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Earnest request to all
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to become

CIAP Members
at the earliest,
if not already done.

Dr Lalit Mendiratta
President
IAP Delhi

Dr Manish Gupta
Secretary
IAP Delhi

Dr Pankaj Garg
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Treasurer, IAP Delhi

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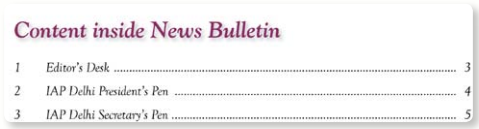

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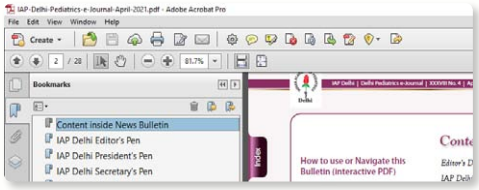

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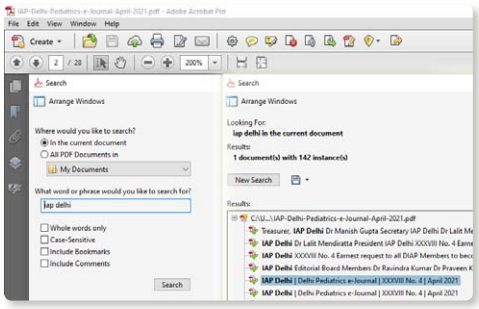

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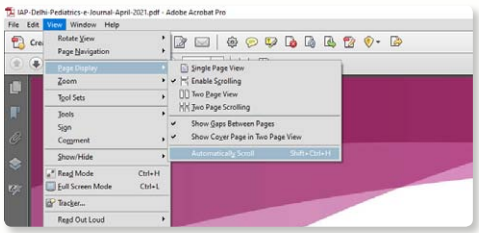

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IAP Delhi Editor's Pen

Dr Pankaj Garg

Treasurer cum Secretary Elect.
IAP Delhi

Dear Delhi IAP Members,

It is heartening to notice that the impact of second wave of COVID-19 seems to be getting lesser and lesser and life will come to normal in due course of time. All the pediatricians should have a **high index of suspicion for Multisystem Inflammatory Syndrome related to COVID-19 (MIS-C) as many children who suffered any severity of COVID infection may be affected.** Delhi Pediatrics April issue had very relevant article related to MIS-C and was very much appreciated by the members.

This month also we were **restricted to homes and no physical meetings** could be done but the online activities have started getting momentum again and Delhi IAP is also doing its bit by regular publication of its e Journal. I present before you the May issue of the e Journal of Delhi Pediatrics.

The original **articles include an Update on Epilepsy and rabies prevention and management. In the drug review, paracetamol is being discussed and use of MDI inhalers** are very nicely explained in very simple language. In our column **"Tip of the month", the screening of normal babies for developmental mile stones is discussed**. Tetralogy of Fallot is highlighted in "**Peeping into heart".** We have kept the articles short and in crisp format for easy reading. We have also continued with journal clippings in this issue.

Keeping the tradition, we have shared one photo and X-Ray quiz in this issue. I request you to send the answers on the email of the Delhi secretariat and we will be publishing names of all sending the correct answers of the quiz in the next issue. We hope the readers find these features of interest.

We have also included the activities done in the month of May along with the calendar of future planned events.

We have included a cultural page dedicated to the **creative writing by the members in form of poems or short stories**. I hereby request all of you to send your articles for publication as well.

Happy Reading,

Long Live IAP.

Jai Hind.

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IAP Delhi President's Pen

Dr Lalit Mendiratta
President
IAP Delhi

Hello Friends,

A t last, there is a sign of little relief that pandemic curve has come down but we all have to take all precautions and advice everyone in the community for COVID-19 Appropriate Behaviour. **I am very proud of my branches and all dear members who have done magnificent job** in the last 2 months of second wave of the pandemic in **helping each other, their families and of course the community** in whatever way they could even in all the odd circumstances faced by them. I salute all our corona warriors and my deep and heartfelt condolences to families who have lost lives. Despite all odds, we all are committed to fight against COVID-19 pandemic & will not give up. I once again thank all dear IAP members who have been providing Tele-consultations & advice on mental health issues to all children of the child care institutions all over Delhi.

In anticipation of third wave (if any), IAP Delhi has given few recommendations to State and Central Government regarding enhancement of Health Care infrastructure and provision of essential drugs and equipment's.

I will request all members to continue routine immunisation services as we have been doing throughout the pandemic irrespective of the lock down and also encourage all adults above 18 years of age for COVID-19 Vaccination. Vaccination is the most effective tool we have at the moment for prevention.

After the unavoidable break due to pandemic, we are kicking off with our academics with Neuropedia, major scientific event coming up in June 24th-25th 2021. In addition, ***we have planned few spiritual activities and cultural event like Antakshari on 20th June and International Yoga Day Celebration on 21st June*** for all our members. These activities have a sound and positive impact on our mind and soul.

My sincerest thanks to all my Team members **Dr Manish Gupta, Dr Anil Vaishnavi, Dr Deepak Gautam and not to forget Dr Pankaj Garg** who has been working hard for our e-Journal activity every month.

Thanks to all our CIAP executives for support.

God bless good health to all our members and their families.

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IAP Delhi Secretary's Pen

Dr Manish Gupta
Secretary
IAP Delhi

Dear Friends and IAP Delhi Fellows,

I wish you all good health and mental peace in current times.

We all know Delhi suffered from immense health problems due to covid cases. We thank all **IAP Delhi members for performing all their clinical work with dedication and helping out each other for their needs**.

We offer **Condolences to Families of Dr Sudarshan Kumari and Dr Sanjeev Kumar for their irreparable loss**. The Executive Board members of IAP Delhi have decided to help the family of Dr Sanjeev Kumar in this time of need as per their capacity.

We request all Members of IAP Delhi to take full precautions, promote social distancing and promote Covid vaccinations among their patients and friends of more than 18 years of age.

Many planned activities including monthly clinical meet could not be done due to most of the members and even office bearers had to encounter Covid in family.

Hoping a better and healthy June for all of us

Thanks and Regards

Yours Sincerely,

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Section I: Academic

Epilepsy Update

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Epilepsy is a common treatable neurological condition in children. It affects 1-2% of population and 4% of children. Roughly 60% of later epilepsy have roots in preventable childhood events (e.g., perinatal insults, hypoglycemia, neuro-infections & trauma). Two-third epilepsy patients become seizure free with appropriate mono-therapy. In spite of effective interventions, there is 80% treatment gap in developing countries (poverty, lack of trained person, myths & social stigma).

Paediatricians have an important role both in treatment and prevention of epilepsy by minimising neurological insults. Evidence based clinical practice guidelines can improve rational therapy & counselling.

Definitions

- **Seizure**: It is a transient abnormal neuronal activity in brain resulting in clinical alteration of neurological function (motor, sensory, autonomic or psychological).

  Seizures are of two types:

  a. Provoked or Acute symptomatic seizure-Seizures occurring in close temporal relation with an acute insult to central nervous system (fever, trauma, stroke, hypoxia, metabolic disturbances) mostly occur within a week of acute brain insult.

  b. Unprovoked or Epilepsy-Traditionally defined as two or more than two unprovoked seizures occurring more than 24 hrs apart. However recent ILAE (International League Against Epilepsy) guidelines state that epilepsy can be diagnosed even after one single unprovoked seizure, if risk of further seizures is high (> 60%) or seizure is part of a recognizable epilepsy syndrome (e.g. juvenile myoclonic epilepsy in appropriate setting)

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- **Epilepsy Syndrome**: Epileptic conditions with cluster of features such as age dependent onset / remission, type of seizures, EEG pattern, brain imaging abnormalities & genetic analyses. Syndrome identification helps to determine management and outcome.

  What is new in Classification of seizures and epilepsy: A correct classification of seizures and epilepsy is the cornerstone in rational evaluation, drug choice and patient counselling. In new ILAE (2017) guidelines epilepsy has a multilevel classification.

  1. **First level has three sequential steps**: Identify (a) type of seizure (b) followed by epilepsy type and then (c) try to establish epilepsy syndrome wherever possible. (Figure 1)

     a **Type of Seizures**: Based on initial manifestations seizure are divided into focal onset, generalized onset, and unknown onset. Seizure is classified as generalized only if it is bilateral from onset. Focal onset seizures are further subdivided into seizures with aware or impaired awareness. Both focal & generalized seizure are further subdivided into motor/non-motor onset seizures (Fig 2) . After about 40 years terms like "simple and complex partial seizures" "grand mal", "petit mal" have been discarded. Instead of secondary generalization, focal to bilateral tonic clonic term is used. Some new terms added in ILAE classification (2017) are mentioned (Table 1).

     b **Epilepsy Type**: It is divided into four groups: focal epilepsy, generalized epilepsy, combined generalized and focal epilepsy (new group added) & unknown. (Fig 1)

     c **Epilepsy Syndrome Identification**: This is most important development in current epileptology for treatment & prognosis. Most of epilepsy syndromes are well defined & easy to diagnose. Educational ILAE website (www.epilepsydiagnosis.org) and website of Journal Epileptic Disorders (www.epilepticdisorders.com) provide descriptions, EEGs & video examples of many seizure types and epilepsy syndromes

     Common epilepsy syndromes in generalized epilepsy include: childhood absence epilepsy, juvenile absence epilepsy, juvenile myoclonic epilepsy, and generalized tonic-clonic seizures alone.

     Focal Epilepsy Syndromes in Childhood: They have a self-limited course and instead of earlier terminology of benign they are now referred as self

limited & pharmaco-responsive (easily controlled with drugs). Common examples are childhood epilepsy with centro-temporal spikes (CECTS) earlier called Rolandic epilepsy or benign childhood epilepsy; self-limited epilepsies of childhood with occipital spikes.

2. **Identifying etiology**: New ILAE (2017) classification stresses to determine etiology right from the initial presentation. Depending on the resources available besides neuro- imaging, gene mutations and autoimmune panel, if available, should be utilized if indicated. Etiologically epilepsy has been sub-divided into six major etiological groups (Structural, Genetic, Metabolic, Infectious, Immune, Unknown) . In new classification a patient's epilepsy may be classified into more than one etiological group (e.g. tuberous sclerosis included in both structural & genetic etiology).

   Earlier concepts to classify etiology as idiopathic, symptomatic & cryptogenic have been discarded.

3. **Co-morbidities**: Reported in 40-50% of children with epilepsy and may be more disabling than epilepsy. Thus new ILAE (2017) classification stresses on diagnosis of co-morbidities for holistic management of epilepsy.

   Note: It is important to use new terminology so that everyone is speaking and understanding the same language, which is fundamental to the optimal management of epilepsy. The full document of classification can be freely downloaded at ILAE website (https://www.ilae.org/guidelines/definitionand-classification) for further reading.

Pre-requisites before starting Treatment

Before labelling seizures epileptic try to answer the following questions:

1. Is it true Epileptic seizure or Non-Epileptic event?
2. What is the seizure type?
3. Will the seizure recur?
4. What is type of epilepsy?
5. Is it part of an Epileptic syndrome?
6. What is the etiological diagnosis?
7. What are associated co-morbidities?
8. Which are investigations required?
9. What is best treatment?

1 Is it true epileptic seizure or Non-Epileptic event (NEE)?

Several paroxysmal non-epileptic events can be mistaken for seizure. Upto 20-30% of intractable epilepsy are in fact NEE. Correct diagnosis helps to avoid unwanted investigations & treatment. A detail history of sequence of event what child was doing prior to event , precipitating factors, observation, asking child to enact or making a home video will suffice. In ambiguous situation wait for recurrence. Video EEG is the gold standard .

