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NEUROLOGY

FEBRILE FITS

***Kumaresan G**

Abstract: *Febrile fits is a common condition seen in day to day practice. The diagnosis is mainly clinical and there is limited indications for investigations. EEG often adds to confusion and is best avoided. The role of genetics is being recognised. Intracranial infections, febrile myoclonus, epileptic syndromes presenting initially as febrile seizures are to be considered in the differential diagnosis. Long term anti-convulsants should be avoided except in rare situations. Intermittent prophylaxis with clobazam is useful in reducing recurrences and parental anxiety.*

Keywords: *Febrile fits, Prognosis, Genetics, Differential diagnosis, Intermittent clobazam.*

Points to Remember

- ***Febrile fits is a benign age related, self limiting condition.***
- ***Clinical observation to exclude other conditions is most important than investigations.***
- ***Early therapy to stop on-going seizure is important.***
- ***Hippocampal abnormalities can be both cause and effect of febrile fits in different situations.***
- ***Intermittent therapy is useful to minimise recurrences and parental anxiety.***
- ***Restrict use of continuous anti-epileptic drugs.***

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NEUROLOGY

STROKE IN CHILDREN

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Abstract: *Pediatric stroke is an acute cerebrovascular event that occurs in children after 28 days of life up to 18 years of age. Pediatric stroke results in significant morbidity and mortality. Ischemic stroke can be due to arterial ischemia or venous sinus thrombosis. Hemorrhagic stroke is either due to non-traumatic, intra-parenchymal hemorrhage or subarachnoid hemorrhage. In young children, the symptoms could be non-specific. Stroke like conditions are very common, hence neuroimaging is mandatory for all cases of suspected stroke. Clinical awareness and recognition is crucial for diagnosis to ensure prompt management for better outcome.*

Keywords: *Stroke, Children, Pediatric stroke.*

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Points to Remember

- ***Consider stroke in any child presenting with acute onset hemiparesis or focal deficit, change in mental status, headache, seizure or speech disturbance.***
- ***MRI brain with MRA is the investigation of choice, but it is recommended at least that a CT brain is performed within one hour of arrival at hospital in every child. MR venography is done if cerebral venous sinus thrombosis is suspected.***
- ***Aspirin has to be started in all cases of arterial ischemic stroke as soon as possible in the absence of contraindications except arterial dissection, cardio-embolic stroke and hyper-coagulable states.***
- ***In CVST as well as in AIS caused by arterial dissection, cardio-embolic stroke and hyper-coagulable states, anticoagulation using LMWH (enoxaparin) / un-fractionated heparin or oral warfarin is used.***
- ***Role of thrombolysis in pediatric age group is controversial, however, there is growing evidence and looks promising.***

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NEUROLOGY

ACUTE DISSEMINATED ENCEPHALOMYELITIS IN CHILDREN

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Abstract: *Acute disseminated encephalomyelitis is a demyelinating inflammatory disorder characterized clinically by acute-onset polyfocal neurologic deficits and encephalopathy and fluffy white matter lesions radiologically. Antecedent factors include infections, vaccinations and others. Usually, a monophasic illness, recurrences should raise a suspicion of a relapsing disorder such as myelin oligodendrocyte glycoprotein associated demyelination or multiple sclerosis. Investigations are warranted to rule out other causes of encephalopathy. Management includes immunomodulation with high dose pulse methylprednisolone, intravenous immunoglobulin and / or plasmapheresis. Prognosis depends on the recovery after the acute stage and the risk of recurrent demyelination.*

Keywords: *Demyelination, Acute disseminated encephalomyelitis, Myelin oligodendrocyte glycoprotein associated demyelination, Neuroinflammation.*

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Points to Remember

- ***ADEM is an inflammatory disorder of the brain, characterized by acute-onset polyfocal neurologic deficits and encephalopathy.***
- ***Fluffy white matter demyelinating lesions are the typical MRI findings.***
- ***ADEM is monophasic, but it may be the first presentation of related inflammatory disorders such as MOG associated demyelination.***
- ***Treatment includes immunomodulation with pulse steroids resulting in a brisk improvement in most children.***
- ***IVIG is initiated if there is no clinical improvement within seven days of completing pulse steroids.***

