

HANDLING EMERGENCY AND CRITICAL CARE

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KMCH Touch

Quarterly News Journal of Kovai Medical Center and Hospital



Message From Executive Director

Handling Emergency and Critical Care



Greetings and Happy New Year!

2019 promises to be an exciting year. The focus of this issue is critical thought in ICU and emergency in multiple specialities. We thought of this as appropriate given the increasing amounts of Dengue and H1N1 cases that are becoming more prevalent and the increasing expectations on ICU care. Statistics show that larger and larger volumes of patients are coming through emergency rooms and patients expect a one stop shop for care 24*7

ECMO is being discussed in multiple ICU forums and may take a larger role in cardiopulmonary resuscitation in years going forward. However, the cost is prohibitive.

We created a set of clinical vignettes and topics that would be interesting.

Finally I put in 2 interesting quotes to think about when there is an emergency and there is inadequate information/confused attenders /inadequate support/staff/equipment, etc

"Do or do not. There is no try."

Yoda

"There are two primary choices in life: to accept conditions as they exist, or accept the responsibility for changing them."

Denis Waitley

Happy New Year to everyone from the KMCH Family

Dr Arun N Palaniswami

Executive Director

Editorial Board

Warm Greetings to all,

It give immense pleasure to be a part of this issue dealing with emergencies in various specialties. Hats off to all colleagues on the firing line in casualty, ICU and Theaters.

As always kindly send feed back to Dr. Krishnan Swaminathan. Email Id: drkrishnanswaminathan@kmchhospitals.com

We genuinely hope you enjoy the edition of KMCH Touch.

Dr. Krishnan Swaminathan MD FRCP (Edin)

Editor & Publisher

Dr. Nalla G Palaniswami
Chairman

Editorial Board

Dr. Arun N Palaniswami - Executive Director
Dr. Krishnan Swaminathan - Consultant Diabetologist & Endocrinologist
R. Narayanan - Senior - General Manager - Marketing

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GAJA Flood Relief Camp



KMCH Medical Team consists of 6 Doctors & Paramedical staff were deputed for Gaja Cyclone Relief Camp on 23 & 24.11.2018. The team had visited to the following areas 1. Vilundhamavadi 2. Fishermen's Colony 3. Thirupoondi 4. Thirumangudi. Total No. of patients screened – 547. Vitals check up done to the public and medicines also distributed for the needy people. In addition to that Bleaching Powder & used banners were distributed. Dr. TAMILISAI Soundararajan, President of Tamilnadu BJP visited our camp venue and appreciated our medical team services.



KMCH Has Restructured EMS and ER service in 2018

1) KMCH has purchased additional 2 cardiac ambulances to handle increasing demand for transfer of critically sick patients



2) KMCH creates EMS control service

- " KMCH has created an EMS nerve center for to control ambulances and in the future should have realtime GPS tracking and monitoring of vitals in transport:



3. EMS helpline

- 24 hour emergency helpline in ER staffed by paramedics

- For all transfers , ER services and transport

- Helpline Number : +91 95665 95665

4) Formal EMT training program

We at KMCH, provide a comprehensive training programme, B.Sc(Accident and Emergency care Technology) - A 4year course afield to Tamilnadu Dr.MGR Medical University

5) India's first Mobile Stroke Unit with on-board CT



6) With continuous Quality improvement and Auditing we have improved our quality metrics

- Average Door to triage time in less then 5 minutes
- STEMI Average Door to cath lab time approx average 30 min (last 3 month average)
- Average stroke to CT time 15-20 min
- In stroke Door to thrombolysis time average currently 25 min
- IN stroke door to MRI time - 30min
- In stroke Average stroke to IR intervention in less then 45 min



Dr. K. Dhilipan
MD (Emergency Medicine),
Consultant in Emergency Medicine



Dr. Tharagaram
MEM.,
Consultant in Emergency Medicine



Dr. Ziaullah
MD.,
Consultant in Emergency Medicine



Dr. Prakash
MEM.,
Consultant in Emergency Medicine

“CARDIAC ARRYTHMIAS IN ER”



Dr. K. Dhilipan
MD (Emergency Medicine),
Consultant in Emergency Medicine

Case -1

- 31yrs old female patient shifted to ER from Cardiology outpatient with
- C/O palpitations on & off since 1month.
- H/o chest palpitation increased x 3 days
- No H/O chest pain
- No H/O syncope attack/giddiness

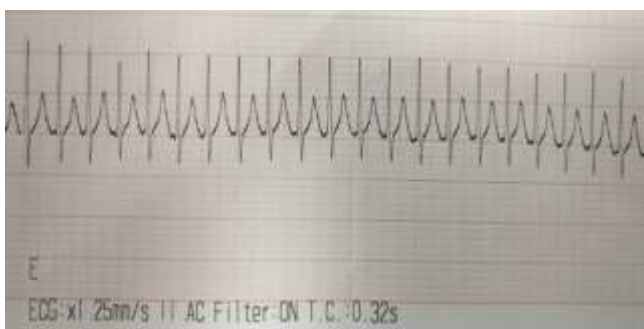
- No H/O breathing difficulty
- Past H/O
- K/c/o Hypothyroidism on regular treatment for 2 years
- Not k/c/o CAD CKD TB BA
- Personal H/O normal bowel /bladder habits no addictions

On Examination

- Airway - patent
- Breathing - spontaneous RR-22/min
- BAE + no added sounds
- SPO2 100% R.A
- Circulation
- BP- 100/60 mmHg temp 98.6 F
- HR-160/min CBG – 105 mg/dl
- all peripheral pulses felt normal volume / character no radio femoral radio radial delay

Systemic Examination

- NO P I C C L E
- CVS – S1 S2 + No murmurs
- R.S- trachea in midline chest raise equal and adequate
- BAE present and equal no added sounds
- P/A- soft , non tender no organomegaly CNS- NFND
- Patient was immediately connected to defibrillator monitor the initial rhythm was



12 Lead ECG



ECG interpretation

- Narrow complex regular tachycardia.
- No obvious discernible P waves.
- HR- 160 b/mt

Stable or Unstable Tachycardia ?

- Hypotension: e.g., systolic blood pressure < 90 mmhg.
- Systemic hypoperfusion
- Altered mentation
- Ischemic chest pain
- Respiratory distress
- Extremely rapid ventricular rate: e.g., rate over 200 beats/min in adult

Differential diagnosis

- AVnRT
- AVRT
- Junctional Tachycardia
- Atrial Flutter
- Atrial Tachycardia
- SVT

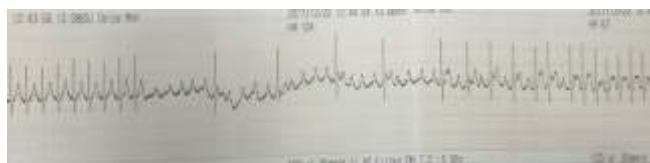
ED Care

- Priority 1 area
- O2 HM 6L/min.
- 18G cannula in left cubital vein, blood sample drawn.
- Adenosine 6mg IV was loaded.
- Procedure explained to the patient.

6mg Adenosine given f/b 20 ml chase fluid

No response to 6mg IV Adenosine

12 mg IV Adenosine was given.



ECG interpretation

- Rhythm slowed transiently
- Atrial Flutter with variable block was observed.

Differential diagnosis

- Atrial flutter
- Ectopic atrial tachycardia
- Junctional tachycardia

Management

Inj. Heparin 5000 IU I.V stat

Inj. Amiodarone 150 mg I.V over 10 min

Inj. Amiodarone 1 mg/ min infusion for 6 hours
0.5mg/min infusion for 18 hours

Investigation

- | | |
|------------------------------------|-----------------------|
| • Tc – 15000 cells/mm ³ | • TSH |
| • Hb – 12.1 g/dl | • T3-2.95 pg/ml |
| • Plt – 3.48 lakhs/mm ³ | • T4- 1.02ng/dl |
| • Crea – 0.7 mg/dl | • TSH3 – 4.970 pIU/ml |
| • Bun – 7 mg/dl | • INR- 0.96 |
| • Sodium – 135mmol /l | |
| • Potassium- 3.7 mmol/l | |
| • Bicarb – 21 mmol/l | |

Echo

- 2decho Good lv function
- Mild to moderate TR with mild to moderate PAH
- No clots in LAA and RAA

Despite 24 hour infusion of AMIODARONE rhythm did not revert to sinus rhythm.

Electric cardio version 100J under adequate sedation done

Sinus rhythm was noted

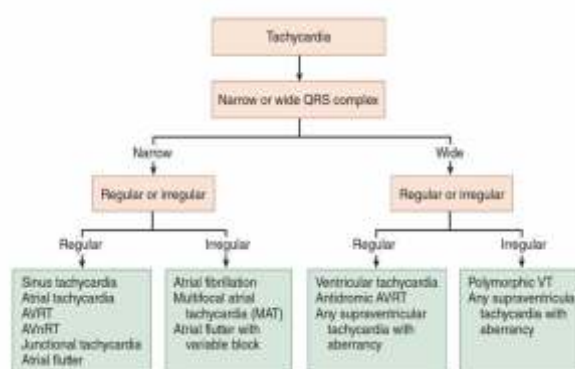
Immediately she developed recurrent atrial tachycardia

Second loading Amiodarone 150 mg I.V given

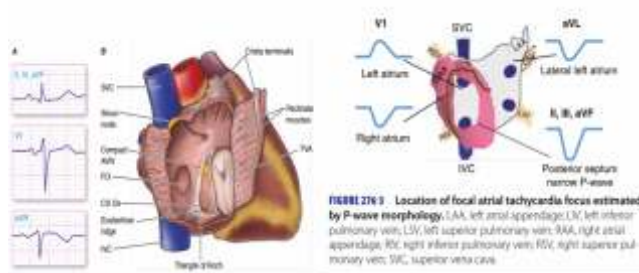
Second DC with 100J done „Sinus rhythm obtained and persisted

Discussion

Tachycardias

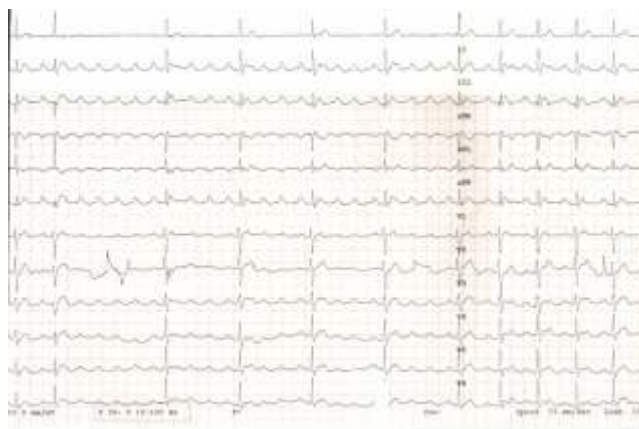


Anatomy



Focal Atrial Tachycardia

- Regular atrial tachycardia with defined p wave
- May be sustained, nonsustained, paroxysmal, or incessant.
- Frequent sites of origin occur along the valve annuli of left or right atrium, pulmonary veins, coronary sinus musculature, superior vena cava



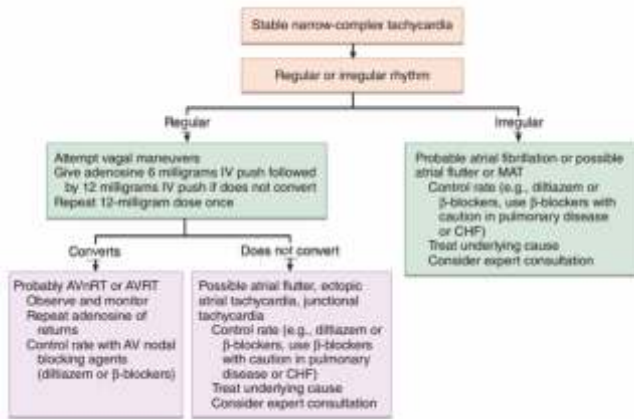
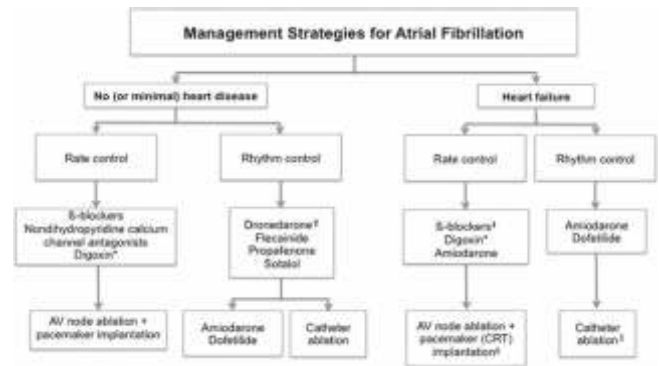