Most of these events are age related & some important differentials include:
New born: Startle, Jitteriness, Benign neonatal sleep myoclonus
Infants: Breath holding spells, Sandifer syndrome Shuddering, self-gratification
Beyond infancy: Syncope, Psychogenic-nonepileptic seizures, Migraine variant, Night terrors, Ticks, Stereotypes

2 Is this a true seizure?

Diagnosis of epilepsy is almost always based on clinical history. Take history from child, onlooker, parents and teachers. Parents can be asked to recreate seizure or make home video of event. In case of doubt physicians can imitate & demonstrate physically or show video-taped examples of different epileptic or non-epileptic events to parents.

1. Enquire about age at onset; any precipitating factor (Fever, diarrhea, trauma, stress, missing dose, seizure provoking drugs) events just before & at the end of seizure, seizure in awake/sleep.
2. **Seizures**: Frequency, semiology, generalized /focal, single/multiple, aura, sequence , staring, loss of sensorium, injury, post-ictal deficit, recall of event, automatism, incontinence, frothing.
3. **Generalized tonic clonic seizures** are easy to diagnose, while epileptic spasm, myoclonic jerks and focal jerks may be missed by parents. Epileptic spasms are commonly mistaken as infantile colic.
4. **Development**: Normal/ delayed /regression
5. **Birth history**: Enquire for intrauterine infections, hypoxic encephalopathy, hypoglycemia and neonatal seizures.
6. Family history of epilepsy, febrile seizures, other neurological disorders

7. Physical & Neurological Examination: Detailed clinical ,neurological and development examination is essential to rule out disorders associated with high risk of epilepsy (e.g cerebral palsy , congenital malformations of brain , tumors, stroke and inborn error of metabolism).
8. Other salient points: Look for head circumference (micro/macrocephaly) and facial dysmorphism. A good skin examination for hypo/hyper-pigmented lesions and facial nevus must be done in all as there is a high risk of epilepsy in neurocutaneous syndrome (like tuberous sclerosis, neuro-fibromatosis, Sturge-Weber syndrome). Fundus examination to rule out out intraocular cysticercus and papilledema.

3 What is the Seizure type?

Type of seizure (Table 1) is single most important determinant for diagnosing epileptic syndrome, etiological diagnosis & choosing most appropriate anti-seizure drug (ASD)

Focal onset seizures are characterized by one or more of aura, motor, autonomic, altered awareness (dyscognitive) that may evolve to bilateral convulsive seizure

Localization & lateralization of seizure semiology is done on ictal & postictal signs (motor or sensory phenomena, hand dystonia, version, aphasia, automatism).

4 Will the seizure recur?

After first unprovoked seizure risk of recurrence is about 50% over next five years & after second seizure risk is 70-80 % within next one or two years. Risk factors for seizure recurrence are: abnormal EEG, focal seizures, prior febrile seizures, seizures in sleep, family history of seizures.

5 Is it part of an Epileptic syndrome?

Correct diagnosis helps in choosing right drug, duration of treatment & prognosis

6 Co-morbidities:

Learning problems, intellectual disability, autism spectrum disorders & psychiatric features (depression, psychosis) are common problems. Management is difficult & requires multi-disciplinary approach.

Investigations:

About 80% of community epilepsy can be managed without any investigations. They don't help in making diagnosis of epilepsy which is always clinical but help to confirm diagnosis & establish etiology

i. **Neuroimaging:** MRI brain is preferred over CT brain if affordable. MRI is more sensitive in detecting etiology (focal cortical dysplasia, perinatal insults sequalae, small granuloma, congenital malformations, neurocutaneous malformation, hippocampal sclerosis, vascular malformations) & besides being safe. CT is useful in diagnosis of calcification & in emergency situations to rule out intracranial hemorrhage & mass effect.

Indications for neuro-imaging

- Seizures in early infancy except simple febrile seizure.
- Focal seizures (except self limited focal epilepsies of childhood)
- Developmental delay
- Abnormal neurological signs & neuro-cutaneous markers
- Focal EEG abnormality
- Prolonged status epilepticus
- Intractable epilepsy
- In India neuro-cysticercosis is most common cause of seizures so a contrast neuro-imaging of brain must be done
- Neuro-imaging is NOT indicated in-
  i. Non- epileptic events
  ii. Simple febrile seizures
  iii. Recurrent seizures in known generalized epilepsies
  iv. Self limited & pharmaco-responsive focal epilepsy
  v. Childhood absence epilepsy

ii **Electroencephalography (EEG)**: Conventional EEG is most important part of initial work up. It can establish diagnosis of epilepsy if a seizure is recorded. But inter-ictal EEG can be problematic because of false positive and negative results. Upto 5 % normal children have abnormal EEG without clinical seizures and 40% children with chronic epilepsy have no abnormalities on EEG.

EEG also helps in confirming specific syndrome, differentiation of seizure from non-epileptic event; prediction of long-term outcome/ & seizure recurrence risk

Preferably EEG should be done 3-4 days after seizure to avoid post-ictal slowing interference from reporting. Ideally both awake and sleep record should be taken. Sleep deprivation and activation procedures (Photic stimulation and hyper-ventilation) should be part of EEG recording.

Video EEG: Indicated for differentiating true seizures from non-seizure paroxysmal disorders & part of pre-surgical evaluation

Genetic workup: More important in early onset epileptic encephalopathies & in children with positive family history of seizures. It not only helps in genetic counseling but also proper drug selection.

Metabolic & autoimmune workup: May be required depending upon history & examination

Management: All patients must have a comprehensive health plan. Goal of treatment is complete seizure control without significant adverse side effects & to maintain optimal quality of life. Important is to gain trust of family & involve them in decision making .

However treating physician must themselves be clear of goals of treatment in different type of epilepsies. Explain to parents & don't give unrealistic expectations to avoid doctor shopping.

When to start ASD:

- ASD not indicated after first unprovoked seizure in most children. Initiate after second seizure
- Indications for AED after 1st seizure:
  i. As per revised definition of epilepsy, high risk of recurrence may require ASD after first seizure (e.g. structural lesion, neurological deficit, epileptiform EEG)
  ii. Focal seizure (after excluding self-limited childhood focal epilepsies: centrotemporal or occipital spikes)
  iii. Myoclonic seizures & Absence seizures (Mostly patients already had multiple events)
  iv. 1st episode is status-epilepticus (as medical treatment may not be easily available)

Which medicine to start with:

- There is no ideal ASD. In most cases it has to be individualized. Choosing initial ASD is of paramount importance as more than 2/3rd newly diagnosed epilepsy children respond to appropriate AED & enter long-term remission. Lack of response to initial two appropriate ASDs predicts poor response.
- ASD are classified as:

  Older : Phenytoin,Carbamazepine Valporate,Phenobarbitone

  Newer ASD: Oxcarbazepine, Levitracetam, Topiramate, Lamotrigine, Clobazam, Zonisamide, Lacosamide

  Currently both older & new ASD are in use. There are no head-to-head comparison of newer ASD Vs old ASD but newer ASD have better tolerability due to fewer interactions & adverse effects. Older ASD are still used as 1st line for many specific seizure types & epileptic syndromes, while newer ASD are mainly used as add on drugs in intractable epilepsy.

  ASD choice depends upon efficacy for specific type of seizure (Table 3) & epileptic syndrome (Table 4); drugs side effect profile & pharmacokinetics; patient's age, gender & co-morbidities . Cost of treatment is important factor.

Principle of Therapy

- Initiate with appropriate. Monotherapy in appropriate dose controls seizures in 50-70 % cases
- Always start with low dose and titrate slowly to maximum pharmacological dose until either seizure remit or adverse effects emerge
- If seizures are un-controlled with 1st drug, choose alternate monotherapy & gradually withdraw 1st drug.
- Failure to respond to initial two appropriately selected ASDs predicts poor response. Need to consider other treatment opportunities for drug-resistant epilepsy, including epilepsy surgery, vagal nerve stimulation, and ketogenic diet.
- Before labeling drug failure, always check drug compliance, rule out NEE & other progressive neurological disorders

Duration of ASD

- Acute symptomatic seizures: Taper after 3-6 seizure free months
- Idiopathic generalized epilepsy generally given for minimum 2 yrs seizure free period.

- Symptomatic epilepsy require longer duration ASD
- Juvenile myoclonic epilepsy may require lifelong small dose of ASD

How to taper AED

- Always individualize. Mostly done after 2 years or more of seizure freedom and if the recurrence risk after AED withdrawal is acceptable. A slow weaning done over 3-6 months after consultation with parent. Risk factors for relapses are – Symptomatic epilepsies, structural brain lesions, abnormal neurological signs & EEG.

  Therapeutic drug monitoring: Not indicated in well controlled patients without adverse drug effects. May be indicated to assess drug compliance, toxicity and in intractable epilepsy

  Breakthrough seizure: Seizure occurring in a previously seizure free patient. Common seizure precipitant include – Missed dose/ inadequate dose, fever , anxiety , sleep deprivation, concomitant drug, menstruation.

  Intractable epilepsy: ASD therapy leads to seizure freedom in about 70% of all children with epilepsy. However, nearly one-third of patients may be refractory to anti-seizure drugs . After the failure of two ASDs, chances of seizure remission with subsequent ASD is less than 10%. Before labeling intractable epilepsy check drug compliance, rule out NEE. Other treatment options include ketogenic diet, vagal nerve stimulation & surgery.

  Future in epilepsy treatment: Precision medicine is a personalization of treatments that ideally should be targeted towards the precise molecular pathogenesis of disease. Since more than half of all epilepsies have genetic bases and single gene defects , it aims to provide targeted therapy for specific patho-physiology. At present available for a relatively small subset of epilepsy like Dravet syndrome, pyrodoxine-dependent epilepsy, and glucose transporter deficiency.

Parental Counselling: Most important.

i. Make parents and child part of team. Explain the nature of disease, recurrence risk, duration of treatment, need for drug compliance & follow up .

ii. Explain domiciliary management of seizure. Explain not to panic, recovery

position, use of rescue medicine if seizure lasts more than 3 minutes (Midazolam nasal spray (0.5 mg/puff) in dose of 0.2-0.4mg/kg/dose, maximum 10 mg.) Rough guide for every 5 kg body weight give one puff in each nostril. Explain inhaler technique & cleaning .

iii. Maintain seizure diary, avoid precipitants & risky sports

iv. Emphasize normal life style & to treat child like other children.

v. Risk of SUDEP (Sudden unexpected death in epilepsy): Debate whether ever patient should be informed, as risk is low & parents gets frightened. However parents of children with difficult to control epilepsy, frequent nocturnal seizures & with underlying neuro-pathological disorders need to be informed. Information must be given by experienced person based on associated risk for type of epilepsy.

Step I	**Seizure Type**
	(Focal, Generalized, Unknown onset)
	↓
Step II	**Epilepsy type**
	(Focal Epilepsy; Generalized epilepsy; Combined generalized and focal epilepsy group; Unknown)
	↓
Step III	**Epilepsy Syndrome**
Identify Etiology: (Structural, Genetic, Metabolic, Infectious, Immune, Unknown) Look for Co-morbidities.	

