Healthy Heart

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Rise of Cardiovascular Medicine 2013

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Modern cardiology was born at the turn of the nineteenth to twentieth centuries backed with three great discoveries including x ray, sphygmomanometer and electrocardiograph. Cardiac catheterization, coronary angiography, cardiovascular surgeries including coronary artery bypass graft, heart transplantation, and development of coronary care unit were invented during twentieth century. Assembling it coronary care unit houses on four main pillars including continuous electrocardiographic monitoring with arrhythmia alarms, cardiopulmonary resuscitation with external ventricular de-fibrillation, treating patients in a discrete unit of the hospital with skilled personnel, drugs, and equipment with a change in policy that permitted, trained nurses to initiate resuscitation.

The concept of preventive cardiology was developed in 1941 by identification of hypertension, smoking, and electrocardiographic evidence of left ventricular hypertrophy as cardiovascular disease risk factors. Late twentieth century cardiovascular medications including beta-blockers, angiotensin-converting enzyme inhibitors, and statins have prolonged and improved the quality of life of millions of patients worldwide. Invention of diagnostics like echocardiography and other imaging techniques and use of pacemakers and internal defibrillators are paradigm shifts of cardiovascular treatment.

Genesis of cardiology subspecialty-Interventional cardiology led to development of percutaneous trans luminal coronary angioplasty procedure. Bare Metal Stent (BMS) and Drug Eluting Stent (DES) found in 1990s and 2000s have evolved to use of absorbable polymers and non-polymeric surfaces and bio absorbable scaffolds.

Aortic valve replacement is a great challenge for physicians. Percutaneous valve repair/replacement is done by core valve re-valving system and Criber-Edwards heart valve. Different transcatheter techniques including-edge-to-edge, spacer, folding, and neochordae to treat mitral regurgitation (MR) at leaflet level will be/are used. Transcatheter annuloplasty reduces MR.

Heart failure is a critical battleground in cardiology. Use of new CRM-type devices and pressure sensors manages it. Ventricular partitioning, cell therapy, gene therapy, renal denervation and mitral valve repair are also useful in heart failure management. Endarterectomy, stenting, and neuroprotection are mainstay of carotid artery interventions. Use of endocardial interventions is easier than pericardial interventions. Hybrid revascularization is an integrated revascularization and combination of percutaneous and surgical techniques for revascularization of CAD.

Today cardiology is a vibrant and robust speciality. The major challenges include primary prevention/risk assessment, update and implementation of evidence-based guidelines, genetic screening, pharmacogenomics, and development of biobanks. Developmental challenges include- gene therapy, stem cell therapy, xenotransplants and novel drugs, integration of imaging techniques, receptor imaging, and plaque imaging. Areas of research extend to development of new coronary artery intervention techniques; biodegradable coronary stenting; tissue modification; invasive treatment of heart failure and arrhythmias; percutaneous valve replacement; new surgical techniques and organization of cardiology practice and home monitoring.

Today's need is prevention, best achieved by increasing public awareness through regional coordination, developing ambulance ECG system and other services. Twenty years down the line- electronic health record, biological samples and digitized images and healthcare will be more personalized. Use of aggregate records will monitor community health. Geriatric population, diabetics, obese and previously operated patients will be benefitted.

Geographic Information System (GIS) tools will manage, visualize, explore, inquire, edit, and analyze information linked to geographic locations, displaying data as maps, tables, and charts. Most patients will have access of 4G low cost radio chips which can be used without phones, smart pumps, monitors and wheelchairs. Advances in genetics and genomics will allow identification of risk factors, sub classification of disease, leading to personalized gene-informed therapy. Cardiovascular disease will no longer exist as a threat. The principal role of the cardiologist will change from recognizing and managing established disease, as is the case today, to interpreting and applying genetic information in prevention and treatment in 2020 and beyond.

Newer Antiplatelet Agents in ACS - Where, Which, Why and How?

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Activation and aggregation of platelets play a key role in thrombus formation in the heart and arterial system. Antiplatelet drugs are therefore important for the prevention and treatment of intracardiac and arterial thrombosis and their consequences. Various clinical studies are conducted before new antiplatelet agents come in practice. The concept of data aggregation for new antiplatelet agents is based on clinical evidence, guidelines, performance indicators, measurement and feedback, and quality improvement initiatives. There are four main classes of antiplatelet drugs. Acetylsalicylic acid (ASA), better known as aspirin, is the most widely used antiplatelet therapy. ASA acts by inhibiting the synthesis of thromboxane A2. ADP-receptor antagonists/P2Y12 receptor antagonists (clopidogrel and ticlopidine); prasugrel, cangrelor (IV) and AZD6140 are in phase III clinical development. Dipyridamole is the third class of antiplatelet drugs which increases levels of the second messengers cAMP and cGMP within platelets. Glycoprotein IIb/IIIa antagonists inhibit the binding of fibrinogen

to its receptor by inhibiting platelet aggregation.

Clopidogrel is an excellent, well studied drug with long and extensive clinical experience in ACS/PCI patients. Prasugrel is a newer thienopyridine which irreversibly binds to P2Y12. It is more rapid in onset of action with stronger inhibitory effect than clopidogrel and lower variability in platelet response. Ticagrelor is a new class of P2Y12 inhibitor. It is a direct-acting (not a prodrug) Cyclo-Pentyl-Triazolo-Pyrimidine (CPTP). Ticagrelor is superior to clopidogrel for several outcomes including death, MI, and stent thrombosis in patients presenting with ACS. Cangrelor is an intravenous P2Y12 Inhibitor with 3-5 minutes plasma half-life. It is a direct and reversible P2Y12 inhibitor and more potent than clopidogrel (90% inhibition of platelet aggregation at 1 - 4 mcg/kg/min IV).

Elinogrel is a P2Y12 antagonist with no CYP effect. It is a first agent in this class in both IV and oral formulations. It is advantageous when used acutely in the cath lab. E 5555 are orally active antagonists of protease-activated receptor 1 (PAR 1) with potential antithrombotic and anti-inflammatory benefits. Based on various clinical studies, prasugrel and ticagrelor are superior to clopidogrel; rivaroxaban is promosing, and apixaban leads to excess bleeding with less benefits. A platelet thrombin receptor (PAR-1) antagonist including Atopaxar, is encouraging with some additional bleeding. To put into nutshell, most of the effect of antiplatelet therapy is on MI reduction besides mortality reductions are also possible. (Based on COMMIT; PLATO study data). Balance of efficacy and safety is challenging, especially with combinations of antithrombotics.