TABLE 18-3 Vagal Maneuvers

Carotid sinus massage	Listen for bruit first; do not massage an artery with a bruit Massage only one side at a time Massage for 20 s or less
Valsalva maneuver	Have patient hold breath and strain against closed glottis while tightening abdominal wall muscles Hold for as long as practical, ideally >20 s Increased vagal tone seen during release phase after breath hold
Diving reflex	More effective in infants than adults Place bag of ice and water on face for 15–30 s

- Best seen in the inferior ECG leads and lead V1.
- Classically around 300 beats/min, varying between 250 and 350 beats/min



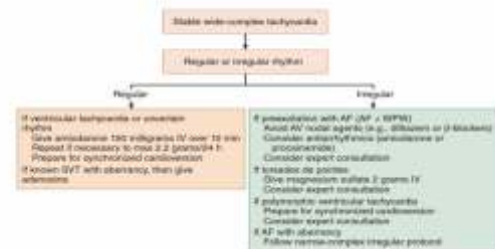
Clinical Circumstance	Treatment	Follow-Up Therapy
Duration <48 h	Chemical or electrical cardioversion to sinus rhythm	If successful conversion, no antithrombotic therapy
Low-risk for embolism ¹	Ventricular rate control <100 beats/min	No antithrombotic therapy Close follow-up
Duration >48 h	Ventricular rate control <100 beats/min	Therapeutic anticoagulation for 3–4 wk
High-risk for embolic complications ²	Ventricular rate control <100 beats/min	Therapeutic anticoagulation for 3–4 wk

Low risk = CHADS₂ score of 0 or a CHA₂DS₂-VASc score of 0 or 1
High risk = CHADS₂ score ≥1 or a CHA₂DS₂-VASc score ≥2

TABLE 18-19 CHADS₂ and CHA₂DS₂-VASc scores

Criteria	CHADS ₂	CHA ₂ DS ₂ -VASc
Congestive heart failure	1	1
Hypertension	1	1
Age ≥75 y	1	2
Diabetes mellitus	1	1
Stroke, TIA, or thromboembolism	2	2
Vascular disease (CAD, PAD)	—	1
Age 65–74 y	—	1
Sex (female)	—	1
Range	0–6	0–9

WIDE COMPLEX TACHYCARDIA



Radio Frequency Ablation

- Electrophysiological study is done prior to the procedure to identify diseased tissue.
- Usually done through femoral vein.
- Uses probe with RF waves or cryotherapy to kill irritable tissues.



General Approach To Narrow Complex Tachycardia

- Atrial flutter most often is a regular rhythm
- Organized atrial contraction
- P waves are present and of a single morphology

Emergency

Case 2

- 49 yrs old female , came to ER with history of chest tightness and sweating
- K/c/o DM on OHA, HTN (past 8yrs) Housewife Father died of CAD Not known allergies
- H/o chest tightness and sweating , lasted for about 25minutes. (4hours before coming to er)
- No nausea/ vomiting / shortness of breath / palpitations / dizziness .
- Chest discomfort not related to exertion.
- No h/o similar episodes before
- On arrival patient was asymptomatic.
- BP 110/70mmhg, HR70/mt
- RR 20/mt SaO2 97% on RA
- RBS – 210mg/dl (Afebrile)

Primary survey

- A - patient
- B - b/l aientry
- C - all peripheral pulses felt
- D - GCS 15/15

Secondary survey

- Neck- no raised JVP
- Chest- b/l nvs
- CVS- S1 S2, no murmurs
- CNS – no focal neurological deficit
- Abd- unremarkable

Imp: ACS

- Cardiac enzymes, CBC , RFT, Serum Electrolytes, LFT & Coag. Profile
- Mng:- Loading dose of Aspirin, Clopidogrel, Atorvastatin, UFH
- ECG



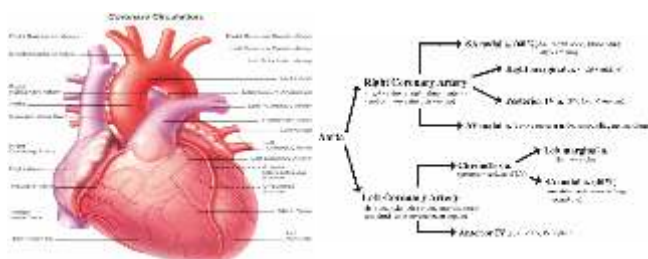
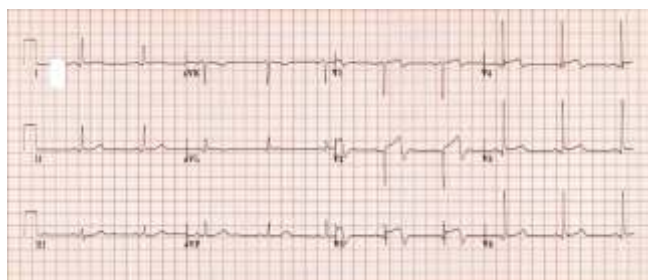
Troponin I was negative

- Admitted to Cardiology ICU as case of Unstable Angina
- Echo - EF 55% no RWMA
- Pt underwent Cor. Angio after 2days showed 70% stenosis proximal LAD. Stenting was done.



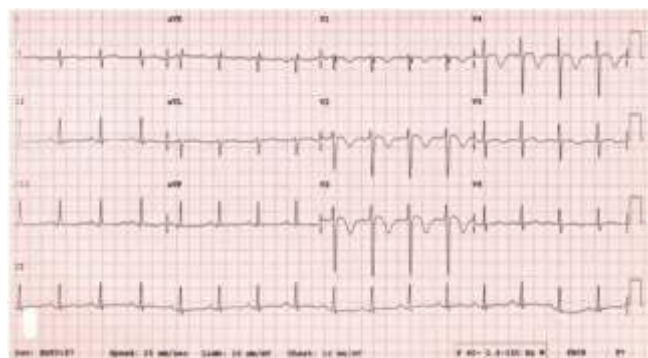
- First described in early 1980`s by Prof WELLEN
- Noticed precordial T wave inversions / biphasic T waves in a subgroup of patients with unstable angina in pain free period.
- >50% proximal LAD stenosis was seen .
- Wellen`s is a pre infarction stage of CAD.
- often progresses to a devastating anterior wall MI.
- Wellen`s syndrome is also referred to as LAD coronary T-wave syndrome
- Criteria
- Biphasic / symmetrical T waves in precordial leads
- h/o ischemic chest pain
- normal or minimally elevated cardiac enzymes
- ECG without Q waves, without significant ST-segment elevation, and with normal precordial R-wave progression
- 2 types of Wellens syndrome
- Symmetrical deeply inverted T waves in precordial leads (75%)
- Biphasic T waves in precordial leads (25%)
- The T waves evolve over time from Type A to Type B pattern



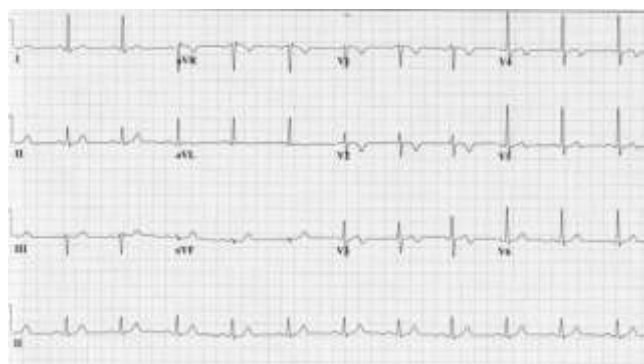


Risk factors

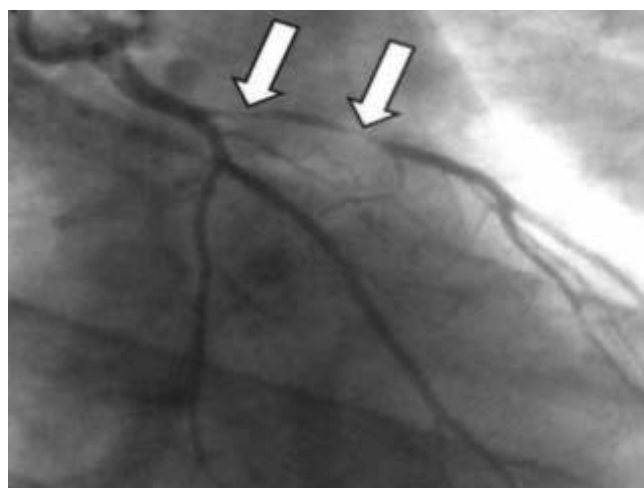
- Smoking history
- Diabetes mellitus
- Hypertension
- Increased age
- Hyperlipidemia
- Strong family history of heart disease
- Occupational stress
- History is consistent with ischemic chest pain
- Elderly, diabetic, female patients more likely to present with atypical presentations.
- Physical examination most of time doesn't provide any indication
- Investigations
- ECG
- Cardiac biomarkers



- Of patients admitted with unstable angina, this ECG pattern is present in 14-18%.
- its natural progression leads to anterior wall MI.



- Evolution to an anterior wall MI is rapid, with a mean time of 8.5 days from the onset of Wellen's syndrome to infarction
- Initial treatment same as ACS
- Admit to Cardiology ICU
- Echo
- Early Coronary Angiography
- NO STRESS TESTING
- Approximately 75% of patients with Wellen's syndrome who receive only medical management and do not undergo revascularization (either through CABG or through angioplasty) will go on to develop extensive anterior wall MI within days.
- Anterior wall MI carries substantial morbidity and mortality: it will result in left ventricular dysfunction and possibly even death.



- To recognize Wellen's syndrome T-wave changes on ECG
- DO NOT order a stress test.
- Never underestimate the seriousness of the lesion in a pain-free patient.
- Admit patients with these characteristic ECG changes.

Extra Corporeal Membrane Oxygenation in Drug Over Dose - Case Reports & Review

Dr. Devender Singh, Dr. Shegu G (Dept. of Cardiothoracic Surgery) **Dr. Vijayanand** (Dept. of Internal Medicine)
Dr. Selvaraj (Dept. of Critical Care) **Mr. Gnanaraj, Mrs. Akhila, Ms. Jayasri** (Dept. of Perfusion Technology)



*Dr. Devender Singh
MS., MCh.,
Consultant Cardio Thoracic Surgeon*



*Dr. Shegu .G
MS(Gen Sur.), MCh(Cardio Vascular),
Jr. Consultant Cardio Thoracic Surgeon*



*Dr. Vijay anand
MD.,
Consultant in General Medicine*



*Dr. Selvarajan
MD., FICCM
Head Dept. of Anaesthesiology
& Critical Care*

Mechanical circulatory support in the form of extracorporeal membrane oxygenation (ECMO) is an invaluable tool in the care of patients with severe refractory cardiac failure, pulmonary failure, or both. ECMO, first introduced clinically in 1972, has been applied as a means of cardiopulmonary support for patients with potentially reversible cardiac failure, respiratory failure, or both in whom conventional medical strategies have been exhausted. We report our experience of 2 cases of ECMO in drug over dose presenting with refractory cardiac failure.

Case I : A 16-year-old female was admitted to the emergency department with severe hypotension and vomiting, 8 h following ingestion of 20 tablets of amlodipine. She was conscious, oriented with blood pressure (BP) of 90/50 mmHg; heart rate (HR) of 55/min; respiratory rate (RR) of 30/min; oxygen saturation (SpO₂) of 92% and warm peripheries. Gut decontamination with activated charcoal and resuscitation with boluses of intravenous (IV) crystalloids, calcium gluconate, and norepinephrine infusion was done.

On arrival to Intensive Care Unit (ICU), her BP was 80/40 mmHg. Arterial blood gas (ABG) analysis revealed metabolic acidosis with pH of 7.25 and serum lactate of 5.2 mmol/dL. Her echocardiography showed normal left ventricular (LV) function. She was electively intubated and ventilated and resuscitated with a total volume of 5.94 L of IV crystalloids. She was also initiated on standard doses of IV 10% calcium gluconate; IV 20% intralipid IV insulin, and IV glucagon. Despite 9 h of aggressive resuscitation, her metabolic acidosis and hemodynamics worsened requiring high doses of triple vasopressors (noradrenaline, adrenaline, and vasopressin). At this point of time, a decision to initiate peripheral VA ECMO was made. A 17-French cannula was inserted into the left femoral artery and a 21-French cannula into the right femoral vein. An additional 7-French cannula was placed in the left femoral artery to facilitate distal perfusion. VA ECMO was initiated at a flow of 3.7 L/min, and within 2 h, her vasopressor requirement decreased significantly. Over the next 6 h, her acidosis settled and lactate levels decreased. By the 2nd day, she had significant improvement in her hemodynamics. By the 4th day, she was decannulated. She moved out of ICU on 7th day.