Figure #1: Framework for multi-level classification of seizure & epilepsy (ILAE, 2017)

Focal onset	**Generalized onset**	**Unknown onset**
-Awareness/Impaired awareness		
Motor Onset		

Automatism; clonic; tonic; Epileptic spasms; myoclonic ; atonic, hyper-kinetic	Tonic clonic; clonic; myoclonic ; epileptic spasms ; & other motor	Tonic clonic; epileptic spasms
Non-motor Onset		
Behavior arrest, emotional	Absences	Behavior arrest
Focal to bilateral		

Table 1: Basic version of ILAE (2017) Classification

Old term	New term
Unconscious	Impaired awareness
Partial	Focal
Simple partial seizure	Focal aware
Complex partial seizure	Focal impaired awareness
Secondary generalized tonic-clonic	Focal to bilateral tonic clonic
Psychic	Cognitive
Arrest, Freeze, Pause, Interruption	Behavior arrest
Grand mal	Generalized tonic clonic
Infantile spasm	Epileptic spasm

Table 2: New terminology in ILAE (2017) classification

Seizure type	Drug	Drugs which can worsen seizure
Focal	OXZ, CBZ, PHT, CLB, LVM, TPM, VPA, Lacosamide	
Generalized tonic clonic	VPA, PHT, CBZ, CLB, LTG, TPM	CBZ, OXZ can worsen myoclonic & absence seizure

Absence	Ethoxamide, VPA, LTG, LEV	OXC, CLB, PHT, Vigabatrin
Myoclonus	VPA, BZD, LTG, TPM, LVM, ZNS	CBZ, LTG
Epileptic spasm	ACTH, Steroids, Vigabatrin	PHT, CBZ

Abbreviations

PHT*-Phenytoin;* ***CBZ****- Carbamazepine;* ***OXZ****- Oxcarbazepine;* ***VPA*** *-Sodium Valporate;* ***LTG****-Lamotrigene;* ***CLB****-Clobazam;* ***TPM****-Topiramate;* ***ZNS****-Zonisamide,* ***BDZ****-Benzodiazepines:* ***LVM****-Levitracetam*

Table 3 : Choice of ASD based on seizure type

Syndrome	Treatment	Avoid Seizure worsening drugs
Childhood Absence Epilepsy (CAE)	Ehosuxamide,VPA ,LTG	OXC, CBZ, PHT, Vigabatrin
BCECT	Infrequent seizures: No treatment Frequent seizures: OXZ, CBZ, PA, LVM, TPM	
Juvenile Myoclonic Epilepsy (JME)	VPA ; TPM,ZNS; In girls prefer LTG/LVM	CBZ, LTG
West Syndrome	Oral steroids , ACTH, Vigabatrin (Drug of choice for tuberous sclerosis)	PHT, CBZ
Severe Myoclonic Epilepsy (Dravet syndrome)	VPA, CLB, TPM, Stiripentol, Ketogenic diet, Fenfluramine	PHT, LTG, OXZ
Lennox Gestaut Syndrome	VPA, LTG, TPM, zonisamide BZD, LTG	CBZ, PHT

Abbreviations:

PHT*-Phenytoin;* ***CBZ****-Carbamazepine;* ***OXZ****-Oxcarbazepine;* ***VPA****-Sodium Valporate;* ***LTG****-Lamotrigene;* ***CLB****-Clobazam;* ***TPM****-Topiramate;* ***ZNS****-Zonisamide;* ***BDZ****-Benzodiazepines;* ***LVM****-Levitracetam*

Table 4 : Choice of ASD based on syndrome type

An Update on Rabies Prevention

Dr. G. P. Kaushal
Associate Professor (Pediatrics),
Baba Sahib Ambedkar Medical College & Hospital
President
Consortium Against Rabies (2020-21)

Rabies is almost always fatal but is a preventable viral disease after exposure, with appropriate, timely and scientifically well established preventive strategies (PEP) in the form of thorough wound washing, local infiltration of RIG (ERIG/HRIG/RmAb) when indicated and IM/ID injection of modern cell culture vaccine as per the schedule. Intradermal administration of vaccine is a safe, immunogenic and cost- and dose-sparing alternative to intramuscular administration. PrEP is recommended for individuals who are at high risk of exposure to rabies virus with limited access to timely, adequate PEP and is a cost effective

Key words:
PEP: Post exposure Prophylaxis, PrEP: Pre exposure Prophylaxis, ERIG: Equine Rabies Immunoglobulin, HRIG : Human Rabies Immunoglobulin, RmAb: Rabies monoclonal Antibodies. IM: Intramuscular, ID: Intradermal

Rabies, a viral zoonotic disease, is almost always fatal but it can be prevented by appropriate measures/ management before and after suspected or proven exposure to the virus. Bites by rabid dogs and cats account for 99% of rabies deaths globally (aprox.55000). An estimated 35172 human deaths per year (59.6% of global deaths) in Asia are due to Dog mediated rabies. India accounts for the most deaths in Asia (59.9% of human rabies deaths) and globally it amounts to 35% of human rabies deaths. These estimates are when there is gross under reporting particularly in younger age group. The cost of PEP is highest in Asia, with estimates up to US$ 1.5 billion per year.

Although all age groups are susceptible, rabies is most common in children below 15 years of age with 30-50% PEP given to children between 5- 14 yrs.

The following information on strategies to prevent rabies after exposure to virus (PEP) or risk of exposure (PrEP) is based on the WHO Expert Consultation on Rabies, third

report. Geneva: World Health Organization; 2018 (WHO Technical Report Series, No. 1012) and the national guidelines. Purpose is to disseminate the current guidelines on management of animal bite and prevention of rabies.

The Disease:

Infection usually occurs from transdermal bite or licks on mucosa by rabid animal. Rarely transmission by aerosol (Bats) and organ transplantation are reported. Virus cannot cross the intact skin. Virus may replicate in muscle or other local tissues after exposure and gains access to motor endplates and motor axons to reach the central nervous system and the brain. Viruses can also enter motor axons in peripheral nerves directly during a penetrating injury. Multiplying rapidly in brain tissues, it moves to various tissues of the body mainly to the salivary glands. Clinically the disease can manifest as **acute encephalitis with Hydrophobia** as an important clinical feature or as **paralytic rabies** in 1/3 of cases that is often misdiagnosed and could be a cause of underreporting of rabies deaths.

Animals Transmitting Rabies Virus:

- **Mammals:** Dogs, Cats, Cattle (Cows, Buffaloes, Camels), animals like monkeys, mongooses, bats, coyotes, foxes, raccoons, bears, skunks.
- Rodents, squirrels, Bats bites are not found to transmit rabies virus in India but a few reports from Sri Lanka mention virus being found in dead squirrels.
- Bites by birds, snakes and fishes do not cause rabies

Stepwise management of an animal bite:

a Wound Care:

- Merely washing all wound sites with copious amount of water and soap for about 15 minutes reduces the risk of developing rabies by more the fifty percent. (Physical method)
- After washing and drying of the wound, chemical agents like savlon, dettol, povidine iodine, spirit, or alcohol can be applied in recommended dilutions (Chemical method).
- Suturing of wound is avoided but if unavoidable wound(s) should first be thoroughly infiltrated with human or equine RIG or RmAb and delayed for several hours to allow diffusion of the immunoglobulin through the tissues before suturing (Biological method).

- Tetanus immunization with TT/Td-vaccine should be administered depending upon past immunization history. Antibiotics may be prescribed if required.

  Further management is as per the WHO categorization of type of exposure as follows:

WHO category of exposure	Symptoms /Signs	Management
Category I	Touching or feeding animals, licks on the skin (i.e. no exposure)	No prophylaxis
Category II	Nibbling of uncovered skin, minor scratches or abrasions without bleeding.	Through wound washing Immediate vaccination
Category III*	Single or multiple transdermal bites or scratches, licks on broken skin, contamination of mucous membranes with saliva from licks, exposures to bats, Or Bite by any wild animal.	Immediate vaccination and administration of RIG are recommended

* Any wound that bleeds is category III

b Post Exposure Prophylaxis

a **Rabies Immunoglobulin (RIG) or Rabies Monoclonal Antibody (RmAb)**

- The dose for **Anti-rabies serum/Equine Rabies Immunoglobulin (ERIG)** is 40 IU/kg body weight); for **Human Rabies Immunoglobulins (HRIG)** is 20 IU/kg body weight. **Rabies monoclonal antibody (RmAb)** is 3.33 IU/kg body weight for Rabishield (SII) and 40 IU/Kg for **Twinrab (Zydus Vaxicare).**
- Local wound infiltration, given to all category III exposure and in immune-compromised individuals Category II exposure also. Given within 7 days of start of PEP vaccine and is useful to protect the individual initially till the active immunity of the body responds to the vaccine administered.
- The calculated amount of RIGs/RmAb should be administered at the site of the wound. If the amount is insufficient to cover infiltration of the wound, it can be diluted with sterile normal so that no wound is left without left without RIG/RmAb infiltration.

Rabies Monoclonal Antibody (RmAb): as on date two products are available as follows:

Rabishield (SII) is a 4th generation recombinant fully human monoclonal antibody developed by Mass Biologics, USA and manufactured in India by SII Pvt. Ltd. This is approved by WHO and DCGI for use. It has the advantages of unlimited availability, no requirement of animal/human serum, negligible side effects and cost effective that HRIG.

Twinrab (Zydus Vaxicare): is the 2nd rabies mAb to receive DCGI approval and is combination of two murine anti-rabies mAb; docaravimab (62-71=3) and miromavimab (M777-16-3). The two mAb bind to and neutralize both rabies and rabies like virus strains isolated from canine and bovine sources, preventing their entry into the neighboring cells. In phase 3 randomized study, comparing twinrab with HRIG, the GMTs of antibodies induced with Twinrab were shown to be non-inferior to antibodies induced by HRIG and a similar adverse effect profile is seen in both the groups.

b Anti Rabies Vaccines

Since their development more than four decades ago, concentrated, purified cell culture and embryonated egg-based rabies vaccines (jointly referred to as CCEEVs) have proved to be safe and effective in preventing rabies.

Human rabies vaccines include:

- Cell culture vaccines: purified chicken embryo vaccine*, purified Vero cell rabies vaccine* and human diploid cell vaccine.
- Duck embryo vaccine.
- Nerve tissue vaccines: WHO recommends discontinuation of nerve tissue vaccines, because they induce severe adverse reactions and are lesser immunogenic.

*Recommended ones

Schedule for PEP

Route	Intramuscular Route (Deltoid/ Anterolateral side of thigh in <2yrs)	Intradermal Route
Dosage	0.5ml or 1 ml (depending on manufacturer instructions	0.1 ml deltoid region (on each side)
Schedule(s)	Day 0,3,7,14-28*	0,3,7, 28**

* WHO guidelines have reduced the number to 4 doses but NCDC guidelines have retained the fifth dose, pending more data from India and the world.

** WHO guidelines have reduced the number of doses from four to three, by doing away with the day 28 dose of the vaccine, whereas NCDC guidelines have retained the day 28 dose, pending more data from India and the world.

- Individuals who have received complete pre-exposure vaccination or post-exposure prophylaxis with a cell culture Vaccine (CCV), 2 IM or ID doses of vaccine administered on days 0 and 3 are enough. RIG is not necessary in such cases.
- Pregnancy and lactation are not contraindications to rabies vaccine prophylaxis.
- Individuals on immunosuppressant therapy like on prolonged/ high dose steroids, chloroquine and pts with HIV/AIDS should receive vaccine by IM route and in case of re-exposure a complete PEP course (Vaccine and RIG) are given as their antibody titers and immune response to vaccine is doubtful.
- Interchangeability of modern rabies vaccine should not be routine practice but when completion of post exposure Prophylaxis (PEP) with the same modern rabies vaccine is not possible, the switch can be done provided that it is one of the WHO recommended cell culture vaccine. Also in case of route change, PEP need not be restarted, and the schedule of the new administration route should be adopted.

