DPT

DEVELOPMENTAL PEDIATRICS TODAY

January 2023

Monthly e-Newsletter of IAP Chapter of Neurodevelopmental Pediatrics

Inside

Editorial

Respected Seniors and Dear Friends,

Greetings from Neurodevelopmental Chapter of IAP!

Wish you all a very happy and healthy 2023.

There is a change of leadership at the CIAP. We wholeheartedly welcome the new team lead by Dr.Upendra Kinjawadekar and hope to get full support for our ventures. We appreciate and thank Dr. Remesh Kumar for his guidance and support during his tenure.

As far as some important days are considered, 4th January is World Braille Day and 18th January is National Immunization Day (Polio). January is Birth defects prevention month and Thyroid awareness month.

World Braille Day is a time to celebrate the contributions of Louis Braille and to raise awareness about the importance of literacy and education for people who are blind or visually impaired. It is also a time to recognize the many advances in assistive technology that have made it easier for people with visual impairments to access information and communicate with others. These advances include the development of braille displays, screen readers, and other software that allows people to access computers and the internet using braille or speech.There is a writeup on Braille in this issue.

India reported its last polio case from district Howrah, West Bengal on 13th January, 2011. WHO on 24th February 2012 removed India from the list of "endemic countries with active polio virus transmission"

In India, more than 1.7 million children are born with birth defects every year. The term 'birth defect' encompasses a diversity of health conditions including physical malformations such as cleft lip or palate, chromosomal abnormalities such as Down syndrome, functional defects including sensory deficits such as congenital deafness. Some birth defects are externally visible, while some are not and require other diagnostic methods. Birth Defects have been recognized globally as a major contributor to neonatal and infant mortality and disability. Being aware of the impact of birth defects on our future generation and implementing a strategy for their prevention, early identification and management is therefore of utmost importance.

Although congenital anomalies may be the result of one or more genetic, infectious, nutritional or environmental factors, it is often difficult to identify the exact causes. Some congenital anomalies can be prevented. Vaccination, adequate intake of folic acid or iodine through fortification of staple foods or supplementation, and adequate antenatal care are examples of prevention methods.

Awareness about Thyroid screening is very important since it is a preventable and treatable cause of developmental delay.

Long live IAP and Neurodevelopmental Chapter!

Dr. Lata Bhat
Chief Editor

Chairperson's Message

Dear Readers,

Greetings and glad tidings for the new year from Neurodevelopment Pediatric Chapter of IAP.

It is very heartening to see the performance of the Chapter members over the last few years. There have been concerted efforts in creating awareness of prevention, care and better understanding of the neurodevelopmental problems. Some of the leading pediatricians of the country have been honoured for their work. I on behalf of the Chapter would like to congratulate Dr P Hanumantha Rao, SWEEKAR Multispeciality Rehabilitation Center, Hyderabad, on being conferred the Padma Shree award this January for his outstanding contribution to the quality of care of Neurodevelopmental problems in children.

Another stalwart from our chapter Dr Nandini Mundkur, Director CCDD, Bengaluru, received accolades from the IAP Bangalore Pediatric Society on 23 January for her contribution in the field of neurodevelopment. Certainly these awards stand as an inspiration to all of us and to the younger generation. Selfless and concerted efforts in any work have their dividends.

Let us start the new year with renewed vigour and new ideas keeping pediatricians in the pivotal role . Surveillance and Screening for delays and deviance is a trump card in catching problems during the widow period of development. Let us all keep an eye on that.

This newsletter comes as a reminder of the days and months devoted to the cause of specific disabilities. This month is on care of vision and its support, along with prevention of birth defects.

Do enjoy going through the activities done by some of our members. We express our gratitude to them and remember to keep us informed of your good work.

Happy reading!

Regards

Dr. Shabina Ahmed MD, FIAP
National Chairperson
Neurodevelopmental Pediatrics Chapter of IAP

Snippets from the Secretary

Dear seniors and friends,

Seasons greetings from the IAP Chapter of Neurodevelopmental Pediatrics. Wishing you and your families a happy, healthy & prosperous 2023!

The year also saw a change in guard at the central IAP with the new team of Dr Upendra Kinjawadekar taking over as IAP president from Dr Remesh Kumar. I take this opportunity to thank Dr Remesh Kumar for the guidance and support to the chapter throughout the year and look forward to working under the able guidance of Dr Upendra Kinjawadekar in the year ahead.

The chapter has been adjudged the best chapter for the year 2022 and this feat wouldn't have been possible without the hard work of all the chapter members in their respective zones as well as the efforts of past office bearers.

As we look back to the year gone by, we see a lot of hard work at all fronts from all chapter members in their respective areas which has worked well in seeing us perform at various levels. Dr Hanumantha Rao, one of chapters senior members, was awarded Padamshri on 26 Jan 2023 by the Government of India for his contributions over the last four decades in the field of child development and is a shining role model/example for all of us in the chapter. The PEDICON 2023 scheduled at Gandhinagar Gujrat in February will see International and National paediatricians coming together and sharing information.