Case II : A 26-year-old Male was admitted to the ICU about 24 h after having ingested 30 tablets each of amlodipine 5 mg. He was resuscitated in another hospital before the transfer. On arrival to the ICU, he was on high dose of multiple vasopressors (noradrenaline, adrenaline, dopamine, and vasopressin). HR was 78/min, in sinus rhythm; BP was 70/40 mmHg; SpO₂ 90% on 40% FiO₂; and central venous pressure was 24 mmHg with cold peripheries. Echocardiogram showed normal LV function. Baseline ABG showed metabolic acidosis with a pH of 7.16 and lactate level of 4.59 mmol/dL. He was resuscitated with standard doses of IV calcium gluconate, intralipid insulin, glucagon, and sodium bicarbonate. Despite 14 h of aggressive resuscitation, his vasopressor requirements increased and his shock worsened leading to initiation of a peripheral VA ECMO. The cannulation technique was similar to that used for case 1 and the ECMO flow was set at 4 L/min. Over the next 24 h, his vasopressor requirements reduced significantly and he was completely weaned off vasopressor support. Urine output and lactate levels

improved gradually. By the 3rd day, the calcium, insulin, and glucagon infusions were sequentially stopped. ECMO was decannulated on the 4th day, and he was extubated on the 5th day. However, on the 7th day, he developed swelling and tenderness in the left lower limb over the arterial cannulation site, requiring fasciotomy for impending compartment syndrome. He responded well to treatment and was moved out of ICU on the 10th day.

Discussion : Calcium channel blocker overdose can cause serious mortality and morbidity. Half-life of amlodipine 34 to 50 hours. The overdose can cause profound refractory hypotension, bradyarrhythmias, and shock. The combination of these drugs may blunt the sympathetic and vasoconstrictive responses and worsen toxicity. These drugs are not dialyzable because they are highly protein bound with large volume of distribution. The medical management of CCB drug overdose includes general and specific measures. General measures include stomach wash via nasogastric tube with activated charcoal.

Special measures include administration of vasoconstrictors, intravenous calcium gluconate, and Inj. glucagon that acts by increasing intracellular cyclic adenosine monophosphate (cAMP). Hyperinsulinemia-euglycemia therapy involves infusion of high dose of insulin along with 25% dextrose to maintain euglycemia. Insulin has positive inotropic action, increases plasma levels of ionized calcium, and improves the myocardial use of carbohydrates instead of free fatty acids.

The principle of extracorporeal support in cardiovascular medication overdose is to support the hemodynamics and vital organ perfusion, until the medications have been eliminated from the system. The ECMO system used in this case series was MEDOS DELTA STREAM which include Rotaflow centrifugal pump and heparin coated polyvinyl tubing, and membrane oxygenator with an integrated heat exchange system. All patients were heparinized just before insertion of vascular cannula and heparin infusion was continued to maintain activated clotting time of 160–180 s. ECMO flow was initiated at 3.5 – 4 L to maintain adequate mean arterial pressure. All patients were mechanically ventilated and other organ supports were provided as indicated.

Once the hemodynamics improved, ECMO flow was gradually reduced and hemodynamic stability was assessed. If patient remained hemodynamically stable, ECMO was weaned off. The average admission to ECMO initiation time in our hospital is 18 hours. Like any other invasive devices, ECMO too comes with its set of complications. Limb ischemia is a well-documented complication of ECMO support. The other major reported complication is bleeding.

Conclusion : When medical therapy is ineffective for cardiotoxic drug overdose, ECMO may be a lifesaving intervention. Early initiation of ECMO support before organ failure or cardiac arrest sets in should be contemplated and may ensure the better overall outcome.

Event Photos



Anaesthesia Conference



Anatomy Conference

Altered Sensorium In A Young Lady - Ovary Is The Cause!

Nishanth S MD (FNB Critical Care), **Arunkumar V** MD,IDCCM, **Karthik R** MD,DA,IDCCM,EDIC, **Sriramamoorthy M** DNB,IDCCM, **Saraswathy T** DA,EDIC, **Arul Selvan V** MD,DM,MRCP (UK),FRCP (London),FRCP (Edin) & **Selvarajan N** MD,FICCM
Department of Critical Care Medicine, Department of Neurology



Dr. Nishanth .S
MD (Gen.Med).,
FNB Post Graduate



Dr. Arunkumar .V
MD(Anaes).,IDCCM.,
Jr. Consultant Intensivist



Dr. Karthik .R
DA.,MD.,IDCCM.,EDIC.,
Jr. Consultant Intensivist



Dr. Sriramamoorthy .M
DNB., IDCCM.,
Jr. Consultant Intensivist



Dr. Saraswathy .T
DA.,EDIC.,
Jr. Consultant Intensivist



Dr. Arul Selvan
MD.,DM.,MRCP(UK).,FRCP(Lon).,FRCP(Edin).,
Consultant Neurologist



Dr. Selvarajan
MD., FICCM
Head Dept. of Anaesthesiology
& Critical Care

Abstract: Anti NMDAR encephalitis occurs in children and young adults. This is a report about a young female patient who presented with altered sensorium. Initially thought to be a simple CNS infection, later turned out to be NMDAR encephalitis. This diagnosis was achieved by exclusion of common diseases sequentially. Retrospectively, she had classical symptoms of this rare disease entity. Though this is a rare case, this should be borne in mind as one of the differentials, if a patient with altered sensorium doesn't fit into more common diagnosis.

Day	Date	Symptoms	Treatment
0	5th May	Visited black thunder water theme park	---
1	6th May	Fatigue & body pain	Analgesics
3	8th May	Headache occipital	Analgesics
8	13th May	Consulted a local doctor for headache	injections?
13	18th May	High grade fever, headache- admitted in a local hospital	Cefaprazone+subactam, amikacin, analgesics & antipyretics
18	23rd May	Fever, headache settled. Discharged at request	Went home and was at home
19	24th May	Symptomatic with headache at home	at home
20	25th May	Altered behavior ?hallucinations, fever, headache & vomiting	At home
21	26th May	Fever, headache, neck rigidity, bradycardia. Oriented to time, place & person	Reached and got admitted in KMCH

Case report: 25 years housewife from Udumalaipettai, mother of two kids with no previous comorbidities and no addictions was admitted with history of fever and altered behavior. She was apparently normal till 5th of May 2018 when she had a trip to Black thunder (water theme park) in Mettupalayam. The timeline of symptoms is presented as a table.

With this timeline of symptoms, probable diagnosis of meningoencephalitis was made. Started on ceftriaxone, dexamethasone and antipyretics. Non-contrast CT brain was normal.

Routine investigations (including TSH) were essentially normal. Admitted in the ward. White cell count was 10400/dl. CSF analysis revealed 300 cells with 98% lymphocytes, proteins of 70mg/dl with a glucose of 82mg/dl (corresponding RBS was 143mg/dl). TB PCR and HSV PCR were sent and acyclovir was then added. MRI showed sulcal hyperintensity – not pointing to any specific etiology. She remained asymptomatic for about 24 hours in hospital. On second night of hospital stay, she developed altered behavior and became abusive.

In view of altered sensorium and abusive nature, she was shifted from the ward to neuro ICU for close monitoring. Antibiotics and antivirals were continued. Sedatives were used to calm her. From next day she had intermittent tachycardia (around 160 bpm), with sweating and high blood pressure. She started having vacant look and was less responsive. She started developing abnormal postures. As her GCS worsened she was shifted to main ICU on 5th day of hospitalization (26th day of onset of symptoms) and required intubation and mechanical ventilation. She developed abnormal lip smacking movements. This continued for 2 more days. TB PCR, HSV PCR and CSF ADA were not contributing to the diagnosis. Interrogated her husband in vain for any missed history. She was started on steroids (1 g of methylprednisolone for 5 days), empirical ATT and antiepileptics. Repeat MRI did not add on to the previous findings. Repeat LP, showed 200 leucocytes (lymphocytic predominance) with proteins – 28mg/dl, sugars – 78 vs 210mg/dl. India ink examination was negative. USG abdomen to rule out any ovarian tumor considering NMDA receptor encephalitis turned out to be negative. Autoimmune panel was asked from CSF. Patient continued to have fluctuating heart rates, abnormal posturing and poor GCS (E2VtM2). By this time, around 2 weeks of hospital stay was over. She continued to be in the same state. Fortunately she had not developed any hospital acquired infection.

After a week, when we got the reports, as we guessed, she was positive for anti-NMDA receptor antibodies. Ultrasound did not pick up any teratoma. We did a CT abdomen, which showed a right ovarian teratoma. So, a final diagnosis of anti NMDA receptor encephalitis was made. Planned for oophorectomy and involved oncologist and gynaecologist. But, her husband wanted to take her to CMC, Vellore and we discharged her AMA. She had an oophorectomy done there. On follow up, her husband said that her sensorium recovered over a few weeks after surgery and she was responding to simple commands. She was on tracheostomy and currently under rehabilitation for weakness, possibly critical illness neuropathy. All other symptoms settled.

Discussion: A young lady with head ache, fever for about two weeks, presenting with intermittent altered sensorium and bradycardia. All these pointed towards probable meningoencephalitis with raised ICP. Other possible differentials considered when she failed to respond and worsened were Hashimotos encephalitis (young female with fluctuating altered sensorium), multiple sclerosis, ADEM and paraneoplastic CNS manifestations. On narrowing down the differentials, MRI almost ruled out the possibilities of intracranial space occupying lesion, multiple sclerosis and Acute Demyelinating Encephalomyelitis. Two odd things stood out in this case. Bradycardia and “fluctuating” altered sensorium made us think of a functional cause also.

Fluctuating heart rate and sweating – autonomic instability! Vacant looks and abnormal posturing – catatonia! Lip smacking movements – dyskinesias? Yes. Retrospectively when we analysed, these were the clinical features of the diagnosis we achieved.

As relatives became apprehensive and we had no diagnosis for a young lady with downhill course, we made our mind to treat all differentials (antibiotics, antivirals, ATT, steroids). The possibility of autoimmune encephalitis remained strong as she was not fitting into any diagnosis and so we decided to wait and watch the results of autoimmune work-up.

In a week time, our guess turned out to be right proving it to be a case of anti NMDA-R encephalitis. As expected, she had an ovarian teratoma. **OVARY IS THE CAUSE OF ALTERED SENSORIUM IN THIS YOUNG LADY!**

ANTI NMDA-R ENCEPHALITIS: Affects children and young adults. Relapses in 15 to 20%. It is frequently misdiagnosed as meningitis and psychosis. Usually associated with ovarian teratoma though 35% are idiopathic. It is characterized by multistage progression featured by psychosis – bizarre behavior/ hallucinations/delusions, memory deficits, seizures, language dysfunction, state of unresponsiveness – catatonia, involuntary movements – orofacial dystonias/rigidity, autonomic instability. Treatment options are steroids, IVIg, tumor excision (earlier, the better) and second line immunosuppressant. 75% of the patients do recover or have mild sequelae.

Conclusion: Such uncommon diseases should be kept in mind while dealing with CNS infections. They should not be labelled as functional without making efforts to rule out all other possibilities. Sometimes ultrasound may not pick up such lesions and CT scan should be done whenever there is a strong suspicion. We did go methodically and reached the diagnosis finally though a bit late.

Prone Ventilation In ARDS

Dr. N. Selvarajan M.D.(Anaes. – AIIMS), FICCM **Dr. T. Gopinathan** MD, IDCCM, EDIC

Dr. S. Yuvaraj MD, DA, IDCCM, EDIC **Dr. K.V.K. Balaji** DNB (Anaes.), (IDCCM) Dept. of Critical Care Medicine, KMCH, Coimbatore



*Dr. Selvarajan
MD., FICCM
Head Dept. of Anaesthesiology
& Critical Care*



*Dr. T. Gopinathan
MD., IDCCM.,
Consultant Intensivist*



*Dr. S. Yuvaraj
MD., DA., IDCCM., EDIC.,
Consultant Intensivist*



*Dr. K.V.K. Balaji
DNB.,
Registrar in ICU*

Introduction: ARDS is a challenge to intensivist & anaesthesiologist, more so with a lot of H1N1 patients presenting with severe ARDS (Acute Respiratory Distress Syndrome). In ARDS with $\text{PaO}_2/\text{FiO}_2$ ratio < 200 (poor oxygenation), patchy atelectasis/ fluid filled lung with the small normal lung receiving most ventilation producing high alveolar pressures subjecting the lung to barotrauma, volutrauma and biotrauma. Thus IPPV (Intermittent Positive Pressure Ventilation), the primary mode of support in ARDS till now may itself contribute to lung injury. In KMCH during this season with viral pneumoniae esp. Swine flu, quite a few of them required ventilatory support and atleast a third needed prone ventilation due to severe ARDS refractory to conventional ventilation with high PEEP. Hence we thought it will be useful to write an article on “prone ventilation” explaining how it works, indications and complications.