Pre-exposure prophylaxis

Recommended for children in whom exposure may remain unnoticed/unremarked, anyone at increased risk of exposure to rabies virus, either by nature of their residence or occupation, or when travelling eg. laboratory staff, veterinarians, animal handlers, wildlife officers with frequent exposure to potentially infected animals, families keeping pets as well as visitors to areas with high risk of rabies.

This can be given with any modern cell derived vaccine with the **advantage of accelerated antibody response to PEP in case of exposure and reduced cost of PEP by omitting the need for RIG/RmAb and reduced number of PEP vaccine doses to two (0,3).**

Route	Intramuscular Route (Deltoid/ anterolateral side of thigh in <2yrs)	Intradermal Route
Dosage	0.5ml or 1 ml (depending on manufacturer instructions	0.1 ml in deltoid region
Schedule(s)	Day 0,7, 21*	0,7,21*

*Day 21 is removed by WHO guideline but still recommended as per the national guidelines.

Role of booster(s): Booster doses are not recommended as a routine practice to everyone who has taken a full course of primary immunization against rabies. Periodic booster injections are recommended for people whose occupation puts

them at continuous or frequent risk of rabies exposure like persons working with live rabies virus in diagnostic laboratories, research laboratories, vaccine production laboratories, at permanent risk of exposure to rabies should have one serum sample taken every six months and booster dose when the titre falls below 0.5 IU/mL. Other professions (veterinarians, animals handlers, wildlife officers etc) working in rabies endemic areas should have one serum sample taken every two years and booster dose when the titer falls below 0.5 IU/mL. Healthy subjects do not require boosters on re-exposure to suspected rabies exposure for up to 3 months after pre-exposure or previous post-exposure prophylaxis. The booster doses (1mL i.m. or 0.1 mL i.d. one site). Individuals who discontinued a PEP series after administrations of at least two doses of vaccine may be considered to have completed their pre-exposure prophylaxis.

Re- exposure management

Route	Intramuscular Route (Deltoid/anterolateral side of thigh in <2yrs)	Intradermal Route
Dosage	0.5ml or 1 ml (depending on manufacturer instructions	0.1 ml ID in deltoid region
Schedule(s) Two visits	Day 0,3	Day 0,3 (at one site)
Single visit		Day 0 (at four sites)

A few of available products in market for rabies prevention (Pre and Post exposure Prophylaxis) are mentioned below for ready reference of the practitioners.

S. No.	Brand	Product	Pharmaceutical Co
Equine RIG Brands			
1	EQUIRAB	Purified Equine RIGs, 5mL vial (300 IU/ mL, 1500 IU Potency)	Bharat Serums and Vaccines Limited, Mumbai
2	Abhayrig	Purified Equine RIGs, 5mL vial (300 IU/ mL, 1500 IU Potency)	Human Biologicals Institute, Hyderabad
3.	VINRIG	As Above	Vins Pharma Pvt. Ltd. Hyderabad

S. No.	Brand	Product	Pharmaceutical Co
Human RIG Brands			
1.	Berirab-P	Human Rabies Immunoglobulins, 150 IU/mL; 2 mL (300 IU) PFS and 5 mL (750 IU) ampoule	CSL, Bharat Serums and Vaccines Limited, Mumbai
2.	SUYA-HRIg	Human Rabies Immunoglobulins, 150 IU/mL; 2 mL (300 IU) ampoule	Prosper Life Sciences, Delhi
Recombinant monoclonal Antibodies (RmAb)			
1.	Rabishield-100	Fully Human Rabies Monoclonal Antibody, 40 IU/mL; 2.5 mL (100 IU) vial	Serum Institute of India Pvt. Ltd., Pune
2.	Rabishield-50	Fully Human Rabies Monoclonal Antibody, 40 IU/mL; 1.25 mL (50 IU) vial	Serum Institute of India Pvt. Ltd., Pune
3.	Twinrab	Murine Monoclonal Antibody cocktail 600IU/ml; 1500IU/2.5ml vial, 1500 IU/5ml	Zydus Vaxxicare
Modern Cell Culture vaccines			
1.	Abhayrab	Purified Vero Cell Rabies Vaccines (PVRV) (0.5 Ml)	Human Biologicals Institute, Hyderabad
2.	Rabipur/ Chirorab	Purified Chick Embryo Cell Vaccine (PCEC) (1 mL)	Sanofi Aventis/Chiron Behring/Bharat Biotech
3.	Rabivax-S	Purified Vero Cell Vaccine (1 mL)	Serum Institute of India, Pune
4.	Vaxirab	Purified Duck Embryo Vaccines (PDEV) (1 mL)	Zydus Alidac Ahmadabad
5.	Vaxirab	Purified Verocell Rabies Vaccines (PVRV) (0.5 mL)	Sanofi Pasteur
6.	Rabio	Purified Verocell Rabies Vaccines (PVRV) (0.5 mL)	Prosper Channel Life Sciences India Pvt. Ltd, Delhi
7.	Rabirix	Chromatographically purified PVRV (0.5 mL)	Bharat Biotech, Hyderabad

Disclaimer: Author does not promote any particular brand of vaccine or immunoglobulin or medical product.

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Paracetamol: Drug Review

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Paracetamol is one of the most commonly used medicine in children. Though its main use is as antipyretic and analgesic across all age-groups, in neonates it may also have a role in medical closure of persistent ductus arteriosus (PDA). Paracetamol is a safe medicine if used in recommended doses. However, safety concerns are raised when dose ingested exceeds the recommended maximum daily dose. Reports of acute hepatic toxicity caused by accidental overdose or ingestion are not uncommon.

Mechanism of Action and Pharmaco-Kinetics

Paracetamol has a central analgesic effect that is mediated through activation of descending serotonergic pathways. Despite the prevalent use of paracetamol for many decades, debate exists about its primary site of action, which may be inhibition of prostaglandin (PG) synthesis or through an active metabolite influencing cannabinoid receptors. Unlike non-steroidal anti-inflammatory drugs (NSAIDS) it has negligible anti-inflammatory action. One possible explanation is that it acts poorly in the presence of peroxides that are generated at the site of inflammation. This is possibly the reason of its negligible anti-platelet action too since hydroperoxide-generating lipoxygenase enzymes are present within the cell (peroxide tone).

Absorption and Distribution

Oral formulations of paracetamol have a higher bioavailability with 70%-90% of dose absorbed. Time for peak serum levels depends on gastric emptying. Food delays absorption, therefore it can be given empty stomach to achieve quick onset of action. It is well absorbed by rectal route, however this has lower bio availability (about 30-40%) than oral route. Paracetamol is widely and quickly distributed in body and rapidly crosses the blood brain barrier.

Metabolism And Elimination

Paracetamol is metabolized in liver predominantly by glucuronidation and sulfation to non-toxic conjugates, that are renally excreted

Usage And Doses

Paracetamol is safe to give to most children. It can be used through neonatal period to infancy for management of fever and pain. Paracetamol is available in many strengths -Drops: 100mg/ml, 125mg/mL and 150mg/mL. Suspension: 120mg / 5ml and 250mg / 5ml, 500mg/5mL. Tablets: 500mg and 650mg. It is also available as rectal formulation. IV paracetamol 1g / 100ml is also available for hospital use.

Oral Use
15mg / kg / dose / 6 hourly
Maximum 60 mg / kg / day

IV Use
10mg / kg / dose
Maximum 50mg / kg / day

Adverse Reactions

Common: Nausea, vomiting, dizziness, pruritis, constipation, hypothermia, skin rash, urticaria

Serious: Thrombocytopenia, hepatotoxicity

Paracetamol induced hepatotoxicity is rare in children when paracetamol is used in recommended doses. Some medications such as anti-epileptic drugs, barbiturates and anti-TB drugs which induce liver enzymes may increase the risk of paracetamol induced hepatotoxicity.

Contraindications

Hepatocellular insufficiency, hepatic failure and hyper sensitivity to paracetamol

Drug Interaction

Barbiturates, carbamazepines and phenytoin may increase clearance of paracetamol and increase its hepatotoxicity. Metoclopramide and domperidone increase absorption of paracetamol.

Paracetamol may enhance anticoagulant effect of Vitamin K analogues, although it is controversial because of discrepancies between observational studies and those in healthy volunteers. Otherwise, no serious adverse drug interactions with therapeutic doses of paracetamol have been confirmed in humans.

Antidote

Acetyl-cystine is the antidote for paracetamol

Paracetamol In Neonates

Paracetamol is commonly used to control mild to moderate pain or to reduce opioid exposure as part of multi-modal analgesia. Paracetamol is the only compound to treat fever in neonates. Paracetamol clearance is lower in neonates than in children. After metabolic conversion, paracetamol is subsequently eliminated by renal route. The main metabolic conversions are conjugation with glucuronic acid and sulphates. In urine of neonates, sulphated paracetamol concentration is higher than glucoronided paracetamol levels suggesting that sulfation prevails over glucuronidation in neonates.

Doses: Loading dose of 20mg / kg followed by 10mg / kg every 6 hours is suggested to achieve a compartment concentration of 11ml / litre in late preterm and term neonates. Aiming for the same target concentration, oral dose of 25-30mg / kg / day in extremely preterm neonates of 30 weeks gestation, 45mg / kg / day in preterm infants of 34 week gestation, 60mg / kg / day in term neonates are suggested.

The abovementioned paracetamol doses for these indications (pain and fever) are well tolerated in neonates and do not result in significant increase in liver enzymes, do not affect blood pressure and have limited effects on heart rate. In contrast, higher doses – 15mg / kg / dose every 6 hours for 5 days suggested in extreme preterm neonates to induce closure of PDA have not yet been sufficiently evaluated for safety and efficacy. It should only be used in hemodynamically significant PDA when indomethacin / ibuprofen is contraindicated, or two courses have failed.

However, more research studies are needed to explore potential causal association between paracetamol exposure during perinatal life and infancy and subsequent development of atopy and bronchial asthma later in life.

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Tetralogy of Fallot: Approach to a Patient

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Definition:

Tetralogy of Fallot is a congenital heart disease (CHD), which clinically present with cyanosis, clubbing and cyanotic spells at neonatal period or subsequently. Without treatment, 20-25 % cases may not survive their first birthday. As suggested by name, it is comprised of 4 major abnormalities-1. large malaligned ventricular septal defect (VSD), usually a perimembranous (74%) or outlet muscular VSD/doubly committed (23%), inlet or AV canal (2%) 2. aortic override; 3. narrow right ventricular outflow tract causing obstruction (RVOTO); 4. right ventricular hypertrophy (Figure-1).

