of Sp LD is rendered.These include the following.

- Vision problems
- Hearing problems
- Chronic medical conditions
- ADHD
- Psychological Problems
- Mental retardation
- Slow Learners(that's those children with a lower IQ but not enough impairment to be classified as Cognitively impaired /MR)
- Adverse Home environment
- Adverse School environment

Why screen?

Sp LD has an almost across the globe incidence of 10 % of school going population. Once it is found out at least by 7 years,its eminently amenable to remedial education .The sheer number of the children involved and the impact an efficient remediation can have on them makes screening for Sp LD an important public health issue.

The Project:

It is a Pilot project for a unique goal to identify all the children with Dyslexia in our nation and provide free remedial measures. It was carried out in the district of Chidambaram in Tamilnadu. The aimsof the project were.

- To identify children with learning problems among school children, through training of teachers.
- To Screen them to find the cause of learningdifficulty.
- To find out the prevalence of Dyslexia in elementary school children in rural areas.

Methodology:

Thirty teachers from thirty schools were trained to identify academic backwardness in terms of scores less than tenth centile. They were also trained in the tell-tale signs of SpLD .Following this they screened 3200 school children below the age of seven. 160 children thus identified were screened at a teaching hospital by Paediatricians trained in SpLD. The results are summarised in the table below.

Problem	No of Childre n	Percent age
Dyslexia SLD	89	56%
Slow learners	20	12%
ADHD	5	3%
Mild MR	40	25%
Vision problem	3	2%
Hearing Problem	3	2%
Total	160	100%

As can be seen from the table, incidence of Sp LD is 2.78% of the screened population. The overall incidence of academic backwardness was 5 % (n=160). Among children with academic backwardness, Sp LD accounted for as much as 56% (n=89) of the incidence.Mild MR and Slow learners accounted for as much as 37% of the scholastic underachievers.

Follow Up:

Training of 15 Teachers from the same schools on Remedial Teaching are under progress since it was felt that that was the most appropriate short term strategy. However 8 remedial centres have been proposed to the government, one centre for 4 schools,2 teachers in each centre .Remedial teaching can planned in these centres for 89 dyslexic children identified. It will be a permanent centre for the future. Cognitively impaired (MR) children were referred to a School for Differently abled children for free special education.

Conclusion:

- Dyslexia is a manageable neurodevelopment problem which requires early identification.
- Teachers as nation builders can play a major role in identifying this problem if we train them to identify it.
- LD centre in Medical college helps to screen them
- Training of the same school teachers on remedial teaching and starting one remedial centre for 4 schools is a easy way to solve the problem.
- The same model can be fallowed in all the districts of our Country to make India a Dyslexia free Nation

Pic 1:Teachers Training programme

Pic 2 : Assessment at Medical College

Pic 3: Vision screening

Pic 4 Hearing screening

Pic 5 LD screening

Pic 6 : IQ assessment

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A city for the kids

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From adequate healthcare facilities to equal educational opportunities, or involving children in decisions about their city, Mumbai has a great distance to cover.

Dr Samir H Dalwai
MD, DCH,DNB, FCPS, LLB,

As a paediatrician in Mumbai, I would see children coming from a slum to the municipal hospital I worked in, having had no vaccination, and not having eaten a square meal a day. I would see children brought in from the street with no family or guardian. And elsewhere, I would see a child born to a billionaire whose bare feet have probably never touched the soil.

Mumbai's children are a study in contrast: stark at the ends and a million hues in between. It is home to some of the world's richest children and millions of those who may not be assured of their next meal. Forty per cent of them live in slums while others live in plush apartments or bungalows, in one-room tenements with large families, or on the street. The vast spectrum of children and the situation they inhabit is mind-boggling.

But this is just a reflection of the Maximum City, one of the most fascinating — and peculiar — places in the world. Mumbai is a vast swathe of humanity, with a population of more than 12 million living in a small area of 603 sq. km., with 21,000 people thrown together per sq. km.