January month has many important health days like Birth defects prevention month, thyroid awareness month. We have some interesting articles and journal scan related to these topics. Happy reading…….

Long live IAP,

Jai Hind!

Wg Cdr (Dr) KS Multani
National Secretary
IAP Chapter of Neurodevelopmental Paediatrics

PADAMSHRI DR P HANUMANTHA RAO

Dr. Pasupuleti Hanumantha Rao, M.D.(Ped), Ph.D.(Psychology),CPM & R (Bom), DN,FICP,FICA(USA), is an internationally-known specialist in Developmental Paediatrics, Rehabilitation Medicine & Psychology. He is a practicing paediatrician, rehabilitation Specialist and Founder – Chairman of Sweekaar Academy of Rehabilitation Sciences at Hyderabad, Telangana. He was born at Hyderabad in 1945 in a family of Doctors. After completing MD Pediatrics in 1975 he was not satisfied with routine practice and had a great inner urge to serve the forgotten section of the society - the Divyangjans. In 1975 there were hardly any facilities to serve the disabled. Refusing the Govt. job which was very sought after those days and leaving his lucrative practice he went to Bombay and had special training in Rehabilitation medicine at All India Institute of Physical Medicine and Rehabilitation and completed and completed Ph.D in Rehabilitation psychology. He founded a special school for the intellectually impaired children in the year 1977. This was located in his garage with 5 children and 2 special teachers, with the name "The Hyderabad Special School for Children in need of Special care". As the services expanded, in order to increase the awareness about the disability and include other services, the name was changed to "Sweekaar Academy of Rehabilitation Sciences". He then went on to establish the services on 1acre land from GOI. He also founded the "Special school for the Deaf & junior college" in year. Till date 745 hearing impaired persons have been employed in Govt.Sector and 672 in the private sector. Realizing the great shortage of trained manpower to provide rehabilitation services he introduced two diploma courses in Special education in 1986 which later expanded to 30 training programmes producing 8071 professionals across Diploma, UG, PG, Post PGs in Special Education, Speech & Audiology & Clinical Psychology, including Doctorate in Clinical Psychology affiliated to OU and RCI,GOI. Dr. Hanumantha Rao as a Visionary & Missionary is providing service to all types of Disabled under one roof, for all age groups and service by all types of specialists established one stop service center, which is a cost effective, quick service delivery model. He has served 85.75 Lakhs persons with disabilities for 46 years. He left no stone unturned to reach the unreached to care for the uncared sections of the society, by conducting screening programmes in schools, slums, rural, urban areas, Colleges, Pvt & Govt. Offices. He started mobile health clinics in rural areas and charitable clinic in Sweekaar. He also started three campuses in Kadapa, Guntur, Tandur. He employed 105 DIVYANGJANS in Sweekaar, 640 DIVYANGJANS in the community for which he received an Award by President of India in 1994. Dr. Hanumantha Rao has extended services to needy through home for senior citizens, drug de-addiction centre, artificial limb center, integrated rural rehabilitation center for adult mentally handicapped, state information center for Disabled, early intervention center for Children with Developmental Delays, Autism, Attention Deficit Hyperactive Disorder, Learning Disability, Institute for Mentally ill patients. Dr. Hanumantha Rao received Dr.B.C.Roy award in 1995. He also received National Awards from The Presidents of India 5 times, and numerous other National & International Awards. He is one of the three persons from Telangana to be awarded with India's fourth highest civilian award, the Padma Shri. He was selected for the award from the field of medicine. According to Dr Hanumantha Rao - 'It is his dream is to establish a university of rehabilitation sciences for the welfare of disabled people, which will be a one-of-its-kind institution in the world.'

Courtesy - Dr P Namratha Rao

Braille

Dr. Lata Bhat
Developmental and Behavioural Pediatrician, Delhi

India is home to one-third of the world's blind. But, the braille literacy rate in India is only 1% which is far lower than the regular literacy rate of 77.7%.

History of Braille

Louis Braille (1809-1852) was born in France. At the age of three, he wounded his right eye with a cobbler's tool while playing in his father's workshop. No medical knowledge could save his eyesight at that time..

Louis's left eye became inflamed, apparently due to subsequent sympathetic ophthalmia, and he eventually lost the sight in that eye. At the age of five, Louis Braille was completely blind. He is considered to be the inventor of a writing system by touch that bears his name, the Braille system. This revolutionary system has allowed blind people to access written culture, and it can therefore be considered a major advance in the quality of life for the blind. The immediate precursor of the invention of the Braille system was the alphabet created by Charles Barbier de la Serre (1767-1841) who created a language by touch designed for military and secret use. Louis Braille modified this alphabet into the Braille alphabet, which is practically the same one that is currently used. It required time to be recognized and to be implemented as a reading and writing method for blind people throughout the world. In 1950, UNESCO effectively universalized the Braille alphabet, and in 2005 it recognized Braille system as a "vital language of communication, as legitimate as all other languages in the world."