Newer Ventilatory Strategies For ARDS Ventilation (A Few)

- IRV (inverse ratio ventilation)
- Permissive hypercapnea – “baby lung concept”
- Prone ventilation
- APRV (airway pressure release ventilation)
- Tracheal Gas Insufflation – TGI
- NO (nitric oxide)
- HFJV (High frequency jet ventilation)
- ECMO & IVOX (extra corporeal membrane oxygenator & intra venous oxygenator)

Prone Ventilation: One of the established modes of ventilation in ARDS in patients with poor oxygenation in spite of high inspired oxygen and high PEEP. This is practiced in most of the ICUs all over the world. It can be practiced in any hospital where ventilation is possible. This is not a ventilatory mode but

ventilation in prone position instead of supine position to recruit alveoli and improve oxygenation. The results are dramatic in most of the cases. It is an inexpensive strategy where the intensivist does not require any special equipment. All you need is 4 persons to turn prone and a team that is familiar in handling prone patients.

History Of Prone Ventilation:

- 1922 – Beams & Christie reported vital capacity is less in supine than in upright
- 1976 – Piehl & Brown published benefits of prone ventilation; but went unnoticed
- 1987 – Albert RK et al. first studied effects of prone ventilation mechanistically
- 1988 – Langer repeated clinical observations

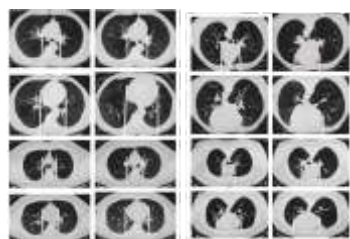


Effect On Prone Position On Oxygenation: Prone ventilation improves oxygenation. The degree of improvement varies but sufficient enough to allow a decrease in FiO_2 , PEEP or both. This improvement persists even after turning the patient to supine position. Patients with definitive increase in PaO_2 are called “Responders” and they contribute 50 – 75% of the patients on prone ventilation and the rest are non-responders, who do not benefit from prone. Rarely PaO_2 may fall.

How prone improves oxygenation??

- Improved Ventilation-perfusion (V/Q) match
- Preferential perfusion to the dorsal lung irrespective of position
- Prone eliminates compression of heart by lungs
- Gravitational gradient in plateau pressure approaches zero in prone position
- Better drainage of secretions in prone
- Increase in FRC in prone
- Abd.pressure & Diaphragmatic movement

Preferential perfusion: Regional perfusion studies with radio labeled microspheres showed preferential perfusion of dorsal lung regions irrespective of supine or prone. Improvement from reduction in shunt & better V/Q, multiple inert gas elimination are all the factors which are responsible for the benefits of prone ventilation. Though this is against gravitational theory, many studies have confirmed this (Wiener CM et al. J Appl Physiol 1990).



Lung compression by the heart: Lung compression by heart is relieved by proning. The weight of the heart compresses part of the dorsal lung in supine & this is eliminated in prone

as the heart rests on the sternum. This allows more alveolar recruitment & improvement in oxygenation.

Gradient in pleural pressure: In ARDS dorsal lung regions are exposed to a compressive force from positive pleural pressure that will cause airspace closure in supine especially at end exhalation. Turning prone reduces the positive pressure in dorsal areas & reduces pleural pressure gradient resulting in requirement of less airspace pressure to open the airway and this results in more uniform lung inflation.

Drainage of secretions: In prone, the airways angle downwards, thereby facilitating the secretions from smaller airways drain into larger airways. This allows airways to open at a lower intra-airway pressure. Drainage of copious secretions on turning prone has been noted in many patients.

Increase in FRC: Prone position increases FRC. This is reported as early as 1961 by Moreno & Lyons. Although prone could improve FRC improving oxygenation, it is clear that improve can & do occur even without substantial changes in FRC

Diaphragmatic movement: In supine patients the nondependent portion of diaphragm underwent greater excursion than dependent portion during mechanical ventilation (Froese & Bryan). In supine ventilated patients ventral & dorsal portions of diaphragm move symmetrically but dorsal portion moves far more in prone, implying factors other than abdominal pressure (Krayner et al.).

Indication:

- Severe ARDS
- When high PEEP (> 15 cm H₂O) + high FIO₂ (> 0.6) to achieve PaO₂ of > 60 mm Hg
- To prevent O₂ toxicity
- To prevent barotrauma

Contraindications:

- Unstable haemodynamics & impending cardiac arrest
- Perforating eye injuries if pressure on eye ball cannot be prevented in prone
- Multiple fracture ribs with flail chest
- External fixators or other devices over pelvis or femur preventing prone positioning
- Pressure sores over forehead, chest, breast, etc.

How to Institute Prone Ventilation

Confirm ARDS & Poor oxygen:

- ABG – baseline
- X – ray chest
- PaO₂ / FIO₂ ratio
- Compliance

Before turning prone:

- Sedate and paralyse, settle on appropriate ventilator mode
- Baseline ABG in supine
- Secure ET tube well
- ET suction
- Make sure of stable haemodynamics
- Protect eyes – ointment, close eyelids & padding
- Protect pressure areas
- Change ECG leads to back or sides
- Disconnect catheters, I.V. lines, feeding tubes, etc./ or change to suit prone position
- Check SpO₂

How to turn prone:

- Have 3 to 4 pillows – one each under legs, hips, chest & face
- Have 4 – 5 persons to turn
- Decide & tell all members which side to turn
- Move the pt. to the edge of the bed
- Make sure iv lines ,tubings, etc are OK to turn prone
- Get the pt to lat first & then turn prone
- Check SpO₂/ ECG
- Lift the pt and insert pillows
- Pt in prone position
- Pt in prone position

After turning prone:

- Make sure SpO₂ & vitals are OK
- Ensure the abdomen is free from compression
- Take care of pressure areas – scrotum, breasts, forehead & eyes
- Keep arms by the side of the body – anatomical position
- Turn the head to one side with access to ETT
- Confirm the ETT position & secure it well
- ET suction if required
- Reconnect tubes, iv lines, catheters ,etc.
- ABG in 2 hours

Responders & Non - responders: According to Langer et al., responders are those who show PaO₂ increase of > 10mm Hg after 30 min of prone. Non- responders include those patients whose PaO₂ decreases or does not change. This definition has now broadened. Patients with increase in PaO₂/FIO₂ ratio of > 20 or 20% within 2 hrs of prone are responders.

How long to leave in prone: Frequency & duration of prone positioning varies and is usually 8 – 18 hrs (2 – 30 hrs). Some leave in prone for as long as possible. Turning supine for atleast 4 hrs/day allows inspection, oral care & relief of pressure. It is advised to turn back to supine if he is a non- responder.

Non-responders - why & what to do: Ventral airspace collapse in ARDS may be a reason for failure to improve or worsening of oxygenation in prone. No recruitable lung in non-responders may be another reason for failure to improve in prone. Patients who fail to respond to the initial attempt may improve on subsequent attempts. Hence a repetitive “daily prone test ” for 2 hrs is recommended by Jolliet et al.

Intolerance to prone ventilation: Patients who don't tolerate prone position should be turned immediately to supine. The team should have a rapid response plan to reposition the patient supine for CPR, if there is a cardiac arrest. Chattle et al described intolerance as 5% decrease in SpO₂ or a decrease in mean art BP of 25 mm Hg or presence of cardiac arrhythmias.

Disadvantages of prone:

- Physical examination is difficult
- Tracheal suctioning & nursing care difficult
- Management of emergencies like cardiopulmonary arrest, accidental extubation are difficult
- Pressure on face, eyeballs, breasts, etc.
- Difficult in patients with fracture ribs, unfixed long bone fractures & those with external fixators

Complications:

- Critical events such as cardiac arrests, accidental extubation, etc.
- Clinical problems – cutaneous problems, Pressure sores, corneal ulcers
- Reversible dependent edema on the face (forehead, eyelids, conjunctiva, lips & tongue) & ant chest wall, contractures
- Aspiration of enteral feeds on turning supine

How to prevent complications:

- Secure ETT before turning
- Disconnect/ secure well iv lines, tubes & catheters
- Take measures to preserve skin integrity – avoid pressure on eyes, reposition head using pads to cushion bony prominences
- Changing the position 2nd hourly & using pressure reduction surfaces
- 10 degree head end elevation to reduce facial edema
- Avoid unphysiological movements of extremities during change of position

Conclusion: Considerable clinical experience confirms oxygenation improves in ARDS patients by employing prone ventilation. Improvement occurs due to reduction in shunt, relief of lung compression by the heart, better drainage of secretions & better V/Q match. Prone ventilation has the potential of reducing oxygen toxicity & barotraumas. Prone ventilation can be practiced in any hospital where facilities for ventilation is available.

Cases of Poisoning : High Degree of Suspicion in Unresponsive Patients is an Undeniable Tool To Unravel Diagnostic Dilemmas

Dr. Varun Ramamurthy, Consultant Intensivist KMCH Sullur **Dr. Vikraman. G**, Consultant Nephrologist
Dr. Vadivelu, Consultant Neurologist **Dr. Selvarathinam**, Surgical Gastroenterologist



Dr. Varun Ramamurthy
Consultant in General Medicine



Dr. Vikraman .G
MD(Gen.Med), DM(Nephro),
Consultant Nephrologist



Dr. Vadivelu
MD(Gen.Med), DM(Nephro),
Consultant Nephrologist



Dr. Selvarathinam
Consultant in Surgical Gastroenterology

The most challenging case faced by any critical care team involves treating a patient brought in unstable without any history of precipitating events, no signs of external injury and a very panicky group of attenders. We try to present the cases brought to sulur in similar scenarios and the clinical acumen of our group of consultants that saved the day.

Case 1 : An 55 yr old gentleman Mr V brought in with pink frothy sputum, desaturation, forehead sweating, altered mental status and coarse crepitations over the whole of chest. His blood pressures were very high and he was stabilised with advanced airway and invasive lines. A provisional diagnosis of ACS with pulmonary edema was made and cardiologist was summoned . He too saw good LV function with possibly some regional wall movement abnormality on echo cardiogram. Patient oxygenation continued to improve and his heart rate suddenly stabilised to low normal values [<60] Though ECG was not indicative an ongoing inferior wall MI was suspected and plan to introduce temporary pacing if BP became unstable was taken.

But when the staffs noticed pin point pupil , we wanted to rule out any CNS cause and also kept other possibilities open. When Nephrologist Dr Vikraman suggested we try an atropine infusion, it was initiated rather reluctantly as no smell of OPC was encountered during resuscitation. But the chest signs cleared rapidly and on further probing attenders accepted that he had hinted about life ending decisions over the past few days. Toxicolgy profile clinched the diagnosis and he had prolonged icu care with intermediate syndrome that warranted an tracheal cannulation for weaning.

Case 2 : A 25 year old gentleman was brought from nearby arts college from the hostel unresponsive for unknown time. He had a fever history and past history of seizures. He was admitted under neurologist and a provisional diagnosis of meningitis induced seizure with or without Hypoxemic encephalopathy was entertained. MRI scan and lumbar puncture were inconclusive and repeated denial by attenders for any poisoning, claiming he is very vocal against anyone contemplating the idea. But they also revealed one of his close friend had passed one year back in a road trauma. Based on this a toxicology screening was sent which showed altered cholinesterase level and hence he was treated for OPC poisoning. He recovered slowly and he admitted to intake of ant killer powder, which explained the absence of typical cholinergic symptoms.

Case 3 : An 75 year elderly gentleman admitted with unresponsiveness and history of DM , Hypertension and alcohol abuse. He was evaluated for hypoglycemia and CVA. When his chest started deteriorating he was ventilated and he showed fall in Hb and worsening renal parameters. CT brain was normal. His lab investigations was relatively normal except for anemia & heaemolysis . Hematologist consult could not find source. Possibility of microangiopathies, though uncommon in this age group ,were evaluated . Patient gradually improved with supportive care. After weaning him with a tracheostomy, he then admitted to taking floor cleaners.

Case 4 : A 60 yr old male presented as alleged poisoning by OPC after the patient proclaimed he had stomach cancer recently diagnosed to the family. Patient admitted to ICU and was in critical state. Patients family searched but no records and possible visits to nearby hospitals were found. Evaluation of stomach cancer was held off till patient was stabilized. Meanwhile patient regained consciousness and wrote that he had self diagnosed using GOOGLE browser. He recovered fully and was given a clean chit by the gastroenterologist.

Conclusion : Poisoning thus presents in myriad ways. Attenders providing us a clue goes a long way in diagnosing it. But even vehement denial by them does not rule out and unwavering high index of suspicion is the only reliable weapon in this baffling battle against unknown diagnosis.