Leveraging Web 2.0 Tools for Information Management and Staying Current with Literature

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Today's physicians are facing a dual threat of information overload and shrinking half-life of knowledge. How can a busy practitioner stay up to date with current medical evidence in his or her area of interest? It is apparent that the human brain has limitations in processing this vast amount of information in a manner that is easy to retrieve at a time of need. You can feel like Karna in the epic Mahabharata when his memory fails him at a time he needs it the most.

In this session we will explore the neuropsychological basis of memory and technology tools that can assist you in staying current with literature in your area of interest or expertise. We will review concepts of working

memory, transactive memory and filter failure. Using practical examples, we will review a model for a centralized online location that filters and collects information and allows you to annotate, store and retrieve it in an efficient manner. This model works on any web-enabled device and can be applied at the point-of-care. We will see a stepwise approach that will allow you to easily adopt this model in your own practice.

Social Media and Social Networking for Life Long Learning : What all Physician should know ?

Medical practitioners need to be lifelong learners. A vast majority of the information we need to practice medicine today, we learned "on the job", not in medical school. Medications and diseases and ways of treating them are constantly evolving. We are faced with SARS, Chikungunya, Dengue, Influenza pandemics and the like and we will see more of these as the world becomes flatter and smaller. But there is a silver lining - we are also increasing hyperconnected and able to form global knowledge communities that can work together to develop and share approaches for treating and managing these.
While Facebook, Twitter and Google Plus can seem like frivolous time sinks, they can also provide a framework for building virtual personal learning networks.

In this session we will explore the concept of Connectivism and how we can leverage social media tools to help us become lifelong learners. We will see practical examples of using social networking for synchronous case discussion, asynchronous journal clubs and crowdsourced problem solving. The session will provide links to resources for you to learn to adopt these in your own practice.

Managing your Professional Identity in the Digital age:

In an age when "Google" has become a verb, people are increasingly looking up information on the Web for themselves rather than asking someone for an opinion. This trend is going to increase as the amount of online digital information increases, more people have smartphones with voice recognition and natural language processing apps like Siri and Google Now, and we move towards wearable computers like Google Glass.

We have traditionally told our medical trainees not to use social networking sites like Facebook in case they post something inappropriate that can hurt them in the future. Unfortunately, if we stand by the sidelines, we lose our chance to control our own digital footprint. In this session we will look at advantages of controlling your own professional identity. We will review tools and steps for actively managing and monitoring your own digital persona.

Trials of 2012 which Changed my Clinical Practice

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I Cardiovascular Benefits and Diabetes Risks of Statin Therapy in Primary Prevention: An Analysis from the JUPITER trial

Paul M Ridker, Aruna Pradhan, Jean G MacFadyen, Peter Libby, Robert J Glynn: (Lancet 2012; 380: 565–71)

Background:

In view of evidence that statin therapy increases risk of diabetes, the balance of benefit and risk of these drugs in primary prevention has become controversial. We undertook an analysis of participants from the JUPITER trial to address the balance of vascular benefits and diabetes hazard of statin use.

Methods:

In the randomised, double-blind JUPITER trial, 17 603 men and women without previous cardiovascular disease or diabetes were randomly assigned to rosuvastatin 20 mg or placebo and followed up for up to 5 years for the primary endpoint (myocardial infarction, stroke, admission to hospital for unstable angina, arterial revascularisation, or cardiovascular death) and the protocol-prespecified secondary endpoints of venous thromboembolism, all-cause mortality, and incident physician-reported diabetes. In this analysis, participants were stratified on the basis of having none or at least one of four major risk factors for developing diabetes: metabolic syndrome, impaired fasting glucose, body-mass index 30 kg/m² or higher, or glycated haemoglobin A1c greater than 6%.

Findings:

Trial participants with one or more major diabetes risk factor (n=11 508) were at higher risk of developing diabetes than were those without a major risk factor (n=6095). In individuals with one or more risk factors, statin allocation was associated with a 39% reduction in the primary endpoint (hazard ratio [HR] 0·61, 95% CI 0·47–0·79, p=0·0001), a 36% reduction in venous thromboembolism (0·64, 0·39–1·06, p=0·08), a 17% reduction in total mortality (0·83, 0·64–1·07, p=0·15), and a 28% increase in diabetes (1·28, 1·07–1·54, p=0·01). Thus, for those with diabetes risk factors, a total of 134 vascular events or deaths were avoided for every 54 new cases of diabetes diagnosed. For trial participants with no major diabetes risk factors, statin allocation was associated with a 52% reduction in the primary endpoint (HR 0·48, 95% CI 0·33 0·68, p=0·0001), a 53% reduction in venous thromboembolism (0·47, 0·21–1·03, p=0·05), a 22% reduction in total mortality (0·78, 0·59–1·03, p=0·08), and no increase in diabetes (0·99, 0·45–2·21, p=0·99). For such individuals, a total of 86 vascular events or deaths were avoided with no new cases of diabetes diagnosed. In analysis limited to the 486 participants who developed diabetes during follow-up (270 on rosuvastatin vs 216 on placebo; HR 1·25, 95% CI 1·05–1·49, p=0·01), the point estimate of cardiovascular risk reduction associated with statin therapy (HR 0·63, 95% CI 0·25–1·60) was consistent with that for the trial as a whole (0·56, 0·46–0·69). By comparison with placebo,

statins accelerated the average time to diagnosis of diabetes by 5·4 weeks (84·3 [SD 47·8] weeks on rosuvastatin vs 89·7 [50·4] weeks on placebo).

Interpretation:
In the JUPITER primary prevention trial, the cardiovascular and mortality benefits of statin therapy exceed the diabetes hazard, including in participants at high risk of developing diabetes.