Indian Scenario

In 1943 in India, a government-appointed committee prepared a common Braille Code and circulated the same among various provincial Governments and institutions for the blind. When India gained independence in 1947, 11 Braille codes for different regional languages were in use in various parts of the country.

The recommendations of this conference led to the development of "Bharati Braille'' for the official Indian languages - Hindi, Tamil, Marathi, Gujarati, Bengali, Kannada, Punjabi, Assamese, Malayalam, Nepali, Odia, Telugu, & Urdu - and its recommendation for nationwide use. The National Institute for the Empowerment of Persons with Visual Disabilities (NIEPVD), then known as the National Institute for the Visually Handicapped, was also deeply involved in the standardization of Bharati Braille. Their Braille Development Unit contributed notation systems for Maths, Music, and Science, as well as Braille contractions, abbreviations, and shorthand

systems for most of the official languages of the country.

Bharati Braille is increasingly the basis for expanding education to more visually impaired learners. The National Education Policy, 2020, makes recommendations in section 6 of the document for "Equitable and Inclusive Education: Learning for All", focussed on "foundational literacy and numeracy, access, enrolment and attendance" along with "suitable technological interventions to ensure access can be particularly effective for certain children with disabilities." Alongside directions to make education accessible to children with disabilities through the right resources, it explicitly calls for "adequate and language-appropriate teaching-learning materials," including textbooks in accessible formats such as Braille. The NIEPVD also continues to conduct research towards the propagation and popularization of Bharati Braille, including ways to incorporate the script into higher education.

Taking Bharati Braille Forward

The advantages of Bharati Braille are clear - and with its rich history, the script is steadily becoming widespread. Perhaps the greatest challenge that remains, then, is ensuring that the people who would most benefit from knowing this accessible and useful script can learn and use it. As the NEP makes clear, alongside the English Braille script, Bharati Braille too can find its place in the education of visually impaired children.

Ref :

1. "Who was Louis Braille". Royal Blind. Archived from the original on 8 April 2019. Retrieved 3 January 2018.
2 "Braille Chapter VI " (PDF) Archived from the original (PDF) on 2013-11-03. Retrieved 2012-08-30
3. Braille in India: How Languages Found Expression in Bharati Braille;Braille;oct06,202

Seizures and Epilepsy : An Overview

Dr Rekha Mittal
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INTRODUCTION

Seizures are one of the commonest pediatric neurological problems. They require a correct diagnosis and classification as far as possible, for appropriate treatment and counseling.

TERMINOLOGY

Seizures

A seizure is the clinical manifestation (ie, signs and symptoms) of an abnormal excessive paroxysmal synchronous neuronal activity in the brain, which can have myriad manifestations.

Table 1 Clinical manifestations during seizures

- Abnormal motor activity, which may be a tonic contraction or single or repetitive jerks
- Impairment or loss of consciousness or awareness
- Abnormal behavior
- Abnormal sensory phenomena eg abnormal sensations, visual phenomena, smell, taste
- Abnormal feeling or emotions
- Autonomic symptoms

Having a seizure does not always mean that the child has epilepsy.

Seizures can be :

Unprovoked :when there is no immediate precipitating cause

Acute symptomatic seizures : which occur during an acute illness eg meningitis, head injury

Epilepsy

Epilepsy is defined neurophysiologically as a disease of the brain characterized by an enduring predisposition to generate epileptic seizures, and by the neurobiologic, cognitive, psychological, and social consequences of this condition. The definition of epilepsy requires the occurrence of at least one epileptic seizure.

Practically, epilepsy is a disease of the brain defined by any of the following conditions:

1. At least two unprovoked (or reflex) seizures occurring greater than 24 hours apart.
2. One unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years.
3. Diagnosis of an epilepsy syndrome

(From the International League Against Epilepsy – [ILAE]definition)

Epilepsy Syndrome

This is a syndrome where epilepsy is a prominent feature, and is defined by a cluster of features occurring together (Table 2). It may have

associated etiologic, prognostic, and treatment implications. There are many well-recognized syndromes, such as childhood absence epilepsy, West syndrome, and Dravet syndrome, etc.

Table 2. Information required for identifying an epileptic syndrome
Seizure type(s) (seizure semiology plus EEG pattern)
Age of onset and remission
Developmental status and co - morbidities
Etiology
Anatomy and imaging features
Precipitating factors
Prognosis (occasionally)

CLASSIFICATION OF SEIZURES, EPILEPSIES AND EPILEPSY SYNDROMES

It is very important to classify seizures and epilepsy type, and identify the epilepsy syndrome wherever possible, as this is important for starting correct treatment and prognos¬tication, and may also help to identify etiology and genetics.