Non - Invasive Respiratory Support Therapy in Children - Giving Breaths

Pediatric Intensive Care Unit Team: **Dr. Mullai Baalaaji A R, Dr. Ashok Kumar S, Dr. Vigneshwaran TP**



Dr. Mullai Baalaaji
MD(Paed), DNB(Paed), IDPCCM, DM.,
Consultant Paediatric Intensivist



Dr. Ashok Kumar .S
MD, IFPCCM.,
Consultant Paediatric Intensivist



Dr. Vigneshwaran .T.P
DNB(Paed), IDPCCM.,
Registrar in PICU

Non-invasive Respiratory Support Therapy (NiRST) is an alternative to intubation and ventilation for acute and chronic respiratory disorders in infants and children. The treatment modality encompasses use of Continuous Positive Airway Pressure (CPAP) and Non-invasive ventilation (NIV). Recently, High Flow Nasal Cannula (HFNC) is added to NiRST armamentarium and is being increasingly employed especially in young infants.

Knowing the Terminologies: CPAP refers to the use of continuous distending pressure throughout the respiratory cycle in a spontaneously breathing child and can be delivered either through ventilator circuit or stand-alone CPAP devices. NIV entails use of two levels of pressures – Inspiratory Positive Airway Pressure (IPAP) and Expiratory Positive Airway Pressure (EPAP) and can be delivered through conventional ventilator or BiPAP device. HFNC involves use of heated and humidified air-Oxygen mixture at high flows typically around 1-2 L/kg/min through specially designed cannulas that provide laminar flow patterns.

Experience at PICU, KMCH: NiRST is being used as the initial modality of respiratory support in those with mild to moderate defects in oxygenation and /or ventilation . A retrospective audit was performed to study the characteristics of NiRST use in the PICU. A total of 48 children were studied, Ventilator NIV and HFNC were the two common modalities employed. Severe Dengue was the commonest underlying etiology, followed by Community Acquired Pneumonia and Bronchiolitis. Among the 48 children studied, improvement and successful outcome was noted in 44 children (91.7%), in whom invasive ventilation could be averted. No major complications/side effects of NiRST were noted. Thus, non-invasive support was found as a useful modality for acute respiratory failure in our PICU.

Indications for NiRST in children: The predominant evidence for the utility of NiRST to manage acute and chronic respiratory failure was mainly from neonates and adults, but of late there is growing evidence of its use in children as well. The common indications are given as below:

- | | |
|--|----------------------------|
| 1. Bronchiolitis | 5. Post extubation |
| 2. Status asthmaticus | 6. Neuromuscular disorders |
| 3. Mild Acute Respiratory Distress Syndrome (ARDS) | 7. Cystic fibrosis |
| 4. Cardiac failure | 8. Obstructive sleep apnea |

The modality is especially recommended in immunocompromised children, in whom invasive ventilation could be potentially avoided.

Contraindications: Altered Sensorium, unstable airway, significant hemodynamic compromise are some of the contraindications for use of NiRST. Also, severe ARDS patients are better managed with invasive mechanical ventilation.

Challenges in children: The main challenges in using NiRST in children are the interfaces and delivery devices. The commonly used interfaces in children include Nasal cannula, nasal mask, oronasal mask, total face mask and helmets. Leaks pose a major problem while choosing the appropriate interface. The other common challenge involves tolerability of the interface, since the high flows make it uncomfortable for children. It may be necessary to administer some anxiolytic medications during the initiation of NiRST. The choice of a particular mode and interface depends entirely on the local availability and familiarity of the device to the treating physicians and supporting staff.

Safety and complications: Complications associated with NiRST include pressure ulcerations, gastric distension, aspiration, air leaks. Pressure ulcerations can be minimised by careful evaluation of the skin over mask application area at regular intervals. When necessary, nasogastric tube could be inserted to decompress gastric contents while a child is on NIV.

A major determinant of successful NiRST implementation involves careful monitoring of the respiratory status of the child to identify those who tolerate the modality poorly or those who fail the trial of NiRST. Appropriate identification of non-responders mandates escalation of the support to invasive mechanical ventilation.

Event Photos



Breast Update



EP (Cardiology) Conference



Flood Relief Medical Camp to Kerala



National Paediatric Critical Care Conference

Familial Hypercholesterolemia - A Case Series of Three Children

Dr Minoti S Kale Consultant Pediatric Cardiologist, KMCH



Dr. Minoti S Kale
DNB (Pediatric Cardiology),
Consultant Paediatric Cardiologist

Familial hypercholesterolemia (FH) is an inherited autosomal dominant disorder of lipid metabolism. We report a case series of children aged 5 – 8 years old who presented with deranged lipid profile consistent with FH.

Introduction : Familial hypercholesterolemia (FH) is an autosomal disorder of lipid metabolism characterized by strikingly elevated levels of low density lipoprotein (LDL) cholesterol, cutaneous xanthomas, and family history of premature atherosclerosis. Such patients are at increased risk of developing coronary artery disease and also sudden death unless the condition is recognized and treated promptly. The frequency of the heterozygous form is 1:500 and that of the homozygous form is 1:1,00,000. The most frequent genetic defect is a mutation on the LDL receptor gene, and other rare mutations occur on the ApoB and PCSK9 genes. Clinical manifestations develop earlier in the homozygous form and include tendon xanthomata, arcus cornea, and premature heart disease. Homozygotes

develop planar xanthomas on the fingers and toes by the age of 5 years. Coronary heart disease (CHD), and aortic root stenosis develop during adolescence, and myocardial infarction (MI) develop during the third decade. Heterozygotes develop these features at a later decade during the fourth decade. All the children in study were developmentally appropriate for age and no significant past history. No organomegaly and systemic examination was normal except xanthomas in the 2 boys. X-ray chest, ultrasound abdomen, ECG, echocardiogram, blood sugar, and LFTs were all normal. A diagnosis of FH was made on the basis of family history, characteristic cutaneous xanthomas since early childhood, and elevated levels of total cholesterol and LDL cholesterol. One child 8 yr girl is a heterozygous FH and 2 boys 5 yrs old are homozygous FH.

Patient	Age (years)	Sex	TC (mg/dl)	LDL-C (mg/dl)	HDL (mg/dl)	TG (mg/dl)
A	8	F	300	160	45	80
B	5	M	600	240	30	80
C	5	M	800	300	40	70

Their lipid levels were as follows:

The children were started on atorvastatin 10 mg daily and ezetimibe 20 mg od besides dietary advice. The parents were counselled about the facts related to the disease and advised for regular follow up.

Discussion : Primary hypercholesterolemia occurs as a monogenic defect in lipoprotein catabolism by a mutation in the LDL receptor gene. The rate at which the LDL is removed from the plasma is determined by the heterozygous or homozygous state of the individual. LDL cholesterol is removed from plasma in the heterozygous state at 2/3 of the normal rate resulting in 2 to 3 fold elevation of LDL cholesterol, whereas in the homozygous state, it is removed at 1/3 of the normal rate resulting in 6 to 8 fold elevation of plasma LDL.

Heterozygous FH occurs with prevalence of approximately 1:500 individuals, manifesting clinically between the third and sixth decades. In contrast, homozygous FH occurs very rarely with prevalence of one in million persons. FH homozygotes inherit two abnormal LDL receptor genes, resulting in markedly elevated plasma cholesterol levels ranging between 500 and 1200 mg/dl. Triglycerides are normal to mildly elevated and HDL may be slightly decreased. Receptor negative patients have < 2% normal LDL receptor activity whereas those who are receptor defective may have as much as 25% normal activity and a better prognosis.

Category	Acceptable	Borderline	High
Total cholesterol	<170	170–199	≥200
LDL-C	<110	110–129	≥130
TG			
0–9 y	<75	75–99	≥100
10–19 y	<90	90–129	≥130
Non-HDL-C	<120	120–144	≥145
ApoB	<90	90–109	≥110
Category	Acceptable	Borderline	Low
HDL-C	>45	40–45	<40
ApoA-I	>120	115–120	<115

Abbreviation: ApoA – I, Apolipo Protein A – I

Lipid parameter classification: Adapted from Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. Pediatrics. 2011;128(Suppl 5):S213–56; with permission. HMG CoA reductase inhibitors known as statins are remarkably effective in lowering the LDL cholesterol levels. Combination therapy with ezetimibe, selectively blocking cholesterol absorption in the gut results in further modest decline in LDL levels. All of our patients are on this regimen and we are planning for plasma apheresis in near future.

The American Society for Apheresis (ASFA) recommends cascade filtration plasmapheresis as a standard and acceptable primary treatment modality for FH (category 1). With the cascade filtration system atherogenic lipoproteins are eliminated from plasma, according to their molecular size.

Conclusion: This entity of familial hypercholesterolemia is not that uncommon and needs to be identified and treated at the earliest for better outcomes. Awareness of screening children with family history of early cardiovascular disease (<55 yrs), obesity and skin lesion like xanthomas seen in infancy/childhood is important.

Subarachnoid Haemorrhage - An Emergency That Needs Early State-of-the-art Treatment

Dr. Mathew Cherian, Consultant, Interventional Radiologist **Dr. Suresh Jayabalan**, Consultant, Neuro Surgeon

Dr. Arulselvan & Dr. Selvaraj



Dr. Mathew Cherian
MD., PDCC.,
Consultant Radiologist



Dr. Suresh Jayabalan
MCh., FRCS (Edin), FNS (Japan),
Consultant Neuro Surgeon



Dr. Arulselvan
MD., DM., MRCP (UK), FRCP (Lon),
Consultant Neurologist



Dr. Selvarajan
MD., FICCM
Head Dept. of Anaesthesiology
& Critical Care



Subarachnoid haemorrhage is termed as blood on the surface of the brain. The commonest cause of blood in the subarachnoid space is secondary to a ruptured intracranial aneurysm. Other rare causes can be secondary to trauma, ruptured arteriovenous malformations and even rarely a tumour. At times, no underlying cause can be detected, and it is termed as idiopathic. Aneurysms are more commonly seen in women and is also associated in people who smoke or have hypertension. It is also known to exist in patients with a bicuspid aortic valve or polycystic renal disease.

Patients with subarachnoid haemorrhage classically presents with headache, which is intense and is often described as thunder clap headache. Often, patients become unconscious following a bleed and can also have seizures. A ruptured aneurysm has got a very friable dome. What normally happens is a bleed, which lasts for a few minutes and then automatically stops secondary to a steep increase in intracranial pressure. The point of bleed is sealed with a clot.



However, not every patient survives the first bleed, and the mortality of subarachnoid haemorrhage can reach up to 40% in the first week if not treated since a large number of these aneurysms will re-rupture in the next few days. Thus, it is of paramount importance that a ruptured aneurysm is secured at the earliest to ensure that a re-bleed does not take place.

Securing an aneurysm is currently done by 2 techniques. One, where the skull is opened and a surgical clip is placed across the neck of the aneurysm. This was the gold standard in the treatment for aneurysm until about 2 decades ago.



However, the last 20 years has seen a revolution in the treatment of aneurysm through minimally invasive techniques where a catheter is inserted from a blood vessel in the groin into the aneurysm in the brain and the aneurysm will sac obliterated using multiple fine platinum wires shaped to form coils. Endovascular coiling of aneurysm is today performed whenever feasible in an aneurysm.

At times, wide neck aneurysms may require the assistance of a balloon or stent. Another revolution has been the development of braided tubes called flow diverters, which are used to treat large aneurysms with wide necks, which had no other treatment possible.

Thus, safe surgery and endovascular coiling for this dangerous condition can only be performed in centers where there are trained neuro surgeons and interventional neuro radiologists with state-of-the-art equipment like advanced operating microscopes with facilities to do intraoperative angiography and dedicated neurovascular angio suites with the capability of doing 3D angiography and CT.



Kovai Medical Center and Hospitals is one of the few centers in the country where more than 2000 aneurysms have been treated either by open surgery or endovascular coiling. The safety of these procedures at the Kovai Medical Center and Hospitals is as good as the best centers in the world with on-table complication rate of less than 1%.

The treatment of subarachnoid haemorrhage does not end with securing the aneurysm but also involves intense care in a dedicated neuro ICU. Here again, Kovai Medical Center and Hospitals is a forerunner in this region for advanced critical care. Over the last 25 years, Kovai Medical Center and Hospitals is considered a referral center and a center of excellence in the management of ruptured aneurysms and critical care for patients with subarachnoid haemorrhage.

KMCH MSU and Emergency Neuro Intervention Gives Life A Second Innings

It was a routine day for 29 years old Mrs. X. She was doing her routine afternoon household activities when suddenly she wasn't able to move left side of her body. She tried calling for help and realized her speech was slurred. It was 2 PM in the day, her husband was out for work and her mother in law failed to recognize that these were symptoms of acute stroke. By the time her husband arrived and she was taken to a local hospital. It was 5 PM in the evening. The emergency physician diagnosed this as stroke and immediately alerted the KMCH Mobile stroke Unit (MSU).