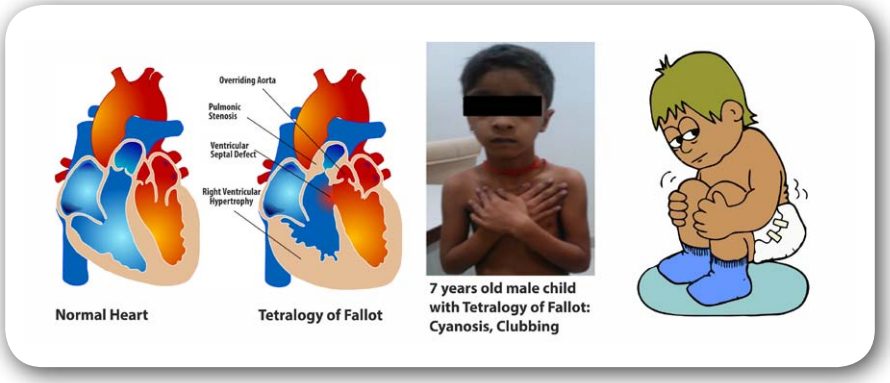

Figure 1: Cartoon of Anatmy of Normal Heart and Tetralogy of Fallot

Hemodynamics of Tetralogy of Fallot

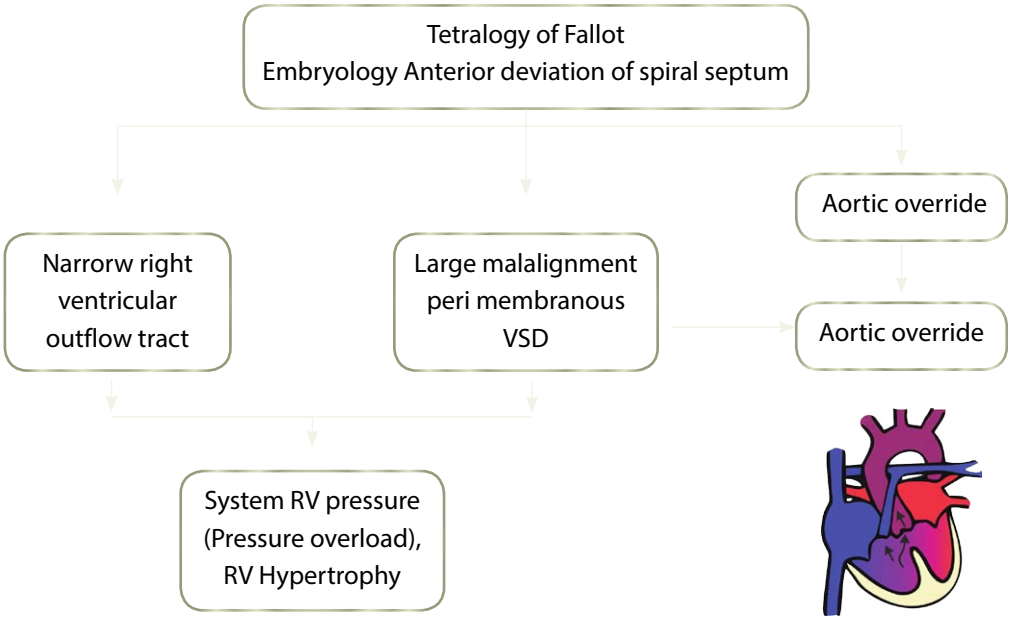

Figure 2: Hemodynamics of Tetralogy of Fallot

Clinical features, Investigations and management plan

History	Investigations	Management
Cyanosis, clubbing and Delayed gross milestones. Cyanotic Spells/squatting. Polycythemia **Nervous system** Seizures cerebral abscess, thrombosis, hypocalcemia (22.11.2Qdeletion) **Rhythm issues** Sup raventricular Or ventricular arrhythmia **Infection** Infective Endocarditis Cerebral abscess **Clinical findings:** RVH, ejection systolic murmur, single heart sound, ejection clicks, continuous murmur-collaterals/PDA (TOFAPV-To-fro-murmur): No precordial murmur but continuous murmur somewhere else (pulmonary atresia/VSD)	Systemic desaturation (Pulse oximeter, arterial blood gas analysis, Hyperoxia test) Haemoglobin/Sepsis screen Blood culture/Ca/Na/K Liver /Kidney function test/blood culture in a sick and febrile child. ECG-Right axis deviation of QRS axis, right ventricular hypertrophy; **X-Ray Chest PA view:** determination of situs, boot shaped heart/conspicuous pulmonary bay, oligemic lung field **Imaging** Echocardiography (Large malaligned VSD, RVH, PS) CT/MR Angio/Cath angiogram: Defines pulmonary arteries, collateral etc. Cath intervention for coiling collaterals.	Medical management: Prostaglandin for duct dependent TOF Oral betablockers (Propranolol 2- 6mg/kg/day in divided doses with Heart rate monitoring) Iron supplement (Target Hemoglobin 13gm%) **Palliative Procedures:** Prostaglandin infusion Ductal stenting (Neonate with duct dependent lesions) RVOT dilatation /stenting BT shunt **Total Intracardiac Correction** VSD closure/RVOT muscular resection-RVOT repair a. Without Transannular patch b. With trans annular patch c. With conduit.

Figure 3: Tetralogy of Fallot-Diagnosis and interventions

Management:

Overall, outcome of TOF depends on:

Severity of right ventricular outflow obstruction, type of VSD, ventricular size & function.

Size of branch pulmonary arteries and source of additional blood supply for lungs.

Presence of Syndrome, other comorbidities.

Medical Management:

a Management of Cyanotic Spell

Tetralogy of Fallot :Management of cyanotic spells

Positioning/calming of baby : knee chest on bed or on lap of mother;		Pharmacological agents Morphine 0.1 mg/kg (subcutaneous or infra muscular.)
Oxygen (nebulized 02)		Injection metoprolol : 0 1mg/kg slow IV, 3-5 mcg/kg/min-continuous infusion; Or
Volume: Normal saline 10-15 ml/Kg		Propranolol- 0.1-0.2 mg/kg intravenously over 5 min.
IV NaHCO3 (Imeq/kg , slow ini)		Esmolol(0 5mg/kg over 1 min then 50mcg/kg/min over 4 min.)
Blood transfusion for anemic child (5-10m1/kg IV over 4-5 hours)		Ketamine- 0.25- 1.0 mg/kg. IV or IM
Ventilation if required		Phenylephrine Hydrochloride- 0.01 mg/kg IV (slowly) or 0.1 mg/kg SC or IM
Surgery or intervention if required		Methoxamine- 0 10mg/kg IV over 5-10 min
		(Antiarrhythmic according to the PALS protocol)

b Intervention

Timing of Intervention at Tetralogy of Fallot

Stable / SPO 2 APprox. 85% or above	Symptomatic despite treatment: or Cyanotic spell	TOF with absent pulm valve	Complex TOF / anomalo us coronary artery
↓	↓	↓	↓
Total repair at 6-12 months of age or earlier (Class I)	Palliation or total repair	Total correction around 1 year	<10 Kg: shunt surgery > 10kg: Total correction + conduit

Interventions:

For a patient with classical TOF, Intervention can be done with less than 5% of mortality or morbidity.

Palliative cath procedure: (When total correction is not possible)

Duct stenting: In baby with severe disease (duct dependence)

Palliative balloon dilatation of RVOT.

Modified BT shunt: If SPO2 of a baby is less than 75% and complete intracardiac repair is not possible then a PTFE tube can be placed between the subclavian artery and pulmonary artery to create a systemic to pulmonary shunt to achieve a systemic saturation of 80 to 90%.

Total intracardiac repair of Tetralogy of Fallot:

Open heart surgery (under general anaesthesia and cardio-pulmonary bypass surgery) is performed and following steps are followed:

VSD Closure with a patch.

Right ventricular outflow tract is repaired -1. By resecting extra muscles; 2. Removing the obstructive valvular tissue; 3. By putting the patch to increase size of RVOT; 4. A transannular patch may be required if annulus is too small; 5. A conduit (pericardium or synthetic material) can be placed if repair of RVOT is not possible. The conduit may or may not have a valve; 6. Main and branch pulmonary arteries are repaired with the patch (pericardial or other synthetic material) if required; 7. If there is any extra source of pulmonary blood flow (PDA, collaterals or BT Shunt), surgically it is removed.

TIP of the MONTH:

Integrating Development monitoring in Pediatric office practice

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Development Surveillance is simple informal checking of child's development, done at every well baby's visit.

Development Screening is documented using a standardised screening tool at specific ages – IAP recommends development screening for all children at 9 months, 18 months, 24/30 months.

Tips to integrate development screening in office practice

1. Plan development screening visit in advance and club with routine immunisation visits especially 9 months, 18 months.
2. Keep ready simple development checklist on table for walk ins or unplanned visits
3. Send a message along with immunisation reminder for development visits.
4. Screening tools like-Trivandrum development Screening tool (0-6 years), Modified checklist for autism in toddlers (MCHAT for 16- 30 months) are freely downloadable and easy to administer.
5. Paramedical staff at reception may be trained to administer these tools.
6. Display posters on early pick up signs of development delays/autism in waiting area.
7. Do not put a diagnosis; if child fails screening test refer for detailed evaluation to a specialist.
8. Remember little extra effort and time can go a long way in changing the course of life of a child.

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Gallery

Important Development Red Flags (0-2 years)	
2 months	No social smile
4 months	No head control
6 months	Not turning to sound, not reaching out for objects
10 months	Not responding to name, No joint attention
12 months	Not standing without support, no babbling, not waving bye
15 months	Not speaking a single meaningful word, not able to follow simple instruction
18 months	Word vocabulary of < 5 meaningful words, not pointing with index finger to indicate needs, not able to point to one body part
24 months	Not able to climb stairs, not able to kick a ball, word vocabulary of <50 words.

***Any red flag present should warrant a detailed evaluation**

Important Links:

For development milestones checklist: www.cdc.gov/ActEarly

For MCHAT forms and filling instructions: www.mchatscreen.com

MDI in Acute Asthma

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Science and technology revolutionize our lives, but memory, tradition and myth frame our response.

Whoever said this could very well have been talking about asthma management, where a modality which has been available for more than three decades and proven to have numerous benefits is still not widely used!

Administration of short acting beta agonists by the inhaled route is the cornerstone of acute asthma management. Salbutamol therapy is traditionally administered in the Emergency Department via nebulization. However, literature suggests that salbutamol delivered via metered-dose inhaler with a spacer is at least as effective in resolution of symptoms as when delivered via nebulization, and MDI+S use has been shown to decrease admission rates, length of stay in the ED, and overall costs.

Challenges in nebulized therapy in Pediatrics

While inhalation therapy is clearly superior and safer as compared to oral and injectable treatments, delivering aerosolized medication has its own challenges. **Nebulization is inefficient as up to 90% of the medication is lost to the tubing, the liquid reservoir and to the environment during exhalation.**[1] Masks can be distressing to young children, resulting in turbulent breathing and compromise in medication delivery. **Further, only a fraction (<5%) of the nominal dose of aerosolized medication actually reaches the distal airways in children, a phenomenon magnified in young children with small airways who tend to take breaths that are rapid, shallow and poorly coordinated.**[2]

Moreover, nebulizers are cumbersome, expensive and require power supply.[1,3]

Sometimes infants may not tolerate this relatively noisy equipment for long treatment periods. Further, improper cleaning may result in nosocomial infections. In a developing country like India, uninterrupted power supply and the reparative and maintenance costs are major concerns.[4]

While the risk of cross-infection to attendants and health care professionals while using nebulization was always known, this has come into sharp focus during the COVID-19 pandemic. Global Initiative for Asthma (GINA 2021) says "Where possible, avoid use of nebulizers due to the risk of transmitting infection to other patients and to healthcare workers".[5] The Australian Asthma Handbook says "The use of nebulisers carries a high risk of transmitting viral infections because they generate aerosol droplets that can spread for several metres and remain airborne for more than 30 minutes".[6]

Advantages of MDI use in children

Metered Dose Inhalers have numerous advantages compared to nebulizers. For optimum effect though, inhalers must always be used with a spacer. Spacers improve the drug delivery significantly by obviating the need for hand-breath coordination and also reduce the oropharyngeal drug deposition thereby reducing the risk of local side effects. **A face mask is required for most children under four years of age or until the child can breathe reproducibly using the spacer mouthpiece.**[5,7]

MDIs with a spacer and a face mask are simpler to use, more compact, and more portable, and take less time to give a treatment than nebulizers.[1,3] Aerosol delivery to wheezing infants via MDI Spacer is effective and a higher percentage of the total amount of salbutamol is delivered than that from a nebulizer.[8]

The relative lung deposition after inhaling 500mcg salbutamol from MDI+S is similar to 5mg from a nebulizer following an acute exacerbation.[9] Lower doses required to achieve a similar effect reduce the risk of side effects. There is also much lesser risk of cross-infection.