The classification of seizures and epilepsies has been revised in 2017, and can be seen in detail from the the ILAE website. (https://www.ilae.org/guidelines/definition-and-classification/operational-classification-2017)

Steps in Classification

(a) Classify seizure type

(b) Classsify epilepsy type

(c) Identify epilepsy syndrome

At every step, one should look for

(a) look for etiology and classify into one of the etiology groups

(b) identify co – morbidities.

Attempts to classify the seizure and epilepsy types must be made after epilepsy imitators have been ruled out.

In some settings, classification according to seizure type may be maximum level of diagnosis possible. as there there may not be enough information to be able to make a higher-level diagnosis

eg. when a patient has only had a single event or description is not clear.

EPIDEMIOLOGY

In India prevalence rates for epilepsy are 5.59 per 1000 population. Males and females are equally affected and these rates are the same in different geographical areas.

ETIOLOGY

Etiology is multifactorial, and almost any insult to the brain can result in seizures. Epilepsy can result from sequelae of prolonged seizures, as well as malformation of the CNS, genetic and metabolic causes .

INVESTIGATIONS

Investigation of seizure:

The plan of investigations depends on suspected cause of seizures to rule out provoked or symptomatic seizures.

Investigation of epilepsy

EEG

It is important to remember that EEG can be normal in cases of epilepsy while abnormal EEG does not necessarily mean an epileptic disorder. 15% of cases of epilepsy have a normal EEG while 10% of the normal population has an abnormal EEG. Thus the EEG must be interpreted in the clinical context.

Ictal recordings are preferable over interictal ones, but most EEGs are interictal. Special provocation procedures like sleep deprivation, hyperventilation and photic stimulation can be used to increase the yield of EEG.

Video EEG is an EEG recording where the EEG and video recording is done at the same time. It may help to differentiate non epileptic events from seizures, and also help in identification of the type of seizure .

Neuroimaging

Neuroimaging gives important information about the etiology in cases of symptomatic epilepsies.

MRI is preferred since small lesions like cortical dysplasias cannot be picked up on CT scan. Generally neuroimaging should be done in all cases except where clinical features and EEG are suggestive of an idiopathic epilepsy.

PET and SPECT, done as pre epilepsy surgery workup in refractory epilepsy, are functional scans that may be done to study the metabolic activity or perfusion respectively and help in identifying epileptic foci.

Other investigations

Other investigations depend on suspected etiology in case of symptomatic epilepsies. They include metabolic and genetic tests.

NATURAL HISTORY

Epilepsy may undergo remission without treatment in 30 % cases, as estimated by studies of epilepsy in poor countries where no treatment has been given for epilepsy because of financial constraints.

Of those who are treated, 60 - 70 % undergo remission, while the remaining have drug resistant epilepsy.

DIFFERENTIAL DIAGNOSIS OF SEIZURES AND EPILEPSIES: THE EPILEPSY IMITATORS

Epilepsy imitators are recurrent paroxysmal events which resemble seizures but are not the result of abnormal electrical discharges from the neurons. They are also known as nonepileptic attack disorder, NEEs, epilepsy mimickers and pseudoseizures.

The types of epilepsy imitators vary with age (Table 2). The detection of epilepsy imitators requires knowledge of the seizure types as well as types of epilepsy imitators at different ages.

Table 2: Common EIs at different ages

Neonates – 2 years	Early childhood	Late childhood and adolescence
Abnormal movements	Abnormal movements	Abnormal movements
during sleep	*during sleep*	Psychogenic "seizures"
benign neonatal sleep myoclonus	Sleep Myoclonus	
sleep myoclonus		Loss of consciousness/ awarenss / tone
	when awake	Psychogenic "seizures"
when awake	Chorea	
Self gratification behaviour	Tics	Syncope
Jitteriness	Paroxysmal choreoathetosis	Narcolepsy /Cataplexy
Stereotypies		
Myoclonic movements – benign myoclonus of early infancy	Abnormal behavior	Others
	during sleep	Fears and phobia
Paroxysmal tonic upgaze	Sleepwalking	
Spasmus nutans	Night terrors	
Opsoclonus myoclonus	Nightmares	
	Confusional arousals	
Abnormal breathing phenomena	when awake	
Recurrent apneic attacks	Panic/rage attacks	
Breathholding spells	Delirium	
	Loss of consciousness/awarenss	
	Daydreaming	
	Others	
	Benign paroxysmal vertigo	
	Migraine	

Also disorders that mimic seizures are more likely to occur in children who have epilepsy, associated with abnormal EEG or to be relieved by antiepileptic drugs (ASMs) making their diagnosis more difficult.