As a city largely built in reclaimed land, we have only a small ethnic population and humongous influx of immigrants; Mumbai poses its own set of problems for children. These problems can be looked at across two areas: infrastructure and child and adolescent development.

Let's start with how a child comes to birth here and how she goes through life in the city.

Where are our children born?

A tiny fraction of Mumbai's children are born in seven-star hospitals, the large middle section in small-to-medium-sized nursing homes, and a much larger number in poorlyequipped municipal hospitals. There is a need to standardise the facilities and care all new-borns get. We must ensure a minimum of focused ante-natal care, adequate nutrition, safe and hygienic labour and birthing, an immediate breastfeeding initiative and close observation for the new-born's behaviour and feeding for the next two days. We must reserve excellent care for those at high risk, like premature babies, low-birth-weight babies, babies with birth asphyxia or anomalies. A simple add-on to what we already do could help: checklists, which have proven to ensure compatibility with norms. Evidence shows this results in better outcomes.

Where do they go for routine health care and vaccinations?

Parents should be encouraged to follow up with the child at a suitable facility close by. There are government facilities as well as a wide range of private health providers; though parents may choose what they can afford, the government must ensure minimum coverage for all kids. This must ensure regular 'well baby' visits every month for the first three months, then every three months for the first year and every six months for the second year. Again, a checklist for normal growth- and development-monitoring, nutrition advice and immunisation is the norm. This doesn't require any expensive equipment, just due diligence and a mandated referral. It can nip many problems in the bud and the child starts off on a healthy note.

Where do they live?

As a society and a nation, we must aim for safe and hygienic housing for all, though it may be a challenge at the moment. To bypass this, we need to educate people on how they can contribute to their own physical and mental health with their own actions. Emerging economies like Brazil and Mexico have succeeded in doing this to a certain extent. Local self-governments and non-governmental organisations specialising in urban housing can spearhead this. Poor indoor hygiene, including smoking, can contribute as much to infections and allergies like asthma as much as dirt and pollution outside. A case in point is the awareness drive against water stagnation inside the house to prevent mosquito-borne malaria and dengue. Similarly, simple and cost-effective measures for clean drinking water, like rainwater harvesting, have to be adopted.

Mental health and safety, while worthy topics on their own, are closely tied to where we live.

The equation between mental health and housing is an interesting one. Living in plush high rises and not letting your child know your neighbours may be worse than living in a slum: children from a slum often show higher emotional intelligence thanks to the need to interact for survival. Related to this, our safety often depends on the networks we establish, so whether we live in towers or in housing societies or small tenements, our children's safety depends on the degree to which the local community is integrated. Having a local 24- hour helpline where children may call for anything that troubles them is important. We must also do more to increase awareness of the nationwide 1098 children's helpline. And we must encourage children to approach the police for help: we often get our kids to fear the cops; it is necessary to get them to look at the police as friends.

What and where do they eat?

Where do kids eat outside of home and school? Are there designated children food areas or fairs? (I'm not talking about food courts!) Can we encourage restaurants to have children's menus, child-friendly seating arrangements, a small play area for young kids, a room for mothers to nurse? These are things the state, civil society and entrepreneurs can collaborate on.

What is the social structure?

The government may leave personal care to families. However, children without families and in disadvantaged circumstances are in special need of care and attention. Not only does this enhance the human content but it also leads to a fair and just society. The city is in urgent need of closely-monitored institutions — perhaps on a public-private partnership model — that can not only ensure disadvantaged children's physical wellbeing, but also their emotional and intellectual progress.

What is the stimulation? Where do they play?

While we keep lamenting the lack of open space in Mumbai, the solution is to deal with the challenge intelligently. Gully cricket has always thrived in India, beaches were the cradle of cricket and other games in the West Indies. England, which has the largest number of cricket and football pitches, is not necessarily the best in these games.

We need to maximise available spaces. Schools could adopt a ground and nurse it by sharing the costs with the administration. Each school could get one day a week by rotation. The important thing is to put your kids on the field and more importantly, to encourage sports or at least make it seem as important as academics.