II Strategies for Multivessel Revascularization in Patients with Diabetes
The FREEDOM Trial Investigators: (N Engl J Med 2012, Nov 7)

Background:
In some randomized trials comparing revascularization strategies for patients with diabetes, coronary-artery bypass grafting (CABG) has had a better outcome than percutaneous coronary intervention (PCI). We sought to discover whether aggressive medical therapy and the use of drug-eluting stents could alter the revascularization approach for patients with diabetes and multivessel coronary artery disease.

Methods:
In this randomized trial, we assigned patients with diabetes and multivessel coronary artery disease to undergo either PCI with drug-eluting stents or CABG. The patients were followed for a minimum of 2 years (median among survivors, 3.8 years). All patients were prescribed currently recommended medical therapies for the control of low-density lipoprotein cholesterol, systolic blood pressure, and glycated hemoglobin. The primary outcome measure was a composite of death from any cause, nonfatal myocardial infarction, or nonfatal stroke.

Results:
From 2005 through 2010, we enrolled 1900 patients at 140 international centers. The patients' mean age was 63.1±9.1 years, 29% were women, and 83% had three vessel disease. The primary outcome occurred more frequently in the PCI group (P = 0.005), with 5-year rates of 26.6% in the PCI group and 18.7% in the CABG group. The benefit of CABG was driven by differences in rates of both myocardial infarction (P<0.001) and death from any cause (P = 0.049). Stroke was more frequent in the CABG group, with 5-year rates of 2.4% in the PCI group and 5.2% in the CABG group (P = 0.03).

Conclusions:
For patients with diabetes and advanced coronary artery disease, CABG was superior to PCI in that it significantly reduced rates of death and myocardial infarction, with a higher rate of stroke.

III Prasugrel versus Clopidogrel for Acute Coronary Syndromes without Revascularization
The TRILOGY ACS Investigators (N Engl J Med 2012; 367:1297-309)

Background:
The effect of intensified platelet inhibition for patients with unstable angina or myocardial infarction without ST-segment elevation who do not undergo revascularization has not been delineated.

Methods: In this double-blind, randomized trial, in a primary analysis involving 7243 patients under the age of 75 years receiving aspirin, we evaluated up to 30 months of treatment with prasugrel (10 mg daily) versus clopidogrel (75 mg daily). In a secondary analysis involving 2083 patients 75 years of age or older, we evaluated 5 mg of prasugrel versus 75 mg of clopidogrel.

Results:

At a median follow-up of 17 months, the primary end point of death from cardiovascular causes, myocardial infarction, or stroke among patients under the age of 75 years occurred in 13.9% of the prasugrel group and 16.0% of the clopidogrel group (hazard ratio in the prasugrel group, 0.91; 95% confidence interval [CI], 0.79 to 1.05; P = 0.21). Similar results were observed in the overall population. The prespecified analysis of multiple recurrent ischemic events (all components of the primary end point) suggested a lower risk for prasugrel among patients under the age of 75 years (hazard ratio, 0.85; 95% CI, 0.72 to 1.00; P = 0.04). Rates of severe and intracranial bleeding were similar in the two groups in all age groups. There was no significant between-group difference in the frequency of non-hemorrhagic serious adverse events, except for a higher frequency of heart failure in the clopidogrel group.

Conclusions:

Among patients with unstable angina or myocardial infarction without ST-segment elevation, prasugrel did not significantly reduce the frequency of the primary end point, as compared with clopidogrel, and similar risks of bleeding were observed.

IV Basal Insulin and Cardiovascular and other Outcomes in Dysglycemia The ORIGIN Trial Investigators: (N Engl J Med 2012; 367:319-28)

Background:

The provision of sufficient basal insulin to normalize fasting plasma glucose levels may reduce cardiovascular events, but such a possibility has not been formally tested.

Methods:

We randomly assigned 12,537 people (mean age, 63.5 years) with cardiovascular risk factors plus impaired fasting glucose, impaired glucose tolerance, or type 2 diabetes to receive insulin glargine (with a target fasting blood glucose level of ⩽95 mg per deciliter [5.3 mmol per liter]) or standard care and to receive n–3 fatty acids or placebo with the use of a 2-by-2 factorial design. The results of the comparison between insulin glargine and standard care are reported here. The co-primary outcomes were nonfatal myocardial infarction, nonfatal stroke, or death from cardiovascular causes and these events plus revascularization or hospitalization for heart failure. Microvascular outcomes, incident diabetes, hypoglycemia, weight, and cancers were also compared between groups.

Results:

The median follow-up was 6.2 years (interquartile range, 5.8 to 6.7). Rates of incident cardiovascular outcomes were similar in the insulin-glargine and standard-care groups: 2.94 and 2.85 per 100 person-years, respectively, for the first co-primary outcome (hazard ratio, 1.02; 95% confidence interval [CI], 0.94 to 1.11; P = 0.63) and 5.52 and 5.28 per 100 person-years, respectively, for the second coprimary outcome (hazard ratio, 1.04; 95% CI, 0.97 to 1.11; P = 0.27). New diabetes was diagnosed approximately 3 months after therapy was stopped among 30% versus 35% of 1456 participants without baseline diabetes (odds ratio, 0.80; 95% CI, 0.64 to 1.00; P = 0.05). Rates of severe hypoglycemia were 1.00 versus 0.31 per 100 person-years. Median weight increased by 1.6 kg in the insulin-glargine group and fell by 0.5 kg in the standard-care group. There was no significant difference in cancers (hazard ratio, 1.00; 95% CI, 0.88 to 1.13; P = 0.97).

Conclusions:

When used to target normal fasting plasma glucose levels for more than 6 years, insulin glargine had a neutral effect on cardiovascular outcomes and cancers. Although it reduced new-onset diabetes, insulin glargine also increased hypoglycemia and modestly increased weight.

V Warfarin and Aspirin in Patients with Heart Failure and Sinus Rhythm
The WARCEF Investigators: (N Engl J Med 2012; 366:1859-69)

Background:

It is unknown whether warfarin or aspirin therapy is superior for patients with heart failure who are in sinus rhythm.

Methods:

We designed this trial to determine whether warfarin (with a target international normalized ratio of 2.0 to 3.5) or aspirin (at a dose of 325 mg per day) is a better treatment for patients in sinus rhythm who have a reduced left ventricular ejection fraction (LVEF). We followed 2305 patients for up to 6 years (mean [±SD], 3.5±1.8). The primary outcome was the time to the first event in a composite end point of ischemic stroke, intracerebral hemorrhage, or death from any cause.