MANAGEMENT OF EPILEPSY

DRUG THERAPY

Decision making: should antiseizure medication (ASM) be started.

ASM must be started to prevent seizure recurrence., once iit is confirmed that seizures are recurrent.. The decision should be taken after counseling the parents, especially after a first seizure.

Generalized tonic clonic seizures: Recurrence may occur in only around 40 % cases, hence a first episode of generalized tonic clonic seizures does not require treatment with long term anti epileptic drugs.

Focal, absence, atonic and myoclonic seizures have a high rate of recurrence. Most of the time, the patient will have had multiple seizures when they report. Hence one may consider starting ASM after first seizure also, especially if a syndrome has been identified in which recurrent seizures are likely.

Choice Of ASMs (Table 3)

The decision regarding specific drug depends upon:

- the type of seizures and epileptic syndrome
- side effects
- cost
- life style of the patient.

Monotherapy should be the rule. Polytherapy should be avoided because of drug interactions, and subsequent alteration of drug efficacy.

Starting ASM

ASM should be started in a small dose and build up gradually to an optimal dose. It is best to calculate A target dose should be calculated, and 1/3rd of that should be started, and increased by 1/3rd every week till target dose is reached, in case of drugs with short half-lives like carbamazepine and valproate. Long half-life drugs like Phenytoin and Phenobarbitone may be started with the full optimum dose at starting. If seizures continue, the dose should be increased gradually till maximum tolerated dose is reached or seizure is controlled.

Treating a relapse

Restart the same drug in same dose as was effective in controlling seizures earlier .

Changing ASM

Start the second drug in a small dose, and build it up to a dose effective in controlling seizures.

Taper off the second drug as above.

Principles of combination therapy

- Use drugs with different mechanisms of action
- Drugs should have large therapeutic index
- Few side effects
- Keep in mind drug interactions : combination may cause increased toxicity or decreased efficacy

Drug level monitoring

Drug levels monitoring is not usually required, except in certain specific situations like refractory seizures, suspected toxicity or polytherapy. Drug dosage should be decided by clinical control of seizure or appearance of side effects.

Drugs whose levels are useful include phenytoin, carbamazepine, phenobarbitone and valproate.

Table 3 : Drugs used in treating epilepsy					
Conventional AEDs					
	Indications	Preparation	Dose	Side Effects/ toxicity	Remarks
Phenytoin	Focal seizures GTCS	Suspension 30 mg/5ml 125mg/5ml Tablets 100mg	5 - 8mg/kg/day In 2 divided doses	Gum hypertrophy Rash Steven Johnson syndrome Toxicity Ataxia, nystagmus, blurring of vision	Younger children require higher doses Since it has a long half life, the drug may be started with the target dose Make sure about which preparation the patient is using, because of wide variation in the concentration in different preparations Avoid phenytoin in children if cost is not a factor
Phenobarbitone	Neonatal seizures Status Epilepticus Tonic – clonic Focal seizures Clonic Febrile	Tablets 30 mg Syrup 30 /5ml	3- 5 mg/kg/day Single dose or 2 divided doses	Sedation, hyperkinetic behavior, Dependence	Younger children require higher doses Since it has a long half life, the drug may be started with the target dose
Valproate	Broad spectrum, effective against any seizure type Idiopathic generalized epilepsies – Childhood absence epilepsy, juvenile myoclonic epilepsy, infantile spasms Lennox Gastaut syndrome.	Tablets 200, 400 mg Syrup 200 mg/5ml	20 – 40 mg/kg/day Doses up to 80 mg/kg/day may be used provided there are no side effects 3 divided doses Sustained release preparation – 2 divided doses	Hepatotoxicity Drowsiness Lethargy, weight gain, Hyperammonemia Teratogenicity	Precaution in children < 1 year

Carbamazepine	Focal seizures Generalise tonic clonic seizures	Suspension – 100mg/5ml Tab 200. 400, 600 mg Sustained release tablets are also available 200mg, 500mg	10 – 40 mg/kg/day 3 divided doses	Rash Bone marrow depression Steven Johnson syndrome	Start with low dose NOT to be used in absence and myoclonic, atonic and atypical absence seizures The suspension is thick and settles at the bottom, It needs to be shaken thoroughly
Nitrazepam	Myoclonic seizures	Tab 5mg, 10 mg	0.5mg/kg/day 2 divided doses	Drowsiness Hypotonia Ataxia	
Clonazepam	Myoclonic seizures, atonic, tonic , atypical absence	Tabs 0.5mg, 2 mg	0.03 – 0.1mg/kg/day 2 – 3 divided doses	Drowsiness Hypotonia Ataxia	
Clobazam	Add on drug for any seizure type Intermittent use in Febrile seizures, or seizures due to known precipitating causes	Tabs 5mg, 10 mg,20mg	0.5mg/kg/day 1- 2 divided doses	Drowsiness Hypotonia Ataxia < than other benzodiazepines	
Newer AEDs					
Oxcarbazepine	Same as carbamazepine	Tab 150mg, 300mg, 600mg Suspension	8 – 10 mg/kg /day in 2 divided doses Target maintenance – 30 mg /kg/day Maximum 50 mg/kg/day	Fewer side effects like allergies and bone marrow suppression	Drug level monitoring is not required