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NEUROLOGY

METABOLIC ENCEPHALOPATHIES

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Abstract: *The etiologies of metabolic encephalopathy are often diverse in children. Encephalopathy could result from lack of glucose, vitamin cofactors or oxygen and end organ failure. Inborn errors of metabolism, hypoglycemia, dyselectrolytemia, endocrine disorders and Reye syndrome are the reported causes of metabolic encephalopathies in children and adolescents. The clinical manifestations, biochemical parameters and radiological findings vary according to the etiology. Early diagnosis and management lead to reversal of symptoms and can prevent long-term neurological sequelae.*

Keywords: *Metabolic encephalopathy, Inborn error of metabolism, Osmotic demyelination syndrome, Hepatic encephalopathy, Uremic encephalopathy.*

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Points to Remember

- ***Metabolic encephalopathy should be suspected in any child with altered consciousness after excluding CNS infection, structural disorders, toxin ingestion and trauma.***
- ***Organ or system failure like hepatic encephalopathy, hypoxia, dyselectrolytemia and endocrine dysfunction are responsible for metabolic encephalopathy.***
- ***Underlying etiologies are diverse which can be narrowed down by recognizing the clinical clues.***
- ***Management includes acute stabilization and specific measures based on etiology including organ support.***

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NEUROLOGY

ACUTE FLACCID PARALYSIS BEYOND POLIO- A CASE BASED APPROACH

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Abstract: *Acute flaccid paralysis is a complex clinical syndrome that requires immediate and careful evaluation for making a diagnoses. Each case of acute flaccid paralysis is an emergency from both clinical as well as public health perspective. The precise knowledge of the etiology, underlying pathophysiology and concurrent changes have profound implications in the treatment and prognosis. With the eradication of polio, Gullian Barrie Syndrome has become the major acute flaccid paralysis. Seasonal occurrence of Gullain Barrie Syndrome with spurt of viral fever is also seen. However, the clinical features of polio must be taught to the younger residents since imported or vaccine associated polio can still occur. Better usage of Magnetiic resonance imaging scanning will help in establishing the diagnosis. Acute management of such patient with acute flaccid paralysis due to different causes in intensive care unit has become a necessity. Based on severity IVIg for Gullain Barrie Syndrome and Methyl prednisolone for transverse myelitis are now accepted protocols. We are still in the process of consolidating the eradication of polio by the endgame strategy from 2019-2023.*

Keywords: *Acute flaccid paralysis, Guillain-Barre Syndrome, Lower motor neuron localization, Transverse myelitis*

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Points to Remember

- ***Clinical features of polio must be taught to the younger residents as imported or vaccine associated polio can still occur***
- ***GBS requires prompt diagnosis and management and it is the major AFP now because of the spurt of various viral infections.***
- ***Transverse myelitis (TM) and traumatic neuritis are the other common causes of AFP.***
- ***TM with long segment involvement may be mistaken for GBS because of lack of sensory level and prolonged spinal shock which may be due to enterovirus related TM, or NMO (neuromyelitis optica).***
- ***In TM preservation of dorsal column (joint position sensation) → Anterior cord syndrome → Anterior spinal artery occlusion***
- ***Rabies can present with features of GBS.***

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NEUROLOGY

NEWER INTERVENTIONS IN EPILEPSY MANAGEMENT

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Abstract: *Epilepsy is a global issue affecting about 70 million people among the world population. Nearly 80% of them live in low and middle-income countries with limited resources. Although highly advanced treatment is available in some countries, up to 90% of people with epilepsy are not adequately treated or are not treated with conventional antiepileptic therapy in resource limited countries.*

This review will highlight a few of the newer advances in management of epilepsy in children. They include pharmacological interventions, ketogenic diet, early genetic diagnosis and newer model multi-disciplinary team management of children with epilepsy.

Keywords: *Epilepsy, Treatment, Advances.*

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Points to Remember

- ***Epilepsy in children can differ from epilepsy in adults both in seizure type and epilepsy syndrome.***
- ***Medical management of epilepsy is complex and has to be tailored to the individual patient. Monotherapy is generally preferred.***
- ***If the monotherapy fails, it is considered preferable to try alternative monotherapy.***
- ***Children who continue to have seizures on monotherapy are prescribed a long term second drug in addition.***
- ***Pharmacotherapy with newer drugs and nonpharmacological therapy like ketogenic diet useful in certain resistant epilepsy.***
- ***Genetic testing aids in diagnosis.***