Similar to nebulizers a firmly pressed mask over the mouth and nose is required for optimum drug delivery and this can be distressing for young children. The literature suggests, however, that most children can learn to use an MDI+S with appropriate technique.[2] The use of MDI systems in the pediatric emergency department and health centre services helps children learn correct inhalation techniques.[3]

Guidelines/ Recommendations favour MDI + Spacer

International asthma treatment guidelines favour the use of MDI+S over nebulization. GINA 2021 says the most efficient and cost-effective delivery of inhaled SABA in

primary care settings or in the ED is by MDI with spacer with or without a mask depending on the age of the child.5 According to BTS (British Thoracic Society) SIGN (Scottish Intercollegiate Guidelines Networks) 2019 guidelines also endorse MDI and spacer as the preferred method of delivery of SABA in children.[7]

The IAP consensus guidelines for the diagnosis and management of Asthma emphasize: "Inhalers are safer and more effective than nebulisers. Nebulisers are routinely not recommended as they are time consuming, have erratic drug delivery and have chances for higher adverse effects."

Barriers to the use of MDI in acute Asthma

Despite evidence of better drug deposition in the airways while using MDI and spacer, the lower risk of adverse effects and its endorsement by various guidelines, majority of Pediatricians have not adopted MDI+S technology in the treatment of acute asthma.

Several studies have examined perceptions of providers regarding MDI+S use versus nebulizer treatments in pediatric asthma. A meta-analysis by Mudd et al identified four studies that analysed views regarding the use of MDI+S versus nebulizer by pediatric emergency providers (physicians, nurses, respiratory therapists, pharmacists, and administrators). Perceived barriers to implementation that were consistent across studies included concern for increased clinician workload with use of MDI+S, staff apprehension about the effectiveness of MDI+S compared with nebulized medication, anticipated patient and parent discontent with MDI+S use, and overall costs.[10]

Other common barriers identified in our setting are general resistance to change and knowledge gaps in dosing and appropriate technique of using MDI with spacer.

Time and Staffing requirements

The delivery method for medication administration affects staff workflow. The literature suggests that standard administration of nebulized bronchodilators takes more time than administration of these medications via MDI and Spacer even when all actuations or "puffs" of medication are not given simultaneously. In a study from New Zealand, the time required for administration of salbutamol via MDI+S was 1.5 minutes compared to 10 minutes for nebulizer.[11] In a Saudi Arabian study, the mean time for medication preparation by clinical staff decreased by 98% (from 2.05 minutes to 0.3 minutes) and medication delivery time decreased by 48% (from 9.39 minutes to 4.38 minutes) with MDI+S use compared with nebulizer use.[12]

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Cost

Multiple studies have shown significant reductions in cost when MDI+S was used as an alternative to nebulizer treatment. Doan et al reported significant cost savings for hospitals and families pertaining to ED treatment with MDI+S. They demonstrated a higher cost-effectiveness as well.[13] In a 2014 study, the cost reduction per 100 doses was 50% for salbutamol delivered via MDI+S compared to nebulizer.[12] These decreases in cost are despite the fact that, in most cases, MDI+S are more expensive than nebulized drugs. The cost savings are achieved secondary to shorter ED length of stay and decreased likelihood of admission for patients treated with MDI and spacer. An Israeli analysis reported a 63% reduction in cost after MDI+S completely replaced nebulizers in the ED and inpatient units.[14] It is worthwhile to note, however, that this particular study assumes spacer sterilization and reutilization between patients, which may not be feasible at large volume institutions or acceptable under strict infection control policies, especially in these Covid times.

Real world effectiveness in children

A Cochrane Collaboration Review initially published in 1997, and most recently updated in September 2013, reviewed all randomized controlled trials comparing nebulizers with MDI+S in children requiring acute asthma treatment.[15] Compared with nebulizers, use of MDI+S results in a shorter ED length of stay. The mean duration in the emergency department for children given nebulized treatment was 103 minutes, and for children given treatment via spacers 33 minutes less (95% CI -43 to -24 minutes). There was a trend toward lower hospital admission rates for children treated with MDI+S (relative risk, 0.71 [95% CI = 0.47 to 1.08]). Pulse rate was lower for spacer use, mean difference -5% baseline (95% CI -8% to -2%), as was the risk of developing tremor (RR 0.64;95% CI 0.44 to 0.95). Peak flow and forced expiratory volume were similar for the two delivery methods.

The studies reviewed excluded patients with life-threatening asthma (for example those patients considered for ventilation).15

Effectiveness in severe acute asthma

As far back as 1999, Rubilar et al demonstrated that delivery of salbutamol by MDI with a spacer and a face mask results in equivalent improvement, but faster symptom resolution compared to a higher dose of salbutamol delivered by oxygen driven nebulization for treatment of children less than 2 years of age who presented with an acute "moderate to severe" exacerbation of wheezing to the emergency

department.[16]

Leversha et al studied children 1 to 4 years old with moderate to severe acute asthma. MDI+S was evaluated against oxygen driven nebulization and found to be equally effective for clinical score, respiratory rate and oxygen saturation but produced a greater reduction in wheezing. HR increased to a greater degree in the nebulizer group. Fewer children in the spacer group required hospitalization (33% vs 60% in the nebulizer group).[11]

Bernito-Fernandez et al reported in 2003 that more than 97% of acute asthma episodes attended to in the ED can be successfully treated using MDI+S.[17]

Parent and patient preference

Pediatricians are often concerned about patient and parental preference for nebulizer treatments. In an unpublished survey, only about 40% of providers agreed that MDI+S would be preferred by patients and only 26% believed that MDI+S would be preferred by parents. These perceptions, although widespread, are not supported by literature. The meta-analysis by Mudd et al suggests that patients and parents are accepting of MDI+S use.[10] Cotterell et al surveyed parents of patients treated for acute asthma exacerbations via MDI+S and found that ~80% found that MDI+S was easy to use and effective. Of the parents in the sample that reported previous experience with nebulizers, 84% of parents reported that MDI+S was easier to use than nebulizer, and 77% reported that MDI+S was better tolerated by their child. In the same analysis, 82% of patients 8 years of age and older reported they would choose MDI+S over nebulizer.[18]

Leversha et al reported that 86% of children and 85% of parents enrolled in their trial preferred MDI+S over the nebulizer.[11]

Appropriate use of MDI + Spacer in acute Asthma

Depending upon the severity of symptoms, 4 to 10 puffs of a short acting beta agonist (Salbutamol/ Levosalbutamol) is administered using MDI+S every 20minutes for one hour.5 Only one puff is actuated at a time with an interval of one minute between two puffs. The inhaler must be shaken well between each actuation. The child is told to seal his/her lips tightly around the mouth piece. If a mask is being used a good seal must be ensured by placing it firmly around the mouth and nose. The child is asked to take a slow and deep breath and hold for at least six seconds.[19]

Children who are unable to perform controlled breathing or are unable to hold their

breath may perform repeated sufficiently deep tidal breathings to open the valve. In cases where the child is unable to generate enough peak inspiratory flow rates, the valved spacer may be tilted slightly to let the valve fall open due to gravity.19

Inhalation therapy should preferably be given to a child who is calm and not in distress. However, if there is no other option (which is a common scenario in an emergency), it is better to give inhalation therapy rather than not giving it just because the child is crying.19

Conclusions

MDI + Spacer is the most efficient, safe and cost-effective method of administering inhalation therapy to children in acute asthma. Patients given MDI+S respond faster and have fewer side effects as compared to those given nebulization. Majority of acute asthma episodes in children can be managed using MDI+S, be it in the home setting, in our clinics or in the emergency room of a hospital or nursing home. Most children can be trained to use MDI+S effectively.

The proper management of acute asthma using MDI and spacer instils confidence in inhalation therapy and empowers patients to control their Asthma effectively.

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Section III: Activity

IAP Delhi Event Calender 2021

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Date	Academics	Cocurricular
14th-15th January	**E-Rheumatpedia**	*Academics Activity*
Sunday, 24th January	**Raag-n-Sur**	*Cocurricullar Activity*
Thursday, 18th February	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
25th-26th February	**E-Dermapedia**	*Academics Activity*
Sunday, 28th February	**Cyclathon**	*Cocurricullar Activity*
Thursday, 18th March	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Sunday, 21th March	**Downs Syndrome Day**	*Cocurricullar Activity*
25th-26th March	**Gastropedia**	*Academics Activity*
Thursday, 15th April	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Sunday, 25th April	**Geet aur Niratya***	*Cocurricullar Activity*
13th-14th May	**Carcon***	*Academics Activity*
Saturday, 15th May	**IAP Delhi Sports Meet***	*Cocurricullar Activity*
Thursday, 20th May	**IAP Delhi Monthly Clinical Meeting ***	*Academics Activity*
Monday, 31th May	**Case Based CME**	*Cocurricullar Activity*
Saturday, 5th June	**World Environment Day (Plantation by Members)**	*Cocurricullar Activity*
Thursday, 17th June	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Sunday, 20th June	**Antakshari - IAP Delhi Members**	*Academics Activity*
Sunday, 20th June	**Delhi Respicon**	*Academics Activity*
Monday, 21st June	**International Yoga Day Celebrations**	*Cocurricullar Activity*
Monday, 21st June	**IAP Delhi Financial Fitness Class "Make Your Money Work"**	*Cocurricullar Activity*

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IAP Delhi Event Calender 2021

Date	Academics	Cocurricular
Monday, 21st June	**IAP Delhi Financial Fitness Class "Make Your Money Work"**	*Cocurricullar Activity*
24th-25th June	**Neuropedia: Paediatric Neurology**	*Academics Activity*
Saturday, 26th June	**International Day against substance abuse (Book Release)**	*Cocurricullar Activity*
Monday, 28 June	**Haematology CME**	*Academics Activity*
1st-2nd July	**Dysbiosis Module by IAP Delhi**	*Academics Activity*
Thursday, 15th July	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
17th-18th July	**ResRCHcon 2021**	*Academics Activity*
Sunday, 18th July	**Hematopedia**	*Academics Activity*
Thursday, 29th July	**ORS Day *(Book Release on Diarrhea)***	*Cocurricullar Activity*
Thursday, 12th August	**Nephropedia**	*Academics Activity*
Sunday, 1st August	**Breastfeeding Week**	*Cocurricullar Activity*
Thursday, 19th August	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Sunday, 29th August	**IAP Charity Day**	*Cocurricullar Activity*
Thursday, 16th September	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Saturday, 25th September	**National Daughter Day**	*Cocurricullar Activity*
2nd & 3rd October	**PCNI 2021**	*Academics Activity*
14th-15th October	**Adolescon**	*Academics Activity*
Thursday, 21st October	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Sunday, 14th November	**Children's Day**	*Cocurricullar Activity*
Thursday, 18th November	**IAP Delhi Monthly Clinical Meeting**	*Academics Activity*
Sunday, 21st November	**Immunization Update**	*Cocurricullar Activity*
Sunday, 28th November	**IAP ALS Program**	*Cocurricullar Activity*
Sunday, 12th December	**IAP Delhi Annual Day**	*Academics Activity*