Results: The rates of the primary outcome were 7.47 events per 100 patient-years in the warfarin group and 7.93 in the aspirin group (hazard ratio with warfarin, 0.93; 95% confidence interval [CI], 0.79 to 1.10; P = 0.40). Thus, there was no significant overall difference between the two treatments. In a time-varying analysis, the hazard ratio changed over time, slightly favoring warfarin over aspirin by the fourth year of follow-up, but this finding was only marginally significant (P = 0.046). Warfarin, as compared with aspirin, was associated with a significant reduction in the rate of ischemic stroke throughout the follow-up period (0.72 events per 100 patient-years vs. 1.36 per 100 patient-years; hazard ratio, 0.52; 95% CI, 0.33 to 0.82; P = 0.005). The rate of major hemorrhage was 1.78 events per 100 patient-years in the warfarin group as compared with 0.87 in the aspirin group (P<0.001). The rates of intracerebral and intracranial hemorrhage did not differ significantly between the two treatment

groups (0.27 events per 100 patient-years with warfarin and 0.22 with aspirin, P = 0.82).

Conclusions: Among patients with reduced LVEF who were in sinus rhythm, there was no significant overall difference in the primary outcome between treatment with warfarin and treatment with aspirin. A reduced risk of ischemic stroke with warfarin was offset by an increased risk of major hemorrhage. The choice between warfarin and aspirin should be individualized.

Stem Cell Therapy for Post Infarction Repair: Where Are We?

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Modern revascularization treatment for acute ST elevation myocardial infarction (STEMI) with either thrombolytic agents or primary PCI has dramatically reduced hospital mortality, yet surviving patients are more prone to develop heart failure secondary to chronic left ventricular (LV) remodeling. In order to counteract this evolution the first attempts of cellular therapy in patients with STEMI were initiated in 2000 by injecting autologous mononuclear bone marrow cells into the target coronary artery. A recent meta-analysis of 1765 patients from 33 randomized trials, treated with autologous bone marrow derived stem cells have shown only a modest improvement in LV ejection fraction of ± 3-5% which was however maintained over a prolonged period of time (12-61 months) and without effects on morbidity and mortality. A number of parameters have been identified which did influence these results: i.e. degree of baseline LV function, the absolute number of cells injected, methods of cell preparation, degree of retention of injected cells in the myocardium as well as decreased function of the bone marrow cells in some patients due to the presence of additional risk factors. In order to circumvent the potentially defective bone marrow cells, the use of allogeneic mesenchymal cells would have the advantage of functional standardization and validation as well as on the bench availability. These cells do not however differentiate into cardiac or vascular cells but most probably act through paracrine secretion of growth factors as well as cyto-protective factors. Recent trials where intracoronary infusion of cardiac stem cells or cardiosphere-derived cells, harvested from the left atrium or right ventricular biopsies have yielded some positive effects suggesting a regenerative benefit. Currently true myocardial cell regeneration is only possible with the use of embryonic pluripotent cells. This approach faces two major challenges, first the risk of tumor degeneration and second the allogeneic character of the cells with the risk of rejection. Another research avenue is the use of adult pluripotent cells which are reprogrammed to a pseudo embryonic state before being re-differentiated towards cardiac cells. This approach will avoid the ethical issues of the use of embryos but will face a potential for genetic alteration due to the reprogramming process. It is not inconceivable that in the end stem cells are acting through exclusively paracrine mechanisms.

Carotid Disease Management, Update 2012

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Advances in management of carotid stenosis have been occurring to the extent that complications are far fewer than ever before. Complications like death, major stroke are now less than 3-4% in complicated patients. Minor complications are fewer too. Options of revascularization are getting better and now we can customize revascularization procedure based on disease morphology and carotid artery anatomy. Talk will cover above issues and show you what to expect in future.

Evidence Based Medicine: Statin: Weighing the Evidences

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Statins have been quite useful treatment to optimize various lipid parameters and reduce cardiovascular events and mortality in various groups of patients. There has been sizable data in many patient populations however data is not robust in certain other patient population. Though some clinicians are extremely optimistic about abilities of this class of drug to minimize effects of cardiovascular epidemics, more so in countries like India, daring to state that 'statin should be mixed with municipality water tank', in real world, still many patients who need this drug remain without it suffering from very serious consequences of CAD.

Debate about safety of statin has been as old as statin it self! Since 1987, thourough follow up of various trials, registries and clinical experience of many clinicians, it is quite evident that statins are generally well tolerated and believed to have minimal adverse effects which are amenable to monitoring and most are reversible. Uncommonly individual specific adverse effects like significant elevations of liver enzymes, muscle pain – body aches and very rarely rhabdomyolysis have been reported. In majority of above causes temporary discontinuation or reduction in dose of statin is all what is required to resolute these adverse effects.
Recently, debate has been generated focusing on possible negative long – term effects of statin treatment on cognitive function, the incidence of cancer and the development of diabetes mellitus. Recently, the U.S.FDA has expanded the warning for statins with a statement that statin use may lead to cognitive impairment. But on the other hand few reviews published in various reputed journals have negated this and concluded no excess risk of cognitive decline with statin. Similarly, few good retrospective reviews and meta analyses have concluded about safety of statin as far as risk of cancer is concerned.

However, statin use has been found to be associated with a small increased risk of type 2 diabetes mellitus. In view of the overwhelming benefit of statins in the reduction of cardiovascular events, most clinicians believe

that the small absolute risk for development of diabetes is outweighed by the cardiovascular benefits in patients for whom statin therapy is recommended, particularly when statin is used for secondary prevention.

Opinion is quite divided for use of statin for primary prevention, especially when absolute risk of CV event is less. Here the trade is prevention of approximately 4 cardiovascular events per 200 patients treated with giving 2 people new diabetes. Many questions remain and some are partially answered: What are the mechanisms? Is it specific to an agent? Has it a relation with dose and duration of treatment? Does it cause diabetes to some pre specified sub groups only like those with high BMI or those with high FBS? Does this new onset diabetes has similar consequences like if diabetes has been pre-existing? Attempts to answer all these questions will surely lead us to prescribe statin in safer way for primary prevention. At the stage over prescription of statin, particularly off label use for primary prevention of low risk patients should be avoided. And all those who receive statin should be followed for new onset of diabetes.