The call was received at 5.20 PM and the mobile stroke unit arrived at the destination within next half an hour. On examination patient had complete loss of power (0/5) in both left upper and lower limbs with deviation of mouth to the right – tell-tale signs of stroke. Her BP and sugars were normal. Initial plain CT scan done in the MSU revealed no bleed, and a subtle hypo density involving the right side of her brain (basal ganglia region). Contrast CT (study after injecting contrast into blood vessels) was done which revealed reduced opacification of main artery supplying right side of brain (distal right middle cerebral artery M1 segment) with good filling of distal branches, likely via collaterals concerning for thrombus. Since patient's clinical and imaging diagnosis was established within the window period for thrombolysis (intravenous clot dissolving agent to be given in 3-4.5 hours) and was immediately started with I.V Tenecteplase 20 mg in the mobile stroke unit. The patient was stabilized and rushed to main center for further imaging (MRI).

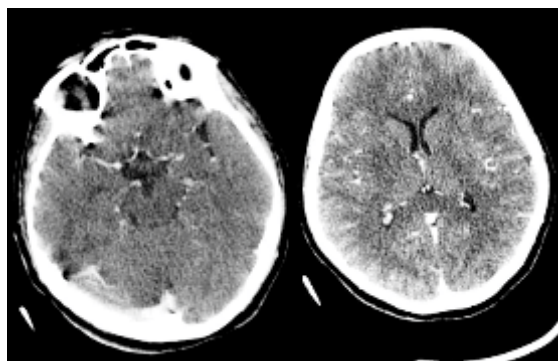
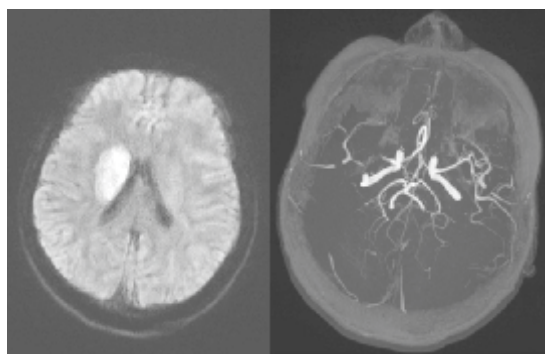


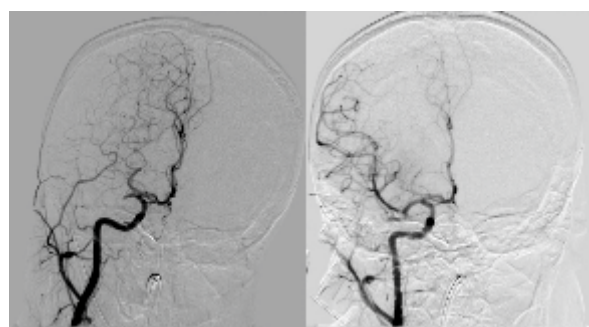
Fig 1: CT obtained in MSU shows possible occlusion in distal right MCA- M1 segment and small hypodensity in lentiform nucleus

MRI taken after reaching main KMCH hospital confirmed vessel occlusion (Right MCA - M1 segment) with infarct (permanently damaged brain parenchyma/tissue) in the basal ganglia (lentiform nucleus). The diffusion ASPECTS score was 8 (scoring system to assess stroke severity on imaging /10, lower score indicating more permanent damage). As the patient was within window period for mechanical thrombectomy (minimally invasive endovascular procedure to remove clot using suction/aspiration catheter device or stent useful in stroke upto 6-24 hours in selected patients) with favorable ASPECTS we proceeded with DSA followed by

Mechanical thrombectomy in our neuro-interventional DSA lab. DSA revealed occluded vessel in right side of her brain (M1 segment of right MCA), which opened up fully with one pass of aspiration catheter (TICI-3 flow - complete distal revascularization).



Rapid MRI obtained at KMCH stroke center reveals the same findings (DWI aspects 8)



DSA pre and post mechanical thrombectomy with TICI-3 Revascularization

Immediately post procedure she regained some power (Grade 2/5) in her left side upper and lower limb and after 3 days she recovered her full power and speech. She was discharged on appropriate medical management (dual antiplatelets) for preventing future episodes after ruling out cardiac/ other causes of stroke.

A Case of Vascular Compromise: Orthopaedic Emergencies - Which cases need Urgent Referral

Dr. Rajavelu MS, MRCS, MCh, FRCS (Ortho), Post CESR

Consultant Orthopaedics, Joint Replacement and Arthroscopy Surgeon, KMCH Sullur



Dr. Rajavelu
MS., MRCS., MCh., FRCS
Consultant in Orthopaedics

"A stitch in time saves nine". It is a common medical myth that orthopaedics has no real emergency. Any limb threatening condition is an emergency which includes the following.

Case: A 9 year old boy was brought to Sullur KMCH last week with history of injury to his left elbow. X ray revealed a completely displaced supracondylar fracture of humerus. He was in a sling. His fingers were well perfused and sensation was normal. Further examination was difficult due to pain on movement.

He was immediately taken to theatre considering the fracture displacement. With hand doppler, both his radial and ulnar artery pulse were absent. Brachial artery was feeble proximal to fracture site. Pulse oximeter did not pick up saturation. Pin prick test revealed no bleeding in finger tips. Attempted closed reduction under C-arm did not revert back the pulse.

Vascular Surgeon was ready in theatre for vascular bypass surgery if there is a clot in the Brachial artery. Our plastic surgeon immediately explored the brachial artery to look for brachial artery injury. There was a significant spasm of Brachial artery with no obvious clot or laceration. Papaverine was sprayed along the brachial artery. Within 15 min radial and ulnar artery pulse returned back. Torn brachialis muscle was cleared from the fracture site, fracture reduced and stabilised with 2 K wires.

The single most important factor determining the outcome of the limb with vascular compromise is the duration of warm ischemia. This child's limb was saved on time, as he was referred to the nearest Multi Speciality hospital where Plastic and Vascular surgeons are readily available.

Vascular injuries should be ruled out in every fracture even if limb perfusion appears normal.

Common vascular injuries	
Injury	Vessel
1 st rib fracture	Subclavian artery/vein
Shoulder dislocation	Axillary artery
Humeral supracondylar fracture	Brachial artery
Elbow Dislocation	Brachial artery
Pelvic fracture	Presacral and internal iliac
Femoral supracondylar fracture	Femoral artery
Knee dislocation	Popliteal artery/vein
Proximal tibial	Popliteal artery/vein

Remember: VON CHOP

V: Vascular Compromise

O: Open (Compound) fracture - Occurs when the skin overlying a fracture is broken, allowing communication between the fracture and the

external environment. Even a tiny puncture wound near fracture site should be treated as open fracture. Advice NPO, take picture, remove macrodebris, immediately cover the wound with sterile wet dressing, splint, Inj TT, Tetglob for major wounds, IV Cefazolin, Amikacin and Metro. Urgent referral to orthopaedics for through irrigation & debridement, skeletal stabilisation and wound coverage by plastic.

N: Neurologic Compromise / Cauda Equina Syndrome - Is a rare and severe type of spinal stenosis causing compression of sacral nerve roots (Cauda Equina) secondary to large central herniated disc/extrinsic mass/infection/trauma. Patient may present with weakness on tip toe walking. H/o Saddle anaesthesia, Sphincter disturbance causing urinary retention or incontinence, faecal incontinence should be asked. If suspected test for perianal sensation (Rt & Lft), anal tone should be done. Urgent referral to Orthopaedics for MRI and decompression within 48hrs to restore bowel and bladder function.

C: Compartment Syndrome (CS) is a serious life and limb threatening complication of extremity trauma Most common in leg and forearm fractures. Can also occur after tight dressing, tight plasters, circumferential burns, snake bites etc. Vicious cycle: Oedema-> Increased compartment pressure->reduced blood flow-> Ischemia->oedema. Symptom: 5 Ps.

Pain: Pain out of proportion in spite of splinting and adequate analgesics. Increased pain on extension of fingers/toes -> NPO-> release tight dressing/plaster->Urgent referral to orthopaedics for fasciotomy. (Note: In CS, pain will increase on limb elevation unlike in swelling).

Paraesthesia Pallor: Impending Muscle Necrosis

Paralysis Pulselessness: too late for decompression. Rhabdomyolysis and renal failure may set in. Fasciotomy will lead to exposure of necrosed muscle and may end up in infection and amputation. If left alone will result in Volkmann's ischemic contracture if the limb survives.

H: Hip Dislocation - Traumatic dislocation of hip is an Orthopaedic emergency. Large force is required to dislocate the joint. Hence other life threatening injuries are common. Posterior dislocations are common. Complications include DVT, Sciatic nerve injury, AVN, Vascular injury. The risk of AVN rises proportional to the time of relocation and should be reduced within 6 hrs. Distal pulse should be compared to check for any difference or absence.

O: Osteomyelitis / Septic Arthritis - Inflammation of synovial membrane with purulent effusion into the joint capsule, followed by articular cartilage erosion by bacterial and cellular enzymes. Hip and Knee joints are most commonly involved. Typically the child will be lethargic, refuse to weight bear unlike irritable hip (transient synovitis) where the child will be otherwise active and can walk with a limp. Hip pathology may present with knee pain.

Antibiotics should not be started before obtaining a synovial fluid sample for analysis. Kocher criteria includes Non weight bearing, Temp > 101 deg F, ESR > 40mm/hr, WBC > 12000/mm cu. The probability for septic arthritis is 3% with one criteria, 40% with two criteria, 93% with three criteria, 99% with all four criteria.

Urgent Orthopaedic referral should be made if septic arthritis is suspected for synovial fluid analysis. With clinical evidence of effusion in the knee joint and US scan evidence of effusion in hip joint, patient should be taken immediately to theatre for aspiration, gram stain, cell count, culture followed by empirical IV antibiotic and arthroscopic washout.

After culture, appropriate IV antibiotic should be given after discussion with infection control physician. After inflammatory markers are normalised antibiotics can be switched over to oral for another 3 more wks.

P: Unstable Pelvic # - Pelvic fracture may be associated with life threatening haemorrhage. Superior gluteal artery is the most common arterial injury. However most of the bleeding comes from venous bleeding and fracture itself. Mortality rate is directly related to shock at the time of presentation. Management always begins with ABC"s.

A pelvic binder or a cloth should be wrapped and secured, IV access and patient should be shifted to the nearest Multi speciality hospital for life saving measures.

KMCH Successfully Treats 100 Year Old Woman with Hip Fracture



Mrs. Parvathi Ammal, a centenarian from Tiruppur was admitted at KMCH hospital on 18th Sep., 2018 with a fracture on her right hip bone following a fall. A team of doctors from various disciplines - Dr. Lenin Babu - Ortho surgeon, Dr. Suresh kumar - Cardiologist and Dr. Balaji - Anaesthetist attended on her. The patient was taken to theatre within 4 hours after initial assessment, Dr. Lenin Babu successfully completed the surgery for her hip using an intramedullary nail (PFN) within 30 minutes. The very next day Parvathi Ammal started walking. Subsequently, she got discharged just after 2 days of hospital stay on Sep. 20th. This was possible because of the multidisciplinary team effort and to the excellent facilities available at KMCH.

Interestingly, the same woman, when she was 98, was admitted in KMCH for fracture of the left hip! That time too, Dr. Lenin Babu performed the surgery. The fracture healed and the old lady was able to carry out all her daily chores quite independently until this particular fall.

The advantage of this kind of hip surgery is that patients, irrespective of their age, can be made to sit and walk immediately after the surgery. The sooner we help the aged to get up on their feet, the better are the chances of their faster recovery and they would quickly get back and resume their normal life. There's no other better example for this than our Parvathi Ammal.

Dr Lenin Babu explains that Osteoporosis (low bone strength) is the most important cause for hip fractures affecting 20 crore women annually. Worldwide close to 1 crore people suffer from osteoporotic fractures which amount to one fracture every 3 seconds of which 20% are hip fractures. The economic burden of managing these fractures easily cross 100 billion US dollars annually. Ageing population, malnutrition, sedentary life style, smoking, excessive alcohol intake, steroids are some of the common causes of osteoporotic fracture. Regular exercises, a healthy lifestyle and checking Bone Mineral Density (BMD) on a yearly basis beyond the age of 45 and getting proper supplements in the form of bisphosphonates and calcium will help reduce the incidence of fracture. Surgery done within 24 hours following a hip fracture increases the success rate by almost 60% when compared to delayed surgery and using an intramedullary nail (as in our case) instead of a plate carries a greater chance of fracture union.

KMCH Chairman Dr.Nalla G Palaniswami while appreciating the team effort, said the hospital is equipped with latest treatment advancement and consultant team to treat old age fractures. The advanced technique adopted in KMCH helps faster recovery and getting back to normal life quickly for the patients in older age group.