Vigabatrin	Monotherapy : Infantile Spasms especially those due to Tuberous sclerosis Add on : Refractory focal seizures	Tab 500mg	Start with 40 mg/kg/day Target maintenance dose 80 – 100 mg/kg/day Max 120 – 150 mg/kg/day	Visual field defects Blindness	Not easily available/ manufactured in India. Perimetry /Fundoscopy regularly to check for visual complications
Lamotrigine	Broad spectrum, add on drug. Multiple seizure types Monotherapy – refractory focal seizures in children > 12 years Add on Focal/generalized epilepsy West syndrome, Broad spectrum add on drug for epilepsy with multiple types of seizures eg Lennox Gastaut syndrome	Tab 25mg, 50 mg, 100mg	With valproate: start with 0.15mg/kg/day Increase by 0.3mg/kg/day every 2 weeks till maintenance dose of 1-5mg/kg/day Monotherapy: 0.3 mg/kg/day Increase by0.6mg/kg/day every 2 weeks till maintenance dose of 4. 5 – 7.5mg/kg/day With enzyme inducing drug start with 0.6mg/kg/day increase by 1.2 mg/kg/day every 2 weeks till dose of 5 – 15mg.kg/day. All doses divided into BID doses.	Rash, headache drowsiness	Use with care with valproate Level is affected by other AEDs May aggravate myoclonic seizures sometimes
Topiramate	Monotherapy : Focal or generalized Epilepsy Add on Focal/generalized epilepsy West syndrome, Broad spectrum add on drug for epilepsy with multiple types of seizures eg Lennox Gastaut syndrome	Tab 25mg, 50 mg, 100mg, 200mg	Start with 0.5mg/kg/day Increase to 5mg/kg/day Max dose : 8 mg/kg/day	Drowsiness, ataxia, metabolic acidosis Hyperammonemia especially with valproate	Good drug with few drug interactions

Levetiracetam	Add on for Myoclonic seizures Focal seizures or generalized seizures	Tab 250mg, 500mg, 750mg	Start with 10 mg/kg /day 20 mg/kg/day increase weekly Increase to 60 mg/kg/day In 2 divided doses	Headache anorexia drowsiness Behavior problems	Safe drug for children No drug interactions with other AEDs
Gabapentin	Add on for refractory focal epilepsy without generalization Neuralgias	Tab 100mg, 300 mg, 400 mg, 600 mg	Start with 10 – 15mg/kg/day Target dose <5years 40 mg/kg/day >5years 30/mg/kg/day 3 divided doses	Headache anorexia drowsiness Behavior problems	Worsens myclonus and absences.
Rufinamide	Add on for Lennox Gastaut Syndrome and refractory focal seizures in children > 4 years	Tab 200mg and 400mg Suspension – 40 mg/ml	Start with 5 – 10 mg/kg/day in 2 divided doses with meals, increase weekly by 5 – 10mg/kg/day to max dose of 45mg/kg/day	Drowsiness, headache,vomiting Behaviour changes	Precaution – in severe hepatic dysfunction, drugs affecting QT interval

Follow up:

Parents should be instructed to maintain a seizure diary containing details of seizure type, duration and frequency.

Initial follow-up should be

- after four weeks
- if breakthrough seizures occur
- if side effects occur

Subsequent follow up (if seizures are controlled) : three monthly.

Indications for hospitalization

- Status Epilepticus
- To observe the seizure type
- Distinguish between seizure and epilepsy imitators
- Serious Adverse reactions
- To Check compliance

Duration of treatment is usually 18 mths - 24 mths seizure free period. Increasing duration antiepileptic drug therapy beyond 2 yrs does not decrease the risk of relapse. However, a decision may be taken to continue therapy beyond 2 years if the child had difficult to control seizures to begin with, or has structural epilepsy with developmental disorders, or certain epilepsy syndromes eg Lennox Gastaut syndrome, Juvenile myoclonic epilepsy.

Certain other epilepsies may warrant earlier stopping eg. benign centrotemporal epilepsy, acute symptomatic epilepsy due to inflammatory granulomas

Stopping ASM

Before discontinuing ASM, the parents must be counseled about the risk of relapse.