Evidence Based Management: Cardiogenic Shock

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Cardiogenic Shock (CS) is a clinical syndrome manifested by a sudden reduction in myocardial contractility and cardiac output, leading to systemic hypotension and end-organ hypoperfusion. The incidence of CS is common as a consequence of predominant LV infarction (80%) and RV infarction (3-5%). CS develops with pertubations of left ventricular diastolic and systolic function resulting in reduced tissue perfusion. Main causes of CS are acute myocardial regurgitation, right ventricle infarction, left ventricular failure, cardiac rupture, ventricular septal rupture, primary valvular disorders and primary myocardial disorders. Clinical features of CS are shock with systolic BP<90, myocardial re-infarction, recurrent ischemia, mechanical complications and infarct expansion.

CS can be diagnosed by decreased cardiac output and evidence of tissue hypoperfusion in presence of marked and persistent (> 30 min) hypotension with a systolic BP < 90 mmHg; reduction in the cardiac index (<2.2 L/min/M2), and normal or elevated PCWP (> 15 mmHg). Right heart catheterization is a diagnostic method which checks elevated LV diastolic filling pressure (pulmonary capillary occlusion pressure), diminished cardiac output and index, elevated systemic vascular resistance, pulmonary congestion and high levels of nitric oxide (NO).

Pulmonary artery catheterization findings provide clues to mechanical complications of MI that lead to CS and are useful in patients who remain hypotensive despite fluid challenge, or in those hypotensive in whom fluid administration is contraindicated. Echocardiography is useful in determining the degree of LV dysfunction, evaluation of suspected mechanical complications of AMI causing CS, rupture of the papillary muscle of the mitral valve and rupture of the interventricular septum. It also confirms or excludes the presence of fluid in the pericardial space if ventricular free wall rupture is suspected. LVEF and the severity of mitral insufficiency are

predictors of 1-year survival in patients with moderate to severe mitral insufficiency.

Administration of antiplatelet and antithrombotic agents and vasopressors including dopamine and norepinephrine is main pharmacological therapy for CS patients. Prompt endotracheal intubation and mechanical ventilation and infusion of sodium bicarbonate is main supportive treatment for CS patients. Mechanical circulatory support is given to CS patients by use of intra-aortic balloon pump (IABP) counterpulsation, which augments central aortic pressure in diastole, increases coronary perfusion and reduces afterload and decreases myocardial oxygen demand. Based on clinical trial findings, IABP support reduces afterload, increases myocardial oxygen supply and augments diastolic perfusion pressure. It is associated with a decrease in CS patient mortality and is easy to use with fewer complications. However, IABP support does not reduce 30-day mortality; CS patients complicating myocardial infarction undergoing early revascularization.

Other ways to provide mechanical circulatory support include newer ventricular assist devices (VADs), percutaneous VAD (pVAD) and an alternative pVAD -IMPELLA device. LVAD unloads LV pressure and volume with enhanced remodeling capability and decreases wall tension with improved endocardial blood flow. TandemHeart pVAD system is useful in reducing myocardial oxygen demand. Impella device is excellent in preventing shock. Access site and ischemic limb complications with less improved outcomes are more common with use of these devices than with IABP.

Based on ACC/AHA recommendations PCI is recommended for patients with acute MI who develop cardiogenic shock with other suitable conditions. A hemodynamic support device is recommended for patients with cardiogenic shock after STEMI who do not quickly stabilize with pharmacological therapy.

Pulmonary Embolism – Prevention and Treatment

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Despite many medical advances, acute pulmonary embolism (PE) remains a cardiovascular emergency with high morbidity and mortality. With clinically suspected PE, rapid and targeted treatment is essential because speedy diagnosis and immediate therapy can lower the morbidity and mortality associated with PE. However, the non-specific clinical presentation and the variety of suggested diagnostic algorithms, some of which are complex, can impede speedy and certain diagnosis. A pulmonary artery embolism is defined as a partial or complete occlusion of a pulmonary arterial branch. Approximately 70% of cases are caused by pelvic or leg thromboses. Awareness of the risk factors is essential if individualized and risk-adapted prophylaxis is to be implemented. In clinical practice, however, PE also occurs in about 20% of cases in patients without recognizable risk factors.

With acute PE, there is a mechanical obstruction of the pulmonary circulation system. The hemodynamic consequences are determined by the size of the embolism, any pre-existing cardiopulmonary diseases, and the

intensity of pulmonary vasoconstriction. With hemodynamically significant PE, the sudden increase in pulmonary arterial pressure can cause acute right ventricular dysfunction and lead to the interventricular septum deviating to the left with a fall in the left ventricular preload. There is a danger of a subsequent reduction in coronary perfusion and cardiac output with cardiogenic shock and myocardial ischemia. Suspicion of acute PE is raised by symptoms such as sudden onset dyspnea and tachypnea, chest pain, hemoptysis or syncope but these symptoms are neither sensitive nor specific due to the variety of possible differential diagnoses. Additional examinations such as chest x-rays, ECG or blood gas analysis are also unsuitable to confirm or exclude suspected PE with sufficient certainty but they do help with differential diagnosis.

Apart from hemodynamic stabilization and reversal of hypoxemia, the therapeutic goals for acute PE are—depending on the severity—prevention of appositional thrombus growth, restoration of pulmonary blood flow, and prevention of recurrences. If there is no contraindication, parental anticoagulation is therefore obligatory. The options available include unfractionated heparin (UFH), low-molecular-weight heparin (LMWH). Where suspicion of an acute PE is high (high or intermediate clinical probability), initial anticoagulation—with consideration of the bleeding risk—must be initiated before a definitive diagnosis is available. Hemodynamically unstable patients with confirmed PE require immediate thrombolysis to relieve the right ventricle. The following active substances and dosage regimens are recommended.