Related to this, but not completely overlapping, we must also ask, what is the sports and fitness training available?

One needs to just surf the Internet to see the variety of options available for sports and fitness. However, not even the few who can afford it reach for it. The reason is the lack of a fitness culture. We have an academic culture, a social culture and even a financial culture. We need to develop a fitness culture that will make our kids want to climb the stairs rather than take the elevator.

The very architecture of the city's public spaces can encourage more fitness. It's not just the city government's responsibility — though yes, they must pay more attention to better footpaths, designated cycling or jogging lanes or tracks — we as citizens must also be involved. We could pay more attention to footpath encroachments and work with local bodies to ensure they stay usable, for instance. We could organise more events and competitions that promote and celebrate this culture.

What is the opportunity for intellectual training?

I refuse to believe any city can be more stimulating than Mumbai. The problem is, we are focused on keeping our kids out of things rather than helping them understand and learn from things. Be it religious events, local festivals, political rallies, street theatre, local customs and food, all these constitute the local flavour and you can't love your city if you are unaware of these. Parents, teachers and guardians need to be ready and available to help kids to interpret and deal with them.

Similarly, it's not possible that your kid would have been raised in Mumbai and never seen a person under the influence of alcohol or someone smoking weed, sniffing glue, or snuggling up to a lover in a cab or auto. You can't brush these things under a carpet or wish your kid won't see them. Every time you counsel your kid, you are basically helping her think of the pros and the cons, in a controlled, non-threatening manner. A mentor is more import than a monitor.

Also, when we were young, there were enough classes or places where kids could learn and enjoy art, music and dance. If these are dwindling, it's not for lack of anything except time and inclination, both for parents and children. Parents are busy with their chores, while kids are expected to be nerds. Here again a sea change is needed in perspective rather than any defining infrastructure.

What are their schools like?

Mumbai could be regarded as a hub of education, but again that's only for a particular class of children. The state of education in government-

run schools is, sadly, dismal. The way to make these schools child-friendly is for public private partnerships, or initiatives like Teach For India. A simple solution is for parents to adopt or mentor one child in addition to their own, perhaps the child of an employee or a street child. Mentoring does not mean a financial burden; just sharing resources or even a few words of guidance can be exemplary. In addition to mainstream education, there is scope for improvement in educational support for challenged and gifted children. In a city that prides itself on achievements and success, the mind-set is against accepting someone who may be different. Having recognised that a child has special needs, it devolves on society as a whole to provide for it.

Inclusion is not only about hearing aids and ramps, which of course the government is mandated to provide, but it's about our attitude as a city. Inclusion is about being equally accepting of all differences, whether it's to do with your own child who tops her school and wants to study the fine arts rather than run your nursing home or chartered accountancy practice as much as it is about the neighbour's kid who has learning difficulties in spite of being born to IITian parents. In a way, it's being fine with Bombay and not insisting on it being called Mumbai. Historically, this has been the spirit of this city.

What do kids do during their holidays?

It's true that kids would need more opportunities to play outdoors during holidays but a child-friendly city would also have opportunities to make friends, learn new things, see parts of the city not seen before. Though we may not recognise or respect it, Mumbai is a veritable treasure house of heritage and history. It's essential in a child-friendly city to allow its children to be acquainted with these, so they learn to care for them as adults.

Schools and colleges could organise heritage walks for their students. How about asking them to do projects on their city? How about local self-improvement group training and getting older kids to manage traffic outside the school or services like filling in forms at offices or working with a senior citizens group?

What is the transport?

Not much of Mumbai's transport is child-friendly. There are designated seats for children, but this needs to be done more uniformly. Safety during travel and immediate attention and help during crisis is essential.

What are the opportunities for citizenship training and participation?

This brings us to the most crucial agenda. All across the world, cities are being made childfriendly so as to make the city leaders, the city councillors and mayors more connected, engaged and accountable for their cities.