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NEUROLOGY

NEUROIMAGING

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Abstract: *Availability of neuroimaging facilities has made the evaluation of neurological problems easier in the last few decades. Computed tomography scan of brain is the initial choice in very sick children because of its wider availability, faster turnaround time and lower cost. Cranial ultrasonography is an important modality in the follow up of infants in the postnatal period, particulary in the evaluation of hypoxic ischemic encephalopathy, subependymal- periventricular- intraventricular hemorrhage and hydrocephalus. It is used as a point of care investigation by neonatologists. Absence of radiation exposure and precision makes magnetic resonance imaging the modality of choice in emergency situations. But the disadvantages are the need for sedation or brief anaesthesia, longer procedural time and cost. But benefits outweigh the disadvantages and additional tools like Magnetic resonance angiography, Magnetic resonance venography and Magnetic resonance spectroscopy add precious information for further evaluation.*

Keywords: *Neuroimaging, Cranial ultrasonography, CT, MRI, MRV, MRA, MRS.*

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Points to Remember

- ***Neuroimaging is an invaluable tool in the evaluation of neurological problems.***
- ***Cranial ultrasonography is the most frequently used neuroimaging modality in the perinatal period, particulary in the evaluation of hypoxic ischemic encephalopathy, subependymal- periventricular-intraventricular hemorrhage and hydrocephalus.***
- ***CT brain is the first imaging modality in unstable patients as it is widely available for emergencies, has shorter imaging time and lower cost. However, CT is generally suboptimal for imaging of structures in the posterior fossa and brain stem.***
- ***MRI is an indispensable tool in diverse CNS problems such as developmental anomalies, infections, neurocutaneous syndromes, demyelination and metabolic disorders.***
- ***Constraints with MRI are the need for sedation in young infants and its contraindication in the presence of metallic devices and implants.***
- ***MRA, MRV and MRS are additional facilities useful in identifying vascular and metabolic pathology.***

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NEUROLOGY

DIAGNOSTIC NEUROPHYSIOLOGY IN CHILDREN

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Abstract: *Neurophysiological tests are an extension of the clinical examination and should be interpreted in the overall clinical context. In children they are often misinterpreted due to lack of experience. Normal EEG does not rule out epilepsy and an abnormal EEG per se is not diagnostic of epilepsy. EEG is not a confirmatory test but rather supports clinical diagnosis of epilepsy. Routine interictal EEG does not distinguish between epilepsy and epilepsy mimics. Nerve conduction study and needle electromyography are performed infrequently in the current era of genetic diagnosis.*

Keywords: *Pediatric electroencephalogram, Video-electroencephalogram, Electroencephalogram in pediatric intensive care unit, Electromyography.*

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Points to Remember

- ***Epilepsy is a clinical diagnosis and EEG is not a confirmatory test.***
- ***Inter ictal EEG does not distinguish between seizures and seizure mimics.***
- ***Some epileptiform patterns in EEG have low association with seizures in children.***
- ***Video-EEG is the gold standard to confirm psychogenic non-epileptic attacks.***
- ***Genetic testing is the investigation of choice in suspected cases of muscular dystrophy or spinal muscular atrophy; nerve conduction and EMG do not add value in these conditions.***

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NEUROLOGY

GENETIC TESTING IN NEUROLOGICAL DISORDERS - RADIOGENOMICS

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Abstract: *"Radiogenomics" is a new emerging field which correlate imaging features with genotype of disease. It has potential to play an important role in medicine, particularly neuro-oncology, metabolic and neurodegenerative disorders. Genetic testing confirms the diagnosis, helps in prognostication, predicts the risk of recurrence. But selecting the right genetic test is of prime concern and is difficult. Radiological finding or radio phenotype is useful in selecting the genetic tests needed. Role of radiogenomics is bidirectional. It predicts genotype on the basis of radiological phenotype and vice versa. So it plays an important role in bridging the gap between phenotype and genotype. It will further help the clinician to go for targeted sequencing of the gene which will be cost effective and time saving. For example the pediatric tumours which are studied on the basis of radiogenomics are medulloblastoma and glioblastoma. New generation genomic sequencing is very useful in sequencing the DNA at faster rate and lower cost. Whole genome sequencing, whole exome sequencing, clinical exome sequencing and target gene panel sequencing are various tests which are available. Radiogenomics is an important tool to indicate the likely genotype and directs towards the right genetic investigation.*

Keywords: *Whole genome sequencing, Whole exome sequencing, Gene panel sequencing, Radio genomics.*