** List of events which could not be done due to COVID19 pandemic*

IAP Delhi May 2021 Activity Report

1	***Thalassemia*** ***Sunday, 23 May, 2021*** ***(Online Webinar by IAP Delhi)*** IAP Delhi in association with Thalassemia India Society
2	***COWIN UDAY*** ***30-31, May 2021 (Online Webinar by IAP Delhi)*** ***Under CIAP Module*** **IAP Delhi** in association with **IAP East Delhi** and **IAP South Delhi** *conducted CIAP Module of COWIN UDAY to understand the latest science of Covid cases in adults and children*
3	***PRAN DHYAN SHIVIR*** ***Sunday, 6 June, 2021*** by ***Art of Living Teacher Ajay Arora ji*** was conducted to heal the ***mental setbacks of Pandemic lockdown*** by having ***rejuvenating sessions of Yoga and Meditation.***

Dr Manish Gupta,
General Secretary, IAP Delhi 2021

IAP Delhi Upcoming Events

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Date	Event Name
Thursday, 17 June, 2021	**IAP Delhi Monthly Clinical Meeting**
Sunday, 20 June, 2021 Timing 1700-1800 hrs	**Antakshari Event** for IAP Delhi Members
Monday, 21 June, 2021	**International Yoga Day celebrations** Online Yoga Class
Monday, 21 June, 2021 Timing 1500 hrs	**"Make Your Money Work"** IAP Delhi Financial Fitness Class
24th-25th June Timing 1400-1700 hrs	**Neuropedia: Paediatric Neurology Basics**
Monday, 28 June, 2021	**Haematology CME on Current Perspective of ITP**
1st-2nd July, 2021	**Dysbiosis Module** Organized by IAP Delhi

Dr Manish Gupta,
General Secretary, IAP Delhi 2021

Journal Clippings

1 Efficacy of NVX-CoV2373 Covid-19 Vaccine against the B.1.351 Variant and Efficacy of the ChAdOx1 nCoV-19 Covid-19 Vaccine against the B.1.351 variant (NEJM, 2021)

Efficacy studies of NVX-CoV2373 Covid-19 Vaccine (Novavax ®) and ChAdOx1 nCoV-19 Covid-19 Vaccine (AZD1222) (marketed as Covishield ® in India) against emerging SARS-CoV-2 variant of concern, the B.1.351 (501Y.V2) variant first identified in South Africa have been published in recent issues of NEJM. Shinde et al studied the NVX-CoV2373 vaccine. In this phase 2a–b trial in South Africa, human immunodeficiency virus (HIV)–negative adults between the ages of 18 and 84 years or medically stable HIV-positive participants between the ages of 18 and 64 years were enrolled. The primary end points were safety and vaccine efficacy against laboratory-confirmed symptomatic Covid-19 at 7 days or more after the second dose among participants without previous SARS-CoV-2 infection. Among 2684 baseline seronegative participants (94% HIV-negative and 6% HIV-positive), predominantly mild-to-moderate Covid-19 developed in 15 participants in the vaccine group and in 29 in the placebo group (vaccine efficacy, 49.4%; 95% confidence interval [CI], 6.1 to 72.8). Vaccine efficacy among HIV-negative participants was 60.1% (95% CI, 19.9 to 80.1). Of 41 sequenced isolates, 38 (92.7%) were the B.1.351 variant. Post hoc vaccine efficacy against B.1.351 was 51.0% (95% CI, −0.6 to 76.2) among the HIV-negative participants. There was one case of severe disease in placebo group and nil in vaccine group. Preliminary local and systemic reactogenicity events were more common in the vaccine group; serious adverse events were rare in both groups.

Madhi et al conducted the trial of ChAdOx1 vaccine on 2026 participants 18 to less than 65 years. The primary end points were safety and efficacy of the vaccine against laboratory-confirmed symptomatic coronavirus 2019 illness (Covid-19) more than 14 days after the second dose. In the primary end-point analysis, mild-to-moderate Covid-19 developed in 23 of 717 placebo recipients (3.2%) and in 19 of 750 vaccine recipients (2.5%), for an efficacy of 21.9% (95% confidence interval [CI], −49.9 to 59.8). Among the 42 participants with Covid-19, 39 cases (95.1% of 41 with sequencing data) were caused by the B.1.351 variant; vaccine efficacy against this variant, analyzed as a secondary end point, was 10.4% (95% CI, −76.8 to 54.8). However, the good point was that here were no cases of severe disease or hospitalization in either group. The incidence of serious adverse events was balanced between the vaccine and placebo groups.

https://www.nejm.org/doi/full/10.1056/NEJMoa2103055/

https://www.nejm.org/doi/full/10.1056/NEJMoa2102214

2 Feeding during neonatal therapeutic hypothermia, assessed using routinely collected National Neonatal Research Database data: a retrospective, UK population-based cohort study (Lancet, 2021)

Therapeutic hypothermia is standard of care in high-income countries for babies born with signs of hypoxic ischaemic encephalopathy, but optimal feeding during treatment

is uncertain and practice is variable. This population-based retrospective cohort study by Gale et al aimed to assess the association between feeding during therapeutic hypothermia and clinically important outcomes (severe necrotising enterocolitis, late-onset infection, survival to discharge, measures of breastmilk feeding, and length of stay in neonatal unit). Out of 6030 babies who received therapeutic hypothermia, 1873 (31•1%) were fed during treatment. Seven (0•1%) babies were diagnosed with severe necrotising enterocolitis and the number was too small for further analyses. So, 3236 (53•7%) babies were selected for the matched feeding analysis (1618 pairs), achieving a good balance for all recorded background variables. Pragmatically defined necrotising enterocolitis was rare in both groups (incidence 0•5%, 95% CI 0•2–0•9] in the fed group vs 1•1% [0•7–1•4] in the unfed group). The enterally fed group had fewer pragmatically defined late-onset infections (difference −11•6% [95% CI −14•0 to −9•3]; p<0•0001), higher survival to discharge (5•2% [3•9–6•6]; p<0•0001), higher proportion of breastfeeding at discharge (8•0% [5•1–10•8]; p<0•0001), and shorter neonatal unit stays (−2•2 [−3•0 to −1•2] days; p<0•0001) compared with the unfed group. Thus, it was demonstrated that necrotising enterocolitis is rare in babies receiving therapeutic hypothermia. Enteral feeding during hypothermia is safe and associated with beneficial outcomes compared with not feeding, although residual confounding could not be completely ruled out

https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(21)00026-2

3 *Reduced inflammatory responses to SARS-CoV-2 infection in children presenting to hospital with COVID-19 in China (Lancet, 2021)*

Qian et al studied the inflammatory response to COVID-19 infection in hospitalized children by analysing the medical records of such 127 laboratory-confirmed COVID-19 patients aged 1 month to 16 years retrospectively. They found that children admitted to hospital with COVID-19 were more likely to be male (67.7%) and the median age was 7.3 [IQR 4.9] years. All but one patient with severe disease was aged under 2 and the majority (5/7) had significant co-morbidities. Despite 53% having viral pneumonia on computed tomography (CT) scanning only 2 patients had low lymphocyte counts and no differences were observed in the levels of plasma proinflammatory cytokines, including interleukin (IL)-2, IL-4, IL-6, tumour necrosis factor (TNF)- αα , and interferon (IFN)- γγ between patients with mild, moderate or severe disease. Thus, it demonstrates that the immune responses of children to COVID-19 infection is significantly different from that seen in adults and that SARS-CoV-2 does not trigger a robust inflammatory response or 'cytokine storm' in children with COVID-19. Tis may underlie the generally better outcomes seen in children with this disease.

https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00111-5

Journal Clippings

4 Changes in Neurodevelopmental Outcomes From Age 2 to 10 Years for Children Born Extremely Preterm (Pediatrics, 2021)

Evidence-based care of extremely preterm infants (<28 weeks' gestation) depends heavily on research in which a primary outcome is infant neurodevelopmental impairment (NDI), but does NDI in infancy predicts long-term NDI? Taylor et al tried to find the answer by following up such babies for upto 10 years of age. Of 1506 infants, 80% survived. Data sufficient to classify severity of NDI at both 2 and 10 years were available for 67% of survivors (n = 802). Among children classified as having moderate to severe NDI at 2 years, 63% had none to mild NDI at 10 years; among children classified as having profound NDI at 2 years, 36% had none to mild NDI at 10 years. Cohen's κ statistic indicated minimal to fair agreement between NDI at 2 and 10 years (0.34, P < .001). NDI in infancy, as defined in this study, only weakly predicts NDI in middle childhood. Thus, this study gives a very bright message for pediatricians and parents of extremely preterm babies: one-third of surviving children classified as having profound NDI and nearly two-thirds of those classified as having moderate to severe NDI at 2 years had none to mild NDI at 10 years.

 Read the full artical

https://pediatrics.aappublications.org/content/147/5/e2020001040

5 BCG-induced non-specific effects on heterologous infectious disease in Ugandan neonates: an investigator-blind randomised controlled trial (The Lancet Infectious Diseases, 2021)

This interestingly designed study by Prentice et al tried to find if BCG induces non specific effect on infections other than tuberculosis. Participants were recruited at birth and randomly assigned (280 babies in each group) to receive standard dose BCG 1331 (BCG-Danish) on the day of birth or at age 6 weeks. Investigators and clinicians were masked to group assignment; parents were not masked. Participants were clinically followed up to age 10 weeks and contributed blood samples to one of three immunological sub studies. The primary clinical outcome was physician-diagnosed non-tuberculous infectious disease incidence. Primary immunological outcomes were histone trimethylation at the promoter region of TNF, IL6, and IL1B; ex-vivo production of TNF, IL-6, IL-1β, IL-10, and IFNγ after heterologous stimulation; and transferrin saturation and hepcidin levels. During the first 6 weeks of life before the infants in the delayed vaccination group received BCG vaccination, physician-diagnosed non-tuberculous infectious disease incidence was lower in infants in the BCG at birth group than in the delayed group (98 presentations in the BCG at birth group vs 129 in the delayed BCG group; hazard ratio [HR] 0•71 [95% CI 0•53–0•95], p=0•023). After BCG in the delayed group (ie, during the age 6–10 weeks follow-up), there was no significant difference in non-tuberculous infectious disease incidence between the groups (88 presentations vs 76 presentations; HR 1•10 [0•87–1•40], p=0•62). BCG at birth inhibited the increase in histone trimethylation at the TNF promoter in peripheral blood mononuclear cells occurring in the first 6 weeks of life. H3K4me3 geometric mean fold-increases were 3•1 times lower at the TNF promoter (p=0•018), 2•5 times lower at the IL6 promoter (p=0•20), and 3•1 times low-