The department of Orthopedics & Trauma is known for advanced joint replacement surgery, major complex trauma including pelvic-acetabular fracture management, arthroscopic knee surgeries, paediatric orthopaedic surgeries, spine surgeries, deformity correction and bone tumour management.

KMCH Performs A Complex Spine Surgery for A Morbidly Obese, Young Techy

Obesity is a condition in which a person has excess body fat. Obesity can increase a person's risk of diseases and health problems, including high blood pressure, diabetes and heart disease. It is a complex and a major public health concern worldwide. There are now more than 650 million obese adults, according to a report by World Health Organization.

Obesity increases the risk of developing a number of potentially serious health problems, including Coronary heart disease, high blood pressure, Stroke, Type 2 diabetes, etc. Apart from the above physical problems, obesity may also become an emotional issue. Some people with obesity experience depression, feelings of social isolation and discrimination.



A team of doctors in KMCH led by spine surgeon Dr. Sreedharan Namboothiri were successful in treating a 171 kg (377 pound) weight morbidly obese young man with major spine problems, through a complex spine surgery and exceptional team work. Mr. Geetha Ramanan, a 40-year-old software professional working in Bangalore, had consulted KMCH earlier with suspicious lesions in lung and vertebral lesions and was diagnosed as having TB after an Endobronchial UltraSound (EBUS) test. He was advised

surgery then but was not willing as he was afraid of the risks. He came back after a month with the complaints of inability to walk and inability to pass urine.

There were many challenges in treating such a morbidly obese patient. Transporting him required many people coordination. X-rays will not give proper image. He could not be placed under an MRI machine. We did high resolution CT scan and found that two of the thoracic vertebrae were destroyed and spinal cord was severely compressed. He needed immediate surgery to save the spinal cord from permanent damage.

The destroyed vertebral body was replaced by Titanium cage. The patient had a progressive recovery of leg power in the post-operative period and was sent home in a weeks' time. Appropriate anti TB medications continued and he recovered fully.

Speaking about this, Dr. Nalla G. Palaniswami, Chairman, Kovai Medical Center and Hospital said, "Obesity is one of the major lifestyle diseases which are growing at an alarming rate. As demonstrated in the above mentioned case, KMCH has proven expertise in dealing with obesity related issues. Our hospital is equipped with state of the art medical facilities that effectively complement the efforts of our medical professionals. Having said that I would also like to emphasise that prevention is better than cure. Regular health tests can help early identification of obesity related problems, and that would significantly increase the chances of treatment and cure. Strict adherence to lifestyle modifications as suggested by the doctors is also a must."

Treatment of Low Back Pain by Treating the Annular High Intensity Zone (HIZ) Lesions Using Percutaneous Transforaminal Endoscopic Disc Surgery

Dr. Sreedharan Namboothiri P.E. Department of Orthopaedics and Spine Surgery, KMCH, Coimbatore



Background: The study design was a retrospective case series. The objective was to find the clinical success rate of percutaneous transforaminal endoscopic disc surgery in patients suffering from discogenic chronic low back pain who were showing high intensity zone (HIZ) with degenerated disc as the only abnormality in the magnetic resonance imaging (MRI). The HIZ in the posterior annulus in degenerated disc is recognized as a pain generator. There are only a few studies available in the literature addressing the effect of identification and treatment of HIZ in the chronic low back pain patient.

Dr. Sreedharan Namboothiri P.E.
MS., (Spine Surgery)

Methods: We retrospectively evaluated the case records of all the patients who were treated by percutaneous endoscopic disc surgery for relief of symptoms as determined by visual analog scale (VAS) score, Oswestry Disability Index (ODI), Mac Nab criteria, and the consumption of analgesics, who had the predominant symptom

of chronic low back pain, and whose lumbar spine MRI showed degenerated disc with HIZ and no other cause of back pain, like facet joint arthritis or sacroiliac joint arthritis.

Results: A total of 23 patients were identified to include in the study. Mean preoperative duration of low back pain was 13.1 months. Mean follow up after the procedure was 29 months. At final follow up, 69.6% of the patients were not taking any pain medicines, 17.36% were on

frequent analgesic medicines, 13.04% were on occasional analgesics. There was statistically significant reduction in VAS at 6 weeks postop and final follow up after surgery and the ODI at final follow up; 82.6% of patients had an excellent/good outcome as per Mac Nab criteria. There were no complications or reoperations in any of the patients.

Conclusions: Visualization and ablation of the chronic annular pathology in HIZ may give an effective and minimally invasive treatment for one of the back pain causes.

Endoscopic Minimally Invasive Surgery Keywords: chronic low back pain, high intensity zone, endoscopic ablation, annular tear

Introduction: The significance of high intensity zone (HIZ) in posterior annulus as visualized in T2 weighted magnetic resonance imaging (MRI) in patients with chronic low back pain is being actively discussed and evolving in the literature. The majority of the recent literature supports the significance of HIZ in patients with chronic low back pain. The histology of HIZ containing chronic inflammatory granulation tissue with active inflammatory and pain mediators and free nerve endings have been brought out in the recent studies. Peng et al⁵ did a histologic study of the discs with HIZ in patients undergoing interbody fusion. Recently, percutaneous endoscopic disc surgery has been used in treatment of discogenic low back pain, but not specifically for HIZ. The pathoanatomy of the chronic annular tear with granulation tissue inside and the subsidence of low back pain by ablating that using percutaneous endoscopic discectomy has been documented and emphasized by Yeung and Gore in their comprehensive article. We conducted a retrospective study to find out the effectiveness of percutaneous transforaminal endoscopic disc surgery in patients suffering from discogenic chronic low back pain and showing degenerated disc with HIZ as the only abnormality detected in the MRI.

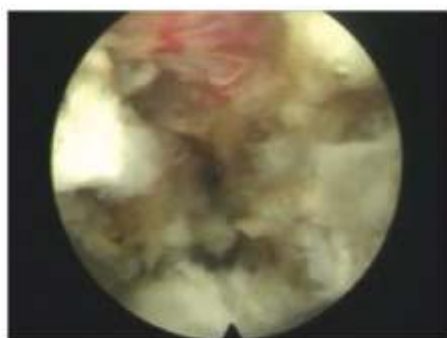


Figure 1. Endoscopic view of the granulation tissue in the posterior annulus.

Methods: In our institute, 96 patients underwent percutaneous transforaminal endoscopic disc surgery from December 2009 to November 2012. From those, we selected the patients for this study who fulfilled the following criteria: Patients who had the predominant symptom of low back pain for a minimum period of 3 months and who were not satisfied with conservative therapy, including analgesics (nonsteroidal anti-inflammatory drugs [NSAIDs] or tramadol and paracetamol in patients who cannot tolerate NSAIDs) and physiotherapy, and whose MRI showed degenerated disc with HIZ as the only abnormality. Patients who completed a minimum of 1 year of follow up was one of the inclusion criteria to find out any sustained pain relief and the development of any untoward effects, like a disc prolapse through the annular rent or instability. A minimum of 1 year of follow up was also the selected criteria by other researchers in endoscopic spine surgery. We excluded the patients who had

HIZ and also had other pathology, like facet or sacroiliac joint arthritis, endplate changes, vertebral hemangiomas, instability, osteoporosis, or deformity. The patients were treated by percutaneous endoscopic disc surgery under local anesthesia with identification of the annular lesion as seen in the MRI and its ablation using radiofrequency or laser (Figures 1 and 2). All the procedures were performed by the corresponding author (SN) in a single institution. The technique we followed is essentially the same described by Yeung et al.¹⁰ The procedure was done under local anesthesia supplemented with conscious sedation using fentanyl and midazolam. The patient was placed prone on a radiolucent table using 2 bolsters and biplanar imaging. A C-arm image intensifier was used to guide an 18 G spinal needle to the posterior annulus. We used a lateral skin entry portal about 13 to 14 cm from midline at about 208 from the horizontal in order to have access to the more midline part of the posterior annulus. The point of annular penetration was in the medial pedicular line. As soon as the needle touched the annulus, 1 mL of 0.5% lignocaine was infiltrated around the annular entry site. A guide wire was passed through the needle and a trocar passed over the guide wire into the disc, over which a beveled 8 mm cannula was introduced. The 258 working channel endoscope was passed intradiscally and the posterior annulus inspected. After removing any loose disc fragments created by the introduction of the cannula, the annular tear and granulation tissue was identified. The granulation tissue in the posterior annulus was seen as reddish areas with bleeding small vessels. The same was treated with low-dose laser (5 to 10 W, 20 Hz, single-pulse mode) or bipolar radiofrequency with a

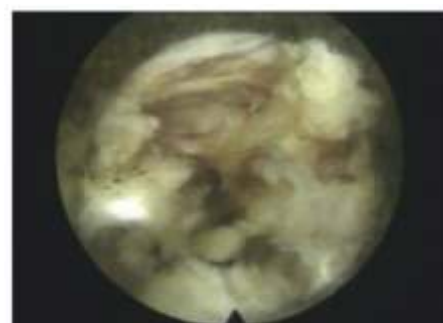


Figure 2. Endoscopic view of the posterior annulus after ablation of the granulation tissue with radiofrequency.

Table 1. Demographic and baseline characteristics of intervention group.

Characteristic	Values (n = 23)
Age, y (mean)	47.78
Female, no. (%)	13 (56.5%)
Male, no. (%)	10 (43.5%)
Smoker, no. (%)	5 (21.7%)
Alcoholism, no. (%)	4 (17.3%)
Diabetes, no. (%)	14 (60.8%)
Hypertension, no. (%)	7 (30.4%)
Ischemic heart disease, no. (%)	1 (4.3%)
Physically demanding occupation, no. (%)	16 (69.6%)
Sedentary (office type) occupation, no. (%)	7 (30.4%)
Preoperative VAS score mean	7.27 (range 6.1 to 8.3)
Preoperative ODI score mean	45.27% (range 26.60 to 66.60%)

Abbreviations: ODI, Oswestry Disability Index; VAS, visual analog scale.

sustained effect on pain relief. Any complications recorded perioperatively or during the follow up were noted. In endoscopic surgery, neurovascular injury, dural tear, and infection (discitis) are possible perioperatively, though rare. In the follow-up period, instability and a disc prolapse due to the annular rent are possibilities. The outcome assessments were

Table 2. Duration of pain before procedure and duration of follow up after treatment.

	Mean \pm SD (Mo)	Range (Mo)
Duration of pain before treatment	13.1 \pm 15	3–50
Duration of follow up after the procedure	29 \pm 8.5	12–41

percutaneous endoscopic disc surgery for predominant radicular pain or predominant back pain. Out of the total 96, 37 patients were operated for predominant low back pain. As per file records, 26 of these 37 had HIZ in the posterior annulus. Of the 26 patients, 3 were excluded as the duration of their follow up was less than 12 months (2 of them were followed up for 6 weeks and were completely painless at that time. One of them was followed for 7 months and had persistent pain and was on continuous analgesic medicines though maintaining the same level of activity); 23 remained for the analysis.

We have used the following outcome measures: Mac Nab criteria for relief of back pain and return to work, the 11 point (0 to 10) visual analog scale (VAS) score for pain, and the Oswestry Disability Index (ODI) Version 2.0 (the section on sex was omitted as the study population was not willing to discuss sexual activity due to social custom) for improvement in the daily activities. In addition, the consumption of analgesics was also considered as an indirect measure of pain. We consider a 50% reduction of VAS score or ODI and an excellent/good Mac Nab outcome as a successful clinical outcome.

Table 3. Outcomes as measured by Mac Nab criteria.**Table 3.** Outcomes as measured by Mac Nab criteria.

Mac Nab Criteria	6 Wk. No. (%)	Final Follow Up, No. (%)
Excellent (no pain and full return to work)	13 (56.5%)	15 (65.2%)
Good (occasional back pain interfering with normal work)	10 (43.5%)	4 (17.4%)
Fair (better than preoperative status but has to modify work due to pain)	0 (0%)	4 (17.4%)

Table 4. Outcomes as measured by visual analog scale (VAS) and Oswestry Disability Index (ODI).

Outcome Measures (n = 25)	Range	Mean \pm SD
Postop VAS (6 wk)	4.4–1.1	2.75 \pm 0.94
Postop VAS last follow up	4.5–0	2.34 \pm 1.51
Postop ODI last follow up	42.20–0%	16.58 \pm 16.35%

Table 5. Mean change and percentage change in outcome measures (n = 23; paired sample t tests).