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Points to Remember

- ***"Radiogenomics" is a new emerging field which correlates the imaging characteristics of a disease (radiophenotype), with its (genotype) genetic or molecular features.***
- ***Next generation genetic sequencing is a technological advance which enable sequencing of million base pairs of DNA at a faster rate and lower cost.***
- ***Whole genome sequencing, whole exome sequencing, clinical exome sequencing and target gene panel sequencing are various tests which are available.***
- ***Knowledge about the various features of these tests is essential to decide the specific test needed.***
- ***Good clinical phenotyping remains the corner stone of deciding the appropriate genetic test and increasing likelihood of a positive yield. But radiophenotype helps bridging the gap between clinical phenotype and genotype, by helping to select the type of genetic test is needed.***

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DRUG PROFILE

OXYGEN AS A PRESCRIPTION

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Abstract: *Oxygen is one of the most common life saving drugs widely used all over the world. It is often needed in many of the acute respiratory emergencies such as pneumonia and asthma where there is a risk of hypoxia. Long term oxygen therapy may be indicated in chronic respiratory conditions such as bronchopulmonary dysplasia (BPD), cystic fibrosis (CF), sleep disordered breathing, interstitial lung disease and pulmonary hypertension. Since medical grade oxygen is classified as a drug with specific biochemical and physiologic actions, with a distinct range of effective doses and well-defined adverse effects at high doses, oxygen needs to be prescribed like any other medication with specifications regarding dose, duration and method of delivery.*

Keywords: *Oxygen, Prescription, Delivery devices.*

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Points to Remember

- ***Oxygen must be considered a medication that warrants a documented prescription before administration, except in emergency situations where written prescription is not mandatory to initiate the therapy***
- ***The prescription should include indication, target saturation range, mode of delivery and flow rate.***
- ***Choice of oxygen delivery device is based on clinical decision.***

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GENERAL ARTICLES

A CLINICAL APPROACH TO SYNCOPE

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Abstract: *Syncope is a common clinical complaint that a pediatrician encounters in the outpatient clinic or in the emergency room. The causes of syncope include autonomic disturbances, cardiovascular causes and neurological problems. Autonomic syncope is the commonest and is usually benign. Cardiovascular causes can potentially be life threatening and it is important to recognize them and refer these children to an appropriate specialist in a timely fashion. It is possible to identify the cause of syncope in most patients with a detailed history and physical examination. In this chapter, we list the causes of syncope and attempt to provide a clinical approach that will permit accurate triage of patients with syncope by a pediatrician.*

Keywords: *Syncope, Neurocardiogenic syncope, Cardiac arrhythmia, Fainting, Convulsive syncope.*

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Points to Remember

- ***Syncope is an important clinical problem in the pediatric age group attending ED.***
- ***There are three groups of causes, autonomic instability which is usually benign and more common, cardiac cause which are serious but less common and others including neurological causes (e.g. convulsive syncope) which are rare.***
- ***The differentiation is usually possible by a detailed history, physical examination and basic investigation like ECG.***
- ***ECG is an inexpensive investigation that probably has the highest diagnostic yield in the evaluation of syncope.***
- ***CT has the lowest diagnostic yield and can be replaced by a good focused neurological examination.***
- ***Unnecessary investigations can be avoided and diagnostic yield can be increased if the pediatrician meticulously takes the history and performs the clinical examination.***

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ADOLESCENCE

ACADEMIC SUCCESS - STUDENT SUPPORT AND GUIDANCE

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Abstract: *Academic success is paramount in any school/ college program. The faculty spent a lot of time to teach many subjects, but often do not guide the students how to study. Poor scholastic performance of school going children is a problem that affect many parents. The predictor variables for poor scholastic performance were; not studying daily lessons, poor concentration in studies, lower education status of father and unhappy family. Early guidance and support may stop students experiencing a cycle of failure. Key to supporting struggling students is to identify reasons for poor performance. Many students lack basic academic skills and do not know how to learn effectively. The transition from school to professional education may affect students emotionally, socially and academically. Recall of information is essential for successful performance in examinations. Better recall can be achieved by time management of study periods and regular systematic learning. Prepare a revision timetable and set out what topics, subjects you want to cover each day.*

Keywords: *Academic success, Scholastic performance, Student support, Enhancing memory.*

Points to Remember

- ***In addition to teaching individual subjects, every faculty should guide the students on method of study.***
- ***This is implemented by organizing student support and guidance program with specific strategies.***
- ***Faculty should identify reasons for student's failure, and offer specific help.***
- ***Time management by balancing study and leisure time activities.***
- ***Students should be taught about preparing for different type of questions namely multiple choice, short answers and essay.***
- ***Organizing the time, practicing memory enhancing methods, taking balanced diets, controlling the stress, discussing with teachers, combined study and organized revision will help succeed in exam.***

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