Streptokinase*	250,000 U as a loading dose over 30 min, followed by 100,000 U per hour over 12–24 h
	Accelerated regimen: 1.5 million IU over 2 h†
Urokinase*‡	4,400 U per kilogramme of body weight as a loading dose over 10 min, followed by 4,400 U/kg/h over 12–24 h
	Accelerated regimen: 3 million U over 2 h†
Alteplase*	100 mg over 2 h§
	Accelerated regimen: 0.6 mg/kg over 15 min
Reteplase*¶	Two bolus injections of 10 U 30 min apart
Tenecteplase∫	30 to 50 mg bolus over 5–10 sec adjusted for body weight:
	<60 kg: 30 mg ≥60 to <70 kg: 35 mg ≥70 to <80 kg: 40 mg ≥80 to <90 kg: 45 mg ≥90 kg: 50 mg

Invasive treatment (percutaneous and surgical intervention) are usually reserved for the patients with failure to respond with medical treatment and could be life saving in patients with massive pulmonary embolism. Prevention is, however, the best treatment.

Myocardial Infarction in Pregnancy- A Different Entity

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Pregnancy associated AMI is different than AMI in non-pregnant patients in several important aspects that need to be taken in to account in the management of women with this condition. Atherosclerotic CAD, the most common cause of AMI in the non-pregnant population is responsible for only a 1/3 of cases with PAMI while the majority of cases develop their AMI by other mechanisms. The location of AMI in pregnancy is commonly the anterior wall and is therefore associated with a high incidence of LV dysfunction, congestive heart failure, cardiogenic shock and mortality. Because many of women with PAMI have CD or normal coronary anatomy the risk of thrombolytic therapy may outweigh the benefit and blinded use of such therapy is not advisable. High incidence of iatrogenic coronary dissection secondary to intracoronary contrast injection and mechanical interventions suggest that invasive approach to PAMI should be limited to high-risk patients. In such patients mechanical manipulations should be limited to a minimum. The use of guidelines recommended anti platelet therapy seems indicted for maternal protection, at the same time however women should be informed on the paucity of information available on the safety of these drugs for their foetus.

New Strategies for Management of Hypertension

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Arterial hypertension prevalence is common around the world and it is a major cause of cardiovascular morbidity and mortality. Timely diagnosis and adequate treatment are of essential importance and improve the life expectancy. A persistent systolic blood pressure (SBP) of 140-159 mmHg or diastolic (DBP) of 90-99 mmHg is classified as stage 1 hypertension and stage 2 for SBP $\geqslant$ 160 or DBP $\geqslant$ 100 mmHg. Prehypertension (120-139/ 80-89 mmHg) warrants lifestyle modification. Secondary causes of hypertension, such as renal artery stenosis, Cushing syndrome and pheochromocytoma are prevalent in 5-10% of the patients and should be excluded. Thiazide diuretics are recommended as initial therapy for uncomplicated hypertension, either alone or in combination with other agents. The basic BP target for hypertensive patients is <140/ <90 mmHg and <130 / <80 mmHg for patients with diabetes and/ or renal disease as co-morbidity. Frequently, despite treatment, the BP is suboptimally controlled and exploration of alternative treatment modalities remains essential. Evidence suggests that hyper-activation of the sympathetic nervous system (SNS) plays a major role in initiating and maintaining hypertension. Hypertensive patients have higher levels of catecholamines and associated increased renal, cardiac and skeletal muscle SNS activity. In the BP regulating system, the kidneys play a crucial role through efferent and afferent neural pathways. Efferent renal SNS regulate the BP directly via the kidney through promoting tubular salt and water retention and indirectly through the renin-angiotensin system mediating

vasoconstriction and sodium and water retention. Afferent renal nerve traffic affects the central sympathetic nervous activity. To reduce renal sympathetic afferent and efferent activity, a percutaneous, catheter-based approach directly targeting the renal sympathetic nerves by applying endovascular radiofrequency energy in the renal arteries has been developed. This therapy has been studied in a series of studies and further studies are ongoing. In the Symplicity HTN-2 study, 106 patients with resistant hypertension, defined as SBP ⩾160 mmHg (or ⩾ 150 mmHg in patients with type 2 diabetes) despite the use of ⩾ 3 antihypertensive medications, were randomly assigned to undergo renal denervation with the Symplicity device or to continue treatment with antihypertensive medications alone. At 6 mo follow-up, in the denervation group, office BP had significantly decreased by a mean of –32/ –12 mmHg versus baseline, while there was no change (mean 1/ 0 mmHg) in the control group. A decrease in systolic BP of ⩾10 mmHg was observed in 84% of the patients who underwent renal denervation. Only a few procedural side effects were reported and no adverse effects on renal function during extended follow-up. Renal denervation extends the treatment options for patients with treatment resistant hypertension.

Role of Physiological Assessment of Lesion Severity in Patients with Multi Vessel Disease

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There has been a paradigm shift from anatomical to functional evaluation of lesion severity in patients undergoing PCI. In patients with 1 vessel disease it is usual easy to determine the causal relation between angiographic obstruction and ischemic symptoms. In contrast, in MVD it is more difficult to determine the causal relation between an angiographic stenosis and flow limiting stenosis due to the limitations of coronary angiography as well as myocardial perfusion imaging. Fractional Flow Reserve (FFR) measurement has been shown to be superior in sensitivity and specificity compared to angiography and even myocardial perfusion imaging in differentiating flow-limiting from non- flow-limiting lesions. Data from the FAME trial showed that out of 1414 lesions (509 patients) classified as significant on the basis of the angiogram only 61 % proved to have a FFR ratio < 0.8. The FAME trial was initiated to answer the question whether PCI guided by FFR measurement (cut-off value: 0.80) was better than angiographic guided PCI. Routine measurements of FFR during PCI significantly reduced the rate of the primary composite endpoint of death, myocardial infarction and repeat revascularization at 1 year (18.3% versus 13.2%) and at the same time reduced the number of stents used (2.7±1.2 versus 1.9±1.3) while resulting in a similar if not improved functional result. The FAME I and II trials provide strong evidence that coronary angiography and clinical data alone are not sufficient for decision making about the appropr iateness of revascularization of individual lesions in patients with MVD.

Antiplatelet Therapy in 2013: Acute Coronary Syndrome

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Early pharmacological treatment in patients presenting to emergency room with acute coronary syndrome (ACS) is crucial, lessening the impact on both morbidity and mortality, with the centre of management being antiplatelet agents. Obviously aspirin and clopidogrel have been the drugs of choice for nearly a decade or more, an array of newer, more potent and effective antiplatelet agents are now available and few will become available in near future. Definite data has been emerging suggesting these agents have superior anti Ischemic properties leading to improved short and intermediate term outcomes. At the same time some agents do have higher bleeding risks and vigilance as well as proper patient selection is necessary to have net clinical benefit.