	Preop Mean \pm SD	6 Wk Postop Mean \pm SD	Last Follow Up Mean \pm SD	Change Mean \pm SD	95% Confidence Interval	P Value
VAS	7.28 \pm 0.79	2.75 \pm 0.94		4.52 \pm 0.7	4.22–4.82	<.001
	7.28 \pm 0.79		2.34 \pm 1.51	4.94 \pm 1.48	4.3–5.58	<.001
		2.75 \pm 0.94	2.34 \pm 1.51	0.42 \pm 1.11	–0.66–0.9	.08
ODI	45.27 \pm 12.91%		16.58 \pm 16.35%	28.7 \pm 11.3%	23.8–33.6%	<.001

Abbreviations: VAS, visual analog scale; ODI, Oswestry Disability Index.

change. For statistical tests, a P value of .05 was taken as statistically significant.

Results: There were 10 males and 13 females, mainly of a middle aged population (mean age \pm 47.78 years). The majority (69.6%) were engaged in physically demanding jobs, including household activities and working in the field (Table 1). Patients suffering due to pain from 3 to 50 months were operated on. Mean preoperative duration of low back pain was 13.1 months. Patients were followed up for a minimum period of 12 months to a maximum of 41 months after the procedure. That is, their last follow-up assessment was from 12 to 41 months after the procedure. Mean follow up after the procedure was 29 \pm 8.5 months (Table 2). Nineteen (82.6%) of the 23 patients had a good/ excellent outcome as per Mac Nab criteria at the last follow up. In short, they were able to return to the same level of activity as before the onset of pain (Table 3).

Statistical Methods: We used the IBM SPSS version 20 software for analysis of the data. Paired sample t tests were used for deriving the mean difference, percentage change, and SD

There was a decrease in mean VAS score from preop to 6 weeks follow up by 4.52 6 0.7 points. These patients experienced a 61.17% decrease in VAS score from preop to 6 weeks postop (Tables 4 and 5). There was a decrease in mean VAS score from preop to last follow up by 4.94 6 1.48 points. These patients experienced a 67.95% decrease in VAS score from preop to the last follow up, which was at least 12 months after the procedure (Tables 4 and 5). When the mean VAS scores at 6 weeks and last follow up were compared, there was only a modest change (0.42 6 1.11). There was a further improvement of only 15.27% in VAS score from 6 weeks after surgery to the last follow up at least 12 months after the procedure (Tables 4 and 5). There was a decrease in mean ODI score from preop to the last follow up by 28.7 6 11.3%. The percentage reduction in ODI from preop to postop was 63.39%, when the follow-up assessment was done after a minimum of 12 months after the procedure (Tables 4 and 5). At the last follow up, 16 (69.6%) of the 23 patients were not taking any pain medicines; 4 (17.36%) were on frequent analgesic medicines, more than 3 doses of analgesics a week; 3 (13.04%) were on occasional analgesics, not more than 1 dose of analgesic in a fortnight. There were no complications or reoperations in any of the study patients.

Discussion: It seems beneficial to treat the chronic ulcerlike lesion of HIZ in the posterior annulus in patients with chronic low back pain by adequate debridement of the granulation tissue. Percutaneous endoscopic disc surgery is likely to provide effective motion-preserving treatment for these patients who are usually undertreated by neglect or overtreated by fusion surgery. The HIZ lesions are visualized while looking from inside the disc only, as they are covered by posterior longitudinal ligament (probably none of us noticed them while doing a discectomy even under the microscope).

The use of endoscopy has thus a specific advantage in treating these lesions. The strength of the study is that we used ODI as an outcome measurement, which is a validated measure for back pain. We also used VAS score and Mac Nab criteria to measure the outcome of treatment like other current authors. This study has some limitations. No comparison groups are available, and this is a retrospective case series. Though assessed independently, this was not a blinded study.

The study is based on a small number of patients, largely due to the strict exclusion criteria. If the images showed any other abnormality, like facetar arthritis, instability or disc space collapse, or sacroiliac arthritis, that was not treated endoscopically. The observation that VAS at 6 weeks versus final follow up is not statistically significant can be explained by the initial improvement due to the surgery in the majority of the patients. However, there is a need for a well-controlled comparative study prospectively assessing the outcomes in a large number of patients before recommending this as the standard of care.

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Recurrent Fever in an 8-year-old Diagnosed by Masterly Inactivity!

Dr. Arunkumar. A M.D.(Pediatrics) **Dr. Prabhu Marudhamuthu** M.Ch. (Neurosurgery) - KMCH, Erode



*Dr. Arun Kumar
Consultant Paediatrics*



*Dr. Prabhu Marudhamuthu
Consultant Neuro & Spine Surgeon*

An eight-year-old female child presented to us with recurrent fever episodes – high grade with chills and vomiting with no other associated symptoms. Investigations during each episode revealed high WBC counts with neutrophilic predominance and elevated CRP levels. The child never presented with any foci even after meticulous examination. Cultures were sterile almost every time and child was started on empirical antibiotics, mostly ceftriaxone. The child always had a remarkable improvement with the same. She has been getting such episodes multiple times in the past 2 years. Except for some rhinitis and caries, a focus was never identifiable. Hence, the child underwent thorough examination including TB workup, ENT workup, CT PNS, 2D ECHO, rheumatological, auto immune, hematological workup and ultrasound abdomen but in vain.

In the latest visit, when the child presented with same features, we decided to wait and watch without giving any treatment. The child presented to us on 5th day of fever with severe headache, vomiting and neck rigidity suggesting meningitis. CSF examination revealed bacterial meningitis with 3200 cells, 98% polymorphs, glucose – 32 mg/dl, protein – 256 mg/dl. CSF Cultures and PCR panel couldn't identify any organisms. This time too she excellently responded to ceftriaxone. We assumed, all of the previous fever episodes were probably features of meningism in early stages. When we started to look for causes for recurrent meningitis, we noticed persistent clear discharge from nose aggravated by bending the head down. Voila - it was CSF rhinorrhea that was put aside in the past as some allergic rhinitis. Trauma history was negative. Neurosurgeon opinion was obtained and CT cisternogram was performed which confirmed the site of leak which was found in the anterior skull base (right cribriform plate). The child underwent anterior cranial fossa repair in two layers using bone cement and fascia lata graft. The child is doing well now with no further episodes.

CSF leaks commonly occur after trauma or are rarely congenital. Posttraumatic CSF rhinorrhea may heal spontaneously. The diagnosis is made by clinical and CSF examination. The workup includes a high-resolution CT or MRI of the brain with cisternography. The management includes treatment of meningitis with antibiotics and surgical repair of the dural defect. Surgical repair options include intracranial and endoscopic extracranial approaches wherein an underlay, overlay, or a combined graft is placed. CSF rhinorrhea misdiagnosed as allergic rhinitis or presenting as recurrent meningitis has been documented in literature multiple times.



Antibiotics:

The Double Edged Sword its all About Picking the Right Drug for the Right Bug!

Dr. Varun Sundaramoorthy MD (General Medicine), PDF Infectious Diseases (CMC Vellore)



*Dr. Varun Sundaramoorthy
MD(Gen.Med.),
Consultant in Infectious Disease*

Antibiotics are the most important weapons for the treatment of many infectious diseases caused by bacteria. Antibiotics are substances that destroy the bacteria without harming the host, human. Etymologically, the word comes from the (anti-biotic) means anti-against and biotic- used for life. It accounts for up to 50% of a hospital's drug expenditure, Studies worldwide has shown a high incidence of inappropriate use.

The rationality of antibiotics are the most controversial and debated issue in today's clinical practice. Irrational antibiotics/antibacterials (ABs) usage is a global problem especially in developing countries resulting in an increased emergence of resistance to most common bacteria, higher cost of treatment, prolonged hospitalization and adverse drug reactions. Promoting the rational use of medicines would definitely help mankind to fight the disease and the illnesses for a better tomorrow.

Antibiotics are either natural substances that are produced in nature by microorganisms or synthetic substances, which have been prepared in the laboratory. To be considered a clinically effective antibiotic and therefore useful in medicine, the destruction or growth inhibition of the microorganism is achieved in the respective concentrations of the antibiotic in the body . To date, at least 4,000 antibiotics have been isolated from cultures of microbes and 30,000 have been prepared semisynthetic. In every day practice, however, only 100 of these are used.

Antibiotics may be :

- Wide spectrum kill many types of bacteria e.g. penicillin. The broad spectrum antibiotics are active against many types of microbes such as bacteria, rickettsia, mycoplasmas, protozoa, and spirochetes.
- Narrow spectrum which kill certain types of bacteria e.g. isoniazid and should be used where possible to reduce the risk of colonization and super infection with resistant bacteria. Basically, antibiotics are classified as bactericidal that kill germs, or bacteriostatic, preventing the growth of bacteria.

These classifications are based on laboratory behavior of antibiotics, but in fact, both of these groups are able to treat a bacterial infection . There are a number of factors which should be considered for each host when administering antibiotic formulations.

- Genetic factors such as lack of G6PD
- Renal and hepatic impairment are factors that will determine the type of antibiotic.
- Bactericidal drugs are necessary for life threatening infections such as sepsis.
- Diseases such as tumours, lymphomas, vasculitides and systemic diseases.
- Infections where the administration of antibiotics should be immediate because the presence of infection is life threatening. Such examples include meningitis, bacterial endocarditis, leukopenia and acute necrotizing cellulitis. Before the administration of antibiotics, anaerobic, aerobic cultures should be taken which must be monitored because after the initial treatment, failure will therefore change initial therapeutic regimen .

Antimicrobials can obviously be important or even lifesaving in appropriate situations, but it is just as important to prevent unnecessary use of antimicrobials which can lead to resistance. Rational use of drugs requires that patient receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, at the lowest cost to them and their community. Irrational use of antibiotics should be checked as injudicious use which can adversely affect the patient; cause emergence of antibiotic resistance and will increase the cost.

Reasons for appropriate use

- Avoid adverse effects on the patient
- Avoid emergence of antibiotic resistance – ecological or societal aspect of antibiotics
- Avoid unnecessary increases in the cost of health care

Irrational Use Of Antibiotics

- Increased treatment costs.
- Interference with patient's normal flora.
- Selection of drug resistant organisms.
- Increased incidence of untoward side effects.

Solution

Antibiotic policy

- Direction
- Education
- Monitoring & evaluation

Direction

Frame the hospital own list of therapeutic antibiotic categories:

- First-line
- Reserved agents
- Restricted agents
- Withdrawn agents

Produce protocol for prophylactic antibiotics

- Chemoprophylaxis in surgery
- Prevention of endocarditis & prosthetic infections.
- Protection of granulocytopenic patients

Develop implementation strategies:

- At clinicians-level
- At hospital pharmacy-level

Education

- Introduce policy and protocol to clinicians
- Formal refreshment courses about antibiotics
- Address identified deficiencies

Monitoring & Evaluation

Monitoring – Antimicrobial audits: surveys to determine appropriate and inappropriate usage of antimicrobials

Evaluation :

- Impact on cost
- Impact on bacterial resistance
- Improvement of patient care

Message for Health professionals

- Too many antibiotics together may act synergistically rather than competitively. The majority of infections can be treated with an antibiotic. But there are cases where it is necessary to combine the administration of antibiotics. This is the case where a polymicrobial infection. For examples intraventricular brain abscesses and infections of the lower limbs of diabetic patients
- The use of many antibiotics results in more side effects. Adverse reactions to antibiotics are common and are divided into idiosyncratic, allergic and dose-dependent. Examples of serious allergic reactions are immediate hypersensitivity reaction to penicillin (laryngeal edema, circulatory collapse). When a patient taking many antibiotics had an allergic reaction, then all antibiotics are suspect and cannot reuse .
- The use of many antibiotics increases the risk of infection with resistant micro-organisms. When many antibiotics are administered to a patient, the spectrum of microorganisms killed is increased. The destruction of the flora of the oropharynx and gastrointestinal tract are harmful to humans. The micro-organisms that are normally found in these regions are competing to develop more resistant micro-organisms. The elimination of the normal flora of the indiscriminate use of antibiotics has resulted in the development of multiresistant pathogenic microorganisms

Conclusion: Antibiotics are an essential tool of medical use in common medical procedures, such as transplantation and chemotherapy. However, over the years, bacteria have acquired resistance to antibiotics. Resistant bacteria can be transmitted from animals to humans through the food chain or by direct contact. Many bacterial infections are becoming resistant to the treatments most commonly prescribed antibiotics.

The resistance of pathogenic microorganisms to antibiotics not only a problem for the patient, but also for the environment as the members of the household are populated by the same pathogen and are more likely to become ill due to this. So doctors and other professionals should prescribe antibiotics only when necessary, based on existing guidelines.

Event Photos



Pathology Conference



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Rose Day



Trauma Series - 1



World Mental Health Day

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Dr. Varun Sundaramoorthy
MD (General Medicine).,PDF (Infectious Diseases).,
Consultant - Medicine and Infectious Diseases
(KMCH - Main Center)



Dr. Arun Balaji
MS., MCh (Neuro Surgery).,
Consultant Neuro Surgeon
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