I was amazed to read about 'Our Journey Together: Strategic priorities for Young People in Bristol', a youth conference in Bristol in January 2016. This symposium was designed to bring together a wide range of people from different backgrounds (from play, youth work, research, health, the arts, urbanism, community work, education, grassroots activism), and ages (around 20 children aged 9–14 years). All of them shared thoughts and experience and contributed to the beginnings of a vision for Bristol's future as a more child-friendly city.

A child-friendly city is most likely to make its future better. And this can start by giving children an opportunity to voice what they want in their city. Hearing young people, listening to their opinions, giving them a say, however small, in how their want their city to be, will most likely result in their participation in caring for it in childhood as well as the future. Giving them responsibility and training to deal with the underprivileged and the disadvantaged is the best way to create an attitude of inclusion in these future city leaders. Setting up a city child council or a local area child council will foster a sense of enjoyment, participation, responsibility and accountability. Making a city child-friendly by invoking children's participation is the best we can do for our future.

The name Mumbai, one school of thought says, is an amalgamation of Mumbadevi, the goddess, and aai, the mother. This city is indeed mother to us all. Making it child-friendly will help our children develop better and eventually, to take care of their mother, the city, once they grow up.

About the author

The author is a developmental pediatrician who has founded New Horizons Child Development Centre and Research Foundation that works closely with children and communities for their development. He is a Law graduate and works on the Expert Committee of the Maharashtra Protection of Child Rights. He is also the President of the Mumbai branch of the Indian Academy of Pediatrics. More

Activities

This month in Odisha, our chapter did 2 activities on 17th and 18th December.

On 17th, we had a CME on Neurodevelopmental Disorders for the DEIC Medical Officer, in Association with NHM at Capital Hospital, Bhubaneswar. As most of the DEIC Officers are Retired medical officers, who have no orientation with these disorders, this program was organised after discussion with NHM Consultatnt Dr Aditya Mohapatra, There were 25 DEIC Medical Officers, coming from different Districts, attended the prog.

The Faculties were:
1. Dr Mahesh Prasad Mohanta
2. Dr Swarnalata Das
3. Dr. Debasis Panigrahi
4. Dr Subrat Majhi
5. Dr. Suravi Patra
6. Mr Prayas Rath (Physiotherapist)
7. Dr Pravin Mahapatra
8. Dr Rajib Ray

On 18th we organised a CME on Developmental disorders for Interns and Pediatric PG Students at HiTech Medical College, Bhubaneswar . This was done in association with the PG Department of Hitech Medical College. The aim was to develop interest in developmental pediatrics among youngsters. 63 interns and 12 PG students attended this program.

Faculties were
1. Dr Gadadhar Sarangi
2. Dr Radha Tripathy
3. Dr Vidya Patwari
4. Dr Rajib Ray
5. Dr Debasis Panigrahi
6. Dr Swranlata Das
7. Dr Subrat Majhi
8. Dr Gopabandhu Nanda
9. Dr Prasant Saboth

Activities

Organised by:

Dr. Mahesh Prasad Mohanta, MD(Pediatrics)
Clinic Nua Sakala,
Goudanibeda, Dhurpada
Near Kumar Automobiles,
Keonjhar, Odisha 758013 (INDIA)
Honorary Asst Prof Pediatrics, Hitech Medical College, Bhubaneswar,
State Co-ordinator (Odisha) for Neurodevelopmental Chapter of IAP
Honorary Secretary IMA, Keonjhar branch
Honorary Secretary, IAP Keonjhar Branch

National Conference at Mumbai - EMBICON-2016

A l b u m

Dr. Y. K. Ambedkar Eminent Senior Pediatrician and Teacher, Medical Director, Bai Jerbai Wadia Hospital For Children, Mumbai

Dr. Samir Dalwai, President Indian Academy of Pediatrics (Iap) Mumbai, National Chairperson, IAP Chapter of Neurodevelopmental Pediatrics, Organizing Chairperson, NCDP EMBICON 2016, Founder Director, New Horizons Group