Though use of clopidogrel has been a great advance in the treatment of ACS, it has some short falls.

1. It being a prodrug requires CYP2C19 dependent metabolism to get converted to active form. Ten – 15 % individuals have impaired metabolism making them 'non-'responders leading them to have up to 3 times increased risk of major cardiovascular events.
2. It has slow onset and slow offset of action, raising some serious issues when a patient needs urgent percutaneous intervention with stenting in ACS/STEMI or when a pre loaded patient has to have urgent/early surgical revascularization.

There is a need of novel, ideal antiplatelet agent that could overcome few of these limitations of clopidogrel in the management of ACS. The ideal oral antiplatelet agent would be rapidly absorbed, would achieve fast and thorough antiplatelet effects within few minutes, would have no inter-individual variation of effects, no or minimal drug-drug interaction and would be having rapidly reversible antiplatelet effects. In addition to being more effective and safer, it should be proven through randomized controlled trials.

A) Prasugrel:

A novel, irreversible P2Y12 ADP receptor antagonist, is orally active, rapidly effective (desired platelet inhibition achieved within 20-30 minutes of loading dose of 60 mg), more potent agent with less varied action. It is found superior to clopidogrel in moderate to high risk ACS patients undergoing PCI, (TRITON TIMI 38) to reduce primary composite end points of cardiovascular mortality, non fatal myocardial infarction or stroke. Based on bleeding risk, it is not to be used in patients who are more than 75 year of age, weigh less then 60kg or who has past history of stroke. It's offset of effects is also slow, making it necessary to stop it 7 days prior to CABG. Thus a significant number of patients are excluded from prasugrel therapy.

B) Ticagrelor:

A novel oral reversibly binding ADP P2Y12 receptor antagonist, with faster on set and offset of actions as compared to clopidogrel. It is not a pro drug and so does not depend on metabolic processes to achieve

effects. In PLATO trial 180 mg of loading followed by 90 mg twice day dosing was superior to clopidogrel in wide spectrum of patient with unstable angina, NSTEMI or STEMI (no h/o fibrinolytic wthin 24 hours) undergoing medical care or urgent / early revascularization in respect of composite primary end points of cardiovascular mortality, MI or stroke. There are few striking side effect like dyspnea, long ventricular pauses, increase in creatinine and uric acid levels without any serious consequences. Dose of aspirin should be less then 100 mg/day when this agent is used.

C) Cangrelor and Elinogrel are other agents under studies

Thus, new agents do show some improvement over and above clopidogrel but they do have some limitations understanding of which is vital to optimize outcomes of patients with ACS.

Diastolic Heart Failure

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A substantial number of patients with heart failure (HF) have preserved left ventricular ejection fraction (LVEF), variably defined as an LVEF >50%. The left ventricle in HF with preserved LVEF may be characterized by LV hypertrophy, concentric remodeling, increased extracellular matrix, abnormal calcium handling, abnormal relaxation and filling and decreased diastolic distensibility. Activation of the neurohormonal milieu, including the renin-angiotensin-aldosterone system (RAAS) and the sympathetic nervous system, is common in HF with and without preserved LVEF. In prospective studies, approximately 50% of the population of patients with HF has normal or near normal resting LVEF. HF with preserved LVEF is particularly prevalent among the elderly, females, and patients with hypertension. The mortality of patients with HF with preserved LVEF is considerable, and in the general population of unselected patients it may be comparable to mortality in patients with HF and reduced LVEF. HF with preserved LVEF is also associated with considerable morbidity. There is a 50% chance of re-hospitalization for HF in 6 months in patients with HF with preserved LVEF. Women make up a majority of patients with HF with preserved LVE, Most studies have shown no difference in survival by gender and the presence of coronary artery disease (CAD) has been shown to be an adverse factor for survival. New diagnostic procedures and potential therapeutic interventions have been proposed and will be discussed.

Guidelines for Treatment of Heart Failure

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Heart failure is a syndrome characterized by high mortality, frequent hospitalization, reduced quality of life, and a complex therapeutic regimen. Knowledge about HF is accumulating so rapidly that individual clinicians may be

unable to readily and adequately synthesize new information into effective strategies of care for patients with this syndrome. Trial data, though valuable, often do not give direction for individual patient management. These characteristics make HF an ideal candidate for practice guidelines. The 2010 Heart Failure Society of America comprehensive practice guideline addresses the full range of evaluation, care, and management of patients with HF.

Left ventricular (LV) remodeling and reduced ejection fraction (EF) should be distinguished from the syndrome of clinical heart failure (HF). When LVEF is reduced (<40%), but there are no signs and symptoms of HF, the condition frequently is referred to as asymptomatic LV dysfunction (ALVD). It is important to distinguish between ALVD and patients categorized as New York Heart Association (NYHA) Class I HF. Although patients with NYHA Class I HF do not currently have HF symptoms, they may have ALVD currently, or they may have clinical systolic HF with symptoms in the past. In contrast, patients with ALVD have no past history of HF symptoms. It is now well recognized that there may be a latency period when the LVEF is reduced before the development of symptomatic HF. Although most attention in the HF literature has centered on patients with symptoms, evidence now indicates that ALVD is more common than previously assumed. The recent realization that therapies aimed at symptomatic HF may improve outcomes in patients with ALVD has increased the importance of recognizing and treating patients with this condition.

Prevalence: The prevalence of systolic ALVD ranges from 6% to 16% in population-based studies.The prevalence of ALVD was 16.7% among a cohort of 1046 asymptomatic diabetic patients without known coronary artery disease. Some studies suggest that patients with ALVD equal or outnumber those with overt HF. The First National Health and Nutrition Examination Survey Epidemiologic Follow-up Study (NHANES I) reported only a 2% prevalence of overt HF in individuals ages 25 to 74 years, though this value likely is an underestimate. The prevalence of both ALVD and overt HF dramatically increase with age. The lifetime risk of developing HF is approximately 20% in octogenarians. In specific populations, such as those who have received cardiotoxic agents and those screened due to a family history of dilated cardiomyopathy, the incidence of ALVD is likely much higher.