Journal Clippings

er at the IL1B promoter (p=0·082) and H3K9me3 geometric mean fold-increases were 8·9 times lower at the TNF promoter (p=0·0046), 1·2 times lower at the IL6 promoter (p=0·75), and 4·6 times lower at the IL1B promoter (p=0·068), in BCG-vaccinated (BCG at birth group) versus BCG-naive (delayed BCG group) infants. No clear effect of BCG on ex-vivo production of TNF, IL-6, IL-1β, IL-10, and IFNγ after heterologous stimulation, or transferrin saturation and hepcidin concentration, was detected (geometric mean ratios between 0·68 and 1·68; p≥0·038 for all comparisons). Thus, this study showed that BCG vaccination protects against non-tuberculous infectious disease during the neonatal period, in addition to having tuberculosis-specific effects. Prioritisation of BCG on the first day of life in high-mortality settings might have significant public-health benefits through reductions in all-cause infectious morbidity and mortality.

https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30653-8

Complied by Dr Puneet Kumar

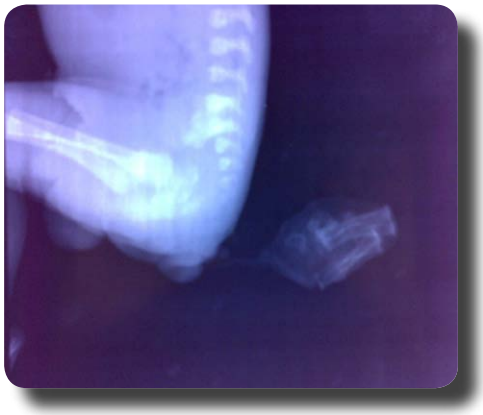
Photo Quiz March Answer 2021

Question *1.6 yrs old presented with slow growth before and after birth; intellectual disability and abnormalities of bones in the arms, hands, and fingers. Name the disorder and what is the life expectancy in this disorder?*

Answer ***Cornelia de Lange Syndrome, near normal life expectancy***

Correct Answers by **Dr Sanjeev Aggarwal, Dr Sushil Saroha**
Dr Nitish Lavania, Dr Manoj Anand Gupta

X-Ray Quiz March Answer 2021



Answer ***Sacrococcygeal Teratoma***
(Pedunculated with skin tag attached to perineum)

Contributed by Dr Pankaj Garg
Sr. Consultant, Department of Neonatology,
Sir Ganga Ram Hospital, New Delhi

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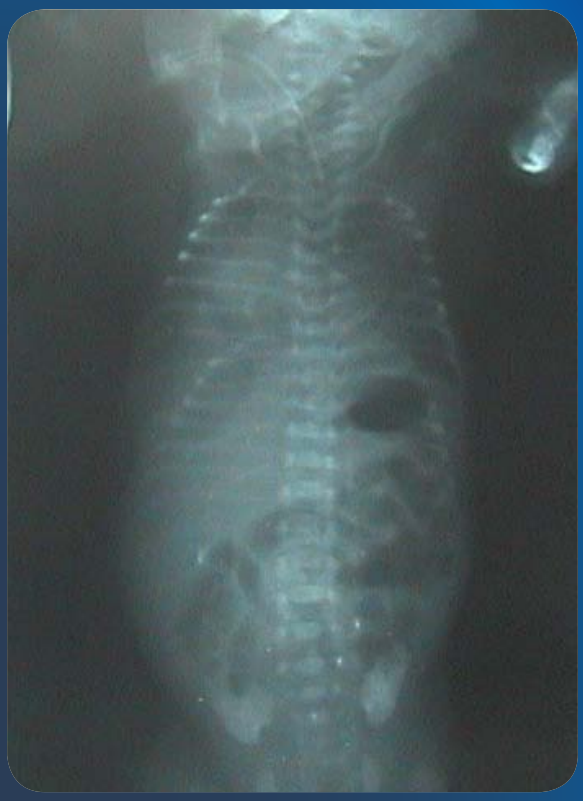
Photo Quiz May 2021

Identify this neonatal condition and what is the prognosis?

X-Ray Quiz May 2021



Spot diagnosis of this Xray

Contributed by Dr Pankaj Garg
Sr. Consultant, Department of Neonatology,
Sir Ganga Ram Hospital, New Delhi

Please send correct answers photoshot with your name on IAP Delhi eMail iapdelhi2@gmail.com.
We will be publishing names as well as correct answers in next e Journal Delhi Pediatrics (XXXVIII No. 6)

Down the Memory Lane

Same roads, same lanes
But all looks in vain.
We travelled together,
Today we are again together.
What has changed?
Road is the same,
Old twists and turns,
But Life has changed
With new twists and turns.
We are again together
But not with each other.
Are we strangers
Or roads have changed.
Only our time has changed,
And we are again together
But only to travel
All the way, same lane
But only down the
memory lane

कुदरत से सीख

कुदरत क़हर तो डालती है
लेकिन जैसे माँ मारती है।
हमें कुछ सिखाने के लिए।
पर हम तो ज़िद्दी बच्चे हैं
सीखते हम कहाँ है।
पहली लहर में किए कई वादे
बदलेंगे हम अपने इरादे।
माँ ने तो माफ़ कर दिया
लेकिन इंसान सब भूल गया।
फिर वही भीड़ लगाई
हम सब ने भी खूब पार्टी मनाई।
जो कुदरत को ना भायी।
फिर दूसरी लहर आई।
बेहिसाब तबाही मचाई
क्या अब भी हमें समझ आई
लगता तो नहीं मेरे भाई।
माँ ने फिर भी माफ़ किया
और कुछ आराम भी दिया।
प्यार की बारिश आज बरसाई
भीगा मन भीगा तन
और दिल में ठंडक आई।
अब भी सीख लो मेरे भाई
नहीं तो तीसरी लहर भी आई।

Dr Prashant Seth

IAP Delhi Membership Form

Name of the Applicant						Photograph
Designation		Date of Birth				
Email Id		Sex: ☐ Male ☐ Female				
Postal Address for Communications						
Tel Residence		Office		Mob		
Name of Zonal Branch you would like to join ☐ Central ☐ East ☐ West ☐ North ☐ South: Whether Central IAP member, if so Membership No:						

No	Educational Qualification	Name of the University	Qualifying Year
1			
2			
3			
4			

Medical Council Reg. No	Reg. Authority (e.g. MCI/State Medical Council)
Name & Address of the Proposer	
Membership No. of the Proposer	Signature
Name & Address of the Seconder	
Membership No. of the Seconder	Signature
Declaration : I hereby declare that I have never been arrested/prosecuted and convicted by a criminal court or involved in any case registered by the police.	
Place & Date	Signature of the Applicant

Membership Category	Fee	Admission	Total Amount Payable
Life	₹ 2,000/-	₹ 100/-	₹ 2,100/-
Associate Life	₹ 2,000/-	₹ 100/-	₹ 2,100/-

Cash/Local Cheque/may be drawn in favor of "Indian Academy of Pediatrics Delhi" payable at New Delhi.

For office use only

Payment Details Received		Rupees					
by Cash/Local Cheque/DD No		Date		Bank			
Receipt No		Date			General Secretary / Treasurer		

Note: Please submit self-attested photocopies of Qualification & Registration Certificate & One Passport size photograph.

Delhi IAP Membership Link: *https://www.iapdelhi.org/become-a-member*

Central IAP Membership Form

Personal Details													
Name of the Applicant													
			(Surname)				(First Name)				(Middle Name)		
Date of Birth									Sex: ☐ Male ☐ Female				
Complete Postal Address for Communications													
Postal Pin		City			State			Nationality					
Registered Mobile No					Alternate Mobile								
Registered Email					Alternate Email								
IAP State Branch			IAP Dist./City/Local Branch										

Qualification			
Medical / Pediatric Qualification	Name of the University	Qualifying Year	Registration with State Medical Council or Medical Council of India

Other Details	
IAP membership no. and name of the Proposer	
	Signature
IAP membership no. and name of the Seconder	
	Signature
Place	
Date	(Signature of the Applicant) (Use black ink pen)

Please provide following information for IAP Photo Identity Card. Please attach a stamp size photograph (3x2.5 cms) with this application.							
Doctor's Name				Mobile No			
Allergies			Emergency Medications			Blood Group	

Central IAP Membership Link: *https://iapindia.org/registration/member-registration*

Central IAP Membership Form

The Society provides-

- *Facilities to Students, Scholars and Institutions for the study of or Research in Pediatrics in any of its aspects by way of scholarships, fellowships, grants, endowments, etc.*
- *Either through itself or in cooperation with other bodies or persons fellowships, prizes, certificates, diplomas of proficiency in the science of Pediatrics and conduct such tests, examinations or other scrutiny as may be prescribed from time to time.*
- *Free of cost or at subsidized cost its official journals, books, periodicals or publications on pediatrics and allied subjects which the society thinks is desirable for the promotion of its objects.*
- *Opportunity to its member to participate in Conferences, Lectures, Meetings, Seminars, Symposia, Workshops, Continuing Medical Education Programs, etc.*
- *Opportunity to become members of its Branches / Subspecialty Chapters / Groups / Cells / Committees.*

Affiliations / Collaboration-

The Society is affiliated to:

i International Pediatric Association (IPA)
ii International Society of Tropical Pediatrics (ISTP)
iii American Academy of Pediatrics (AAP)
iv Asian Pacific Pediatric Association (APPA)
v Asian Society for Pediatric Infectious Disease (ASPID)
vi South Asia Pediatric Association (SAPA)
vii Royal College of Pediatrics and Child Health (RCPCH)

Categories of Membership-

1 *Life Member: Life Membership is granted to any person who is a residential Indian citizen possessing MBBS or equivalent degree in Modern Medicine recognized by Medical Council of India (MCI) and is holding a diploma/ degree in pediatrics (such as MD Ped., DNB Ped., DCH) recognized by Medical Council of India (MCI) or any equivalent Nation Statutory Body formed by Government of India.*

2 *Associate Life Member is granted to any person possessing MBBS or equivalent degree recognized by Medical Council of India (MCI) or any equivalent National Statutory Body formed by Government of India.*

How to Apply for Membership-

Application should be made in the prescribed form. Along with the application for membership of IAP, photo copies of the following documents should be submitted-

- *Photo copies of the M.B.B.S. & Post Graduation Certificates as (as per degrees listed in your application).*
- *Photo copies of the degrees registration certificates with State Medical Council OR Medical Council of India (as the case may be).*
- *ID Proof with Photo : Aadhar Card / Passport / Voter ID / PAN Card*

Membership Fee-

The Membership Fee Structure is as follows:

Category of Membership	*Admission Fee*	*Membership Fee*	*Total Amount Payable*
Life	₹ ***500****/-*	₹ ***9,500****/-*	₹ ***10,000****/-*
Associate Life	₹ ***500****/-*	₹ ***9,500****/-*	₹ ***10,000****/-*

The Membership Fee should be paid by a crossed bank draft / at par cheque drawn in favor of **"INDIAN ACADEMY OF PEDIATRICS"** *payable at Mumbai or NEFT.*
Bank details: **BANK OF BARODA**, *Branch-Juinagar, Navi Mumbai*
IFSC Code: **BARB0JUINAG** *(Fifth character is Zero) '*
Current A/c No. ***42080200000253***.

IAP Guidelines for pediatric skincare

state that the newborn skin undergoes various structural and functional changes[1*]

Use of appropriate evidence-based skincare practices are important[2]

Protect the infant skin barrier function with safe, appropriate, and evidence-based products

Johnson's® CHOOSE gentle™

CLINICALLY mildness PROVEN®

Evidence-based skincare regimen

Cleansing regimen

As mild as pure water to maintain the skin barrier function[3,4]

Helps maintain the skin barrier function[5]

Moisturizing regimen

Improves the skin barrier integrity[6,7]

Helps enhance the skin barrier function for moisture retention[8]