- The drug must never stopped abruptly, it must be tapered gradually over 4-12 weeks
- If patient is on multiple drugs, taper 1drug first.
- Wait for 1 month
- Taper the next drug

Refer to Pediatric Neurologist

- Children < 2 years
- Uncontrolled Seizures
- Suspected Syndromes

FURTHER READING :

1. Rubinstein S, Lev A. Seizures in Childhood: Aetiology, Diagnosis, Treatment, and What the Future May Hold. EMJ Neurolog 2019; 7 : 62 – 70. https://doi.org/10.33590/emjneurol/10313721.
2. Mittal R : Seizures, Epilepsy and Non Epileptic Events . Ed Parthasarthy A, Menon PSN, Nair MKC. IAP Textbook of Pediatrics 7th edition Publisher- Jaypee Brothers Medical Publishers (P) Ltd, Delhi. 2019. Pages 451 - 473
3. Minardi C, Minacapelli R, Valastro P, Vasile F, Pitino S, Pavone P, Astuto M, Murabito P. Epilepsy in Children: From Diagnosis to Treatment with Focus on Emergency. J Clin Med. 2019 Jan 2;8(1):39. doi: 10.3390/jcm8010039. PMID: 30609770; PMCID: PMC6352402.
4. https://www.ilae.org/guidelines/definition-and-classification

Journal Scan

Exome sequencing for patients with developmental and epileptic encephalopathies in clinical practice Ingrid E. Scheffer, Caitlin A. Bennett, Deepak Gill, Michelle G. de Silva, Kirsten Boggs, Justine Marum, Naomi Baker, Elizabeth E. Palmer, Katherine B. Howell.

Dev Med Child Neurol. 2023;65:50–57.

Abstract

Aim: To assess the clinical utility of exome sequencing for patients with developmental and epileptic encephalopathies (DEEs).

Method: Over 2 years, patients with DEEs were recruited for singleton exome sequencing. Parental segregation was performed where indicated.

Results: Of the 103 patients recruited (54 males, 49 females; aged 2 weeks–17years), the genetic aetiology was identified in 36 out of 103 (35%) with management implications in 13 out of 36. Exome sequencing revealed pathogenic or likely pathogenic variants in 30 out of 103 (29%) patients, variants of unknown significance in 39 out of 103 (38%), and 34 out of 103 (33%) were negative on exome analysis. After the description of new genetic diseases, a molecular diagnosis was subsequently made for six patients or through newly available high-density chromosomal microarray testing.

Interpretation: We demonstrate the utility of exome sequencing in routine clinical care of children with DEEs. We highlight that molecular diagnosis often leads to changes in management and informs accurate prognostic and reproductive counselling.Our findings reinforce the need for ongoing analysis of genomic data to identify the aetiology in patients in whom the cause is unknown. The implementation of genomic testing in the care of children with DEEs should become routine in clinical practice.

Journal Scan

The prognostic value of neonatal conventional-EEG monitoring in hypoxic-ischemic encephalopathy during therapeutic hypothermia. Emilie Bourel-Ponchel, Laurent Querne, Florence Flamein, Ghida Ghostine-Ramadan, Fabrice Wallois, Marie Dominique Lamblin.

Dev Med Child Neurol. 2023;65:58–66.

Abstract

Aim: To determine the prognostic value of conventional electroencephalography (EEG) monitoring in neonatal hypoxic–ischemic encephalopathy (HIE).

Method: In this multicentre retrospective study, 95 full-term neonates (mean of 39.3wks gestational age [SD 1.4], 36 [38%] females, 59 [62%] males) with HIE (2013–2016) undergoing therapeutic hypothermia were divided between favourable or adverse outcomes. Background EEG activity (French classification scale: 0–1–2-3-4-5) and epileptic seizure burden (epileptic seizure scale: 0–1-2) were graded for seven 6-hourperiods. Conventional EEG monitoring was investigated by principal component analysis (PCA), with clustering methods to extract prognostic biomarkers of development at 2 years and infant death.

Results: Eighty-one per cent of infants with an adverse outcome had a French classification scale equal to or greater than 3 after H48 (100% at H6–12). The H6–12 epileptic seizure scale was equal to or greater than 1 for 39%, increased to 52% at H30–36 and then remained equal to or greater than 1 for 39% after H48. Forty-five per cent of infants with a favourable outcome had a H6–12 French classification scale equal to or greater than 3, which dropped to 5% after H48; 13% had a H6–12 epileptic seizure scale equal to or greater than 1 but no seizures after H48. Clustering methods based on PCA showed the high efficiency (96%) of conventional EEG monitoring for outcome prediction and allowed the definition of three prognostic EEG biomarkers: H6–78 French classification scale mean, H6–78 French classification scale slope, and H30–78 epileptic seizure scale mean.

Interpretation: Early lability and recovery of physiological features is prognostic of a favourable outcome. Seizure onset from the second day should also be considered to accurately predict neurodevelopment in HIE and support the importance of conventional EEG monitoring in HIE in infants cooled with therapeutic hypothermia.