(Left-Right) Dr. Anjan Bhattacharya Pediatrician, Dr. S.S. Kamath, Eminent Senior Pediatrician, Dr. Manoj Bhatawdekar, Senior Psychiatrist, Dr. Catherine McClain

Honourable Member of Parliament, Ms. Supriya Sule as Chief Guest at Ncdp Embicon, 2016 Felicitated By Dr. Samir Dalwal, President, Indian Academy of Pediatrics, Mumbai, Organizing Chairperson, National Conference of Developmental Pediatrics Ncdp Embicon, 2016 (Right) And Dr. Bakul Parekh, President, Indian Academy of Pediatrics, Navi Mumbai (Left)

Dr. Samir Dalwai with our mentors Dr. Y. K. Amdekar (Centre) and Dr. Rashid Merchant, Eminent Senior Pediatrician and Teacher, Mumbai (Left)

Dr. Waheeda Pagarkar
Consultant in Pediatrics Audio-Vestibular Medicine, London and New Horizons Audiology Centre (NHA), Mumbai

Dr. Abraham Paul (Right) Consultant Pediatrician, Convener, Newborn Hearing Screening Programme, IAP, Kerala,, WHO Lead Expert, New Born Hearing Screening Programme, South East Asia Region Dr. Samir Dalwai (Left)

Dr. Pratibha Singhal Senior Pediatric Neurologist, Head- Pediatric Medicine, Postgraduate Institute of Medical Education and Research, Chandigarh

Dr Veena Kalra
Senior Pediatric Neurologist And Pediatrician, Delhi

Dr Nandini Mundkur
Senior Development Pediatrician
Bangalore

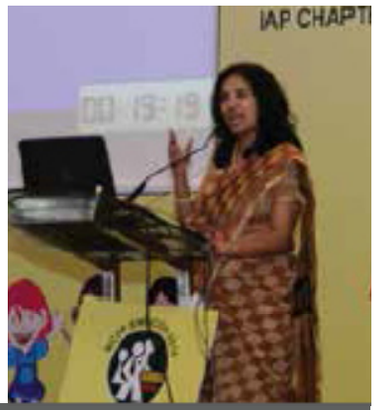
Dr. Anuradha Sovani
Professor and Head-Department of Psychology, SNDT Women's University, Mumbai

Dr. Jeeson Unni
Senior Pediatrician, Kerala

Dr. Vrajesh Udani
Senior Pediatric Neurologist, Mumbai

Dr Anaita Hegde
Senior Pediatric Neurologist, Mumbai

Dr. Chhaya Prasad
Development Pediatrician,
National Secretary, IAP Chapter of Neurodevelopmental Pediatrics



Dr. Leena Deshpande
Consultant Developmental Pediatrician, Mumbai

Wing Commander Dr. Kanwaljit Multani
Consultant Pediatrician

Ms. Deepti Kanade-Modak
Clinical Psychologist and In-Charge,
New Horizons Health and Research
Foundation

Dr. Pramod Jog
President Indian Academy of Pediatrics

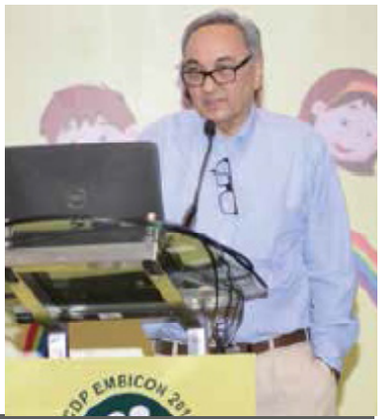
Dr Rajesh Chokhani
Consultant Pediatrician, Mumbai

Dr. Atul Bhaskar
Pediatric Orthopedic Surgeon, Mumbai

Dr. Abraham Paul
Consultant Pediatrician, Convener,
Newborn Hearing Screening
Programme, IAP, Kerala,, WHO Lead
Expert, New Born Hearing Screening
Programme, South East Asia Region

Dr Anand Shandilya
Senior Pediatrician and Scientific
Committee Chairperson, NCDP
EMBICON, 2016

Dr. K. N. Shah
Eminent Senior Pediatrician and
Professor Emeritus



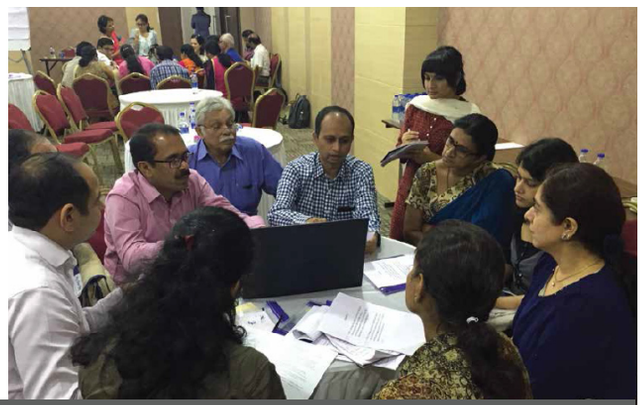
Dr. Rashid Merchant,
Eminent Senior Pediatrician and
Teacher, Mumbai

Dr. Waheeda Pagarkar Consultant in Pediatrics Audio-Vestibular Medicine, London and New Horizons Audiology Centre (NHA), Mumbai

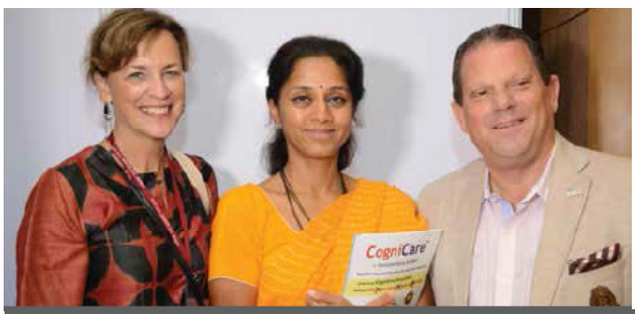
Dr. Neela Shabde Senior Pediatrician, Former Clinical Director at National Health Services (NHS), Cumbria Clinical Commissioning Group, UK

Dr. Catherine Mcclain Professor Emeritus Former Director, Center For Development and Disability, University of New Mexico, USA

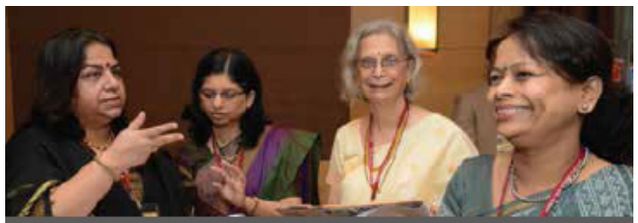
Judges of The Oral Presentation, Dr. Neela Shabde (Left) And Dr. Leena Srivastava (Right)



Group Activity with Delegates at The Pre-Conference Workshop



(Left-Right) Dr. Catherine Mcclain, Ms. Supriya Sule and Dr. Joseph Hadded, Professor of Pediatrics and Neonatology, Berirut, Lebanon



Organization team for research papers Dr. Varsha Phadke (second from left), Dr. Sushma Save (extreme right) and judges for Poster Presentation Dr. Madhuri Kulkarni (third from left) and Dr. Radha Ghildiyal (first from left)

House Full Delegates At The 13th National Conference of Developmental Pediatrics (NCDP) And 18th EMBICON, 2016

New Horizons Presenters for Oral Paper Presentation Category with Dr. Ameya Bondre, Project Coordinator, New Horizons Health and Research Foundation

Dr. Bansari Bholte, co-author of winning poster accepting the certificate

Ten Poster Presentation By Team New Horizons

Dr Mamta Manglani

Doyens of Disability Group Dr Pratibha Singhi, Dr Veena Kalra, Dr Nandini Mundkur

Valedictory

Workshop On Developmental Screening Tools at Sion

Huge Audience

National Conference at Mumbai - EMBICON-2016

Launch of First Volume of Neurodevelopmental Pediatrics Newsletter at Embicon - Mumbai 2016