Month in pics

Sports Day Celebration at CCDD Sangamitra Intervention Centre

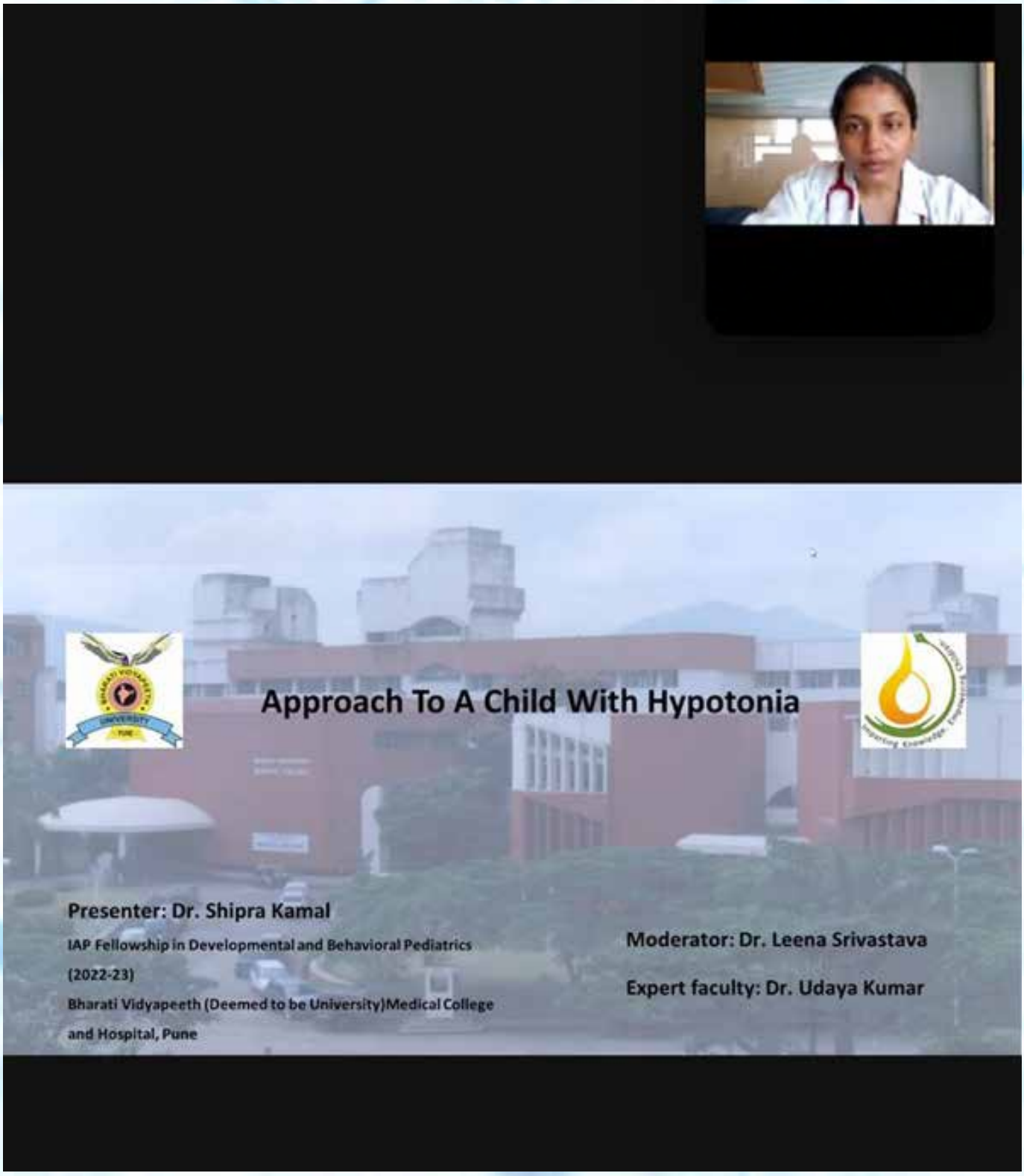
Month in pics

Dr Nandini Mundkur honoured by IAP Bangalore Ped Society on 23 Jan 2023 for her work in the field of child neuro development

Month in pics

Dr.Lata Bhat and Dr Shambhavi Seth as faculty in Workshop on Developmental screening in office practice during PCNI 2022 on 29 October 2022

Month in pics



Approach to a case of Hypotonia
Presented by Dr Shipra Kamal from Bharati Vidyapeeth College, Pune

Month in pics

Month in pics

Opening of a new branch - With the blessings of all the best Pediatricians in Siliguri and family, we treated for last five years.... We are taking another challenges to serve with our best resources in Coochbehar in the way as I believe.. “Early Intervention For Better Tomorrow “ - Dr. Sujit Kundu

Month in pics