Prognosis : Patients with ALVD have approximately half the mortality rate (5% annualized) of those with overt symptoms of HF, but their risk of death is 5 to 8 times higher than a normal age-matched population. In the Study of Left Ventricular Dysfunction (SOLVD) prevention study, patients with untreated ALVD developed overt HF at a 10% annual rate, with a further 8% annual risk of death or hospitalization for HF.These data indicate patients with ALVD are at high risk for developing HF. The majority of data regarding outcomes in patients with ALVD come from the SOLVD-prevention study; it would be valuable to have more recent data to fully understand the mortality risk of ALVD in the current era.

One trial that can be used to evaluate ALVD outcomes in the current era is the Occluded Artery Trial (OAT).The study enrolled 2216 subjects 3-28 days post-myocardial infarction (MI) with mean LVEF 48% (LVEF <40% in 21% of the study population). The large majority of subjects (83%) were asymptomatic. A high proportion of subjects

received multiple drug therapies including >80% treated with beta blockers, angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB), statins, and aspirin. Subjects were randomly assigned to a percutaneous coronary intervention (PCI) strategy to open the infarct-related artery or medical management. During a mean follow-up period of 1059 days, adverse cardiac event rates (all-cause mortality, non-fatal MI, and HF hospitalization) were much lower than that reported in the SOLVD study population (301 events with calculated crude event rate 4.8 per 100 patient-years). There were no significant differences in rates of adverse outcome events in the two treatment groups. Lower cardiac event rates in the OAT study population may be attributable to less severe systolic dysfunction and more widespread use of post-MI medical therapies.

Managing Patients With ALVD : The management of patients with ALVD focuses on cardiovascular risk factors and on preventing, controlling, or reducing progressive ventricular remodeling.

A number of risk factors have the potential to promote progression of ventricular remodeling and adverse outcomes in patients with ALVD. These include systemic hypertension, coronary artery disease, diabetes, obesity, and metabolic syndrome. Population-attributable risk for hypertension and MI may be as high as 60% to 70%, underscoring the importance of preventing and managing these two conditions. The 30% or more of patients with ALVD who do not have ischemic heart disease may suffer from hypertension, diabetes mellitus, alcohol overuse, or familial or idiopathic dilated cardiomyopathy. Surveillance studies suggest that relatives of those with idiopathic dilated cardiomyopathy often have asymptomatic LV dilatation and may be at increased risk for developing HF.In addition, those exposed to toxins through alcohol overuse, ionizing radiation, or chemotherapy with anthracyclines may develop ALVD, which may progress to HF in the absence of intervention.

Guidelines for Management of Non - STEMI/Acute Coronary Syndrome

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Acute coronary syndrome (ACS) refers to any group of symptoms attributed to obstruction of the coronary arteries mainly due to atherosclerotic plaque. Factors determining plaque vulnerability are location, size and thickness of plaque, and presence and activity of inflammation in the atherosclerotic lesion. Exertion, sexual activity, anger, mental stress, cocaine use, tobacco and air pollution are main triggers of acute plaque rupture. Main causes of ACS are Supply-demand inequity (type 2 myocardial infarction), coronary embolism and vasospasm and plaque erosion. History of certain signs and symptoms, patient examination, ECG readings and test of cardiac markers are suggestive of ACS secondary to coronary artery disease (CAD). Exercise ECG, exercise or pharmacological SPECT perfusion imaging, PET perfusion imaging, exercise for pharmacological stress echocardiography, magnetic resonance imaging, EBCT angiography, and MSCT angiography are main diagnostic tests for risk stratification of CAD. But they have their own strengths and limitations.

Selection of management strategy is based on clinical characteristics of patient. For example, invasive surgeries are used for patients with recurrent angina or ischemia at rest, elevated cardiac troponins and new ST segment

depression. Conservative surgery is used for patients with low risk score and in absence of high risk features. Oral antiplatelet therapy including aspirin, clopidogrel, pasugrel, thienopyridine GP IIb/IIIa inhibitors, and abciximab are used based on ACC/AHA 2007 guidelines for management of unstable angina or NSTEMI patients. Dosing of anti coagulant agents in UA/NSTEMI patients is different in initial medical therapy and thereafter. There are different recommendations for antiplatelet drugs including long term antiplatelet agents, and warfarin. In different disease conditions including diabetes mellitus and chronic kidney failure use of antiplatelet medicines differ.

Otamixaban, rivaroxaban, apixaban, REG1, M118, and dabigatran are few anticoagulant agents which are under investigation. Based on various case study results, ticagrelor is recommended for all patients who are at high risk for ischemic events and prasugrel is used for those diabetic patients who are proceeding to PCI. Clopidogrel is recommended for patients who cannot receive ticagrelor and prasugrel. Based on ESC NSTE-ACS guidelines, addition of a glycoprotein IIb/IIIa receptor inhibitor is recommended for high risk PCI patients who are already treated with DAPT if risk of bleeding is low. In summary, there are different recommendations of antiplatelet drug use in different patients for different disease conditions

Guidelines to Newer Pathways to Resistant Hypertension

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Hypertension is a single largest contributor to death worldwide and it increases risk of stroke, heart attack, heart failure and kidney failure. Resistant hypertension is defined a failure to achieve goal BP when a patient adheres to the maximum tolerated doses of 3 antihypertensive drugs including a diuretic. Renal nerve anatomy allows a catheter-based approach as a standard interventional technique for resistant hypertension. It will be considered as a new field of minimal invasive therapy.

Based on SYMPLICITY HTN-1 study data, right femoral artery (RFA) of renal sympathetic nervous system is useful in significant reduction in SBP and DBP. Based on SYMPLICITY HTN-2 study data catheter-based renal denervation (RD) is useful in significant reductions in BP without major complications. It is beneficial for patients with treatment-resistant essential hypertension.

RD might also be associated with substantial reductions in cardiovascular morbidity and mortality. It offers a novel approach to reduce blood pressure and rate of microalbuminuria in high-risk hypertensives with preserved renal function, without effects on glomerular filtration rate as measured by cystatin C or renal vasculature within 6 months.

Based on various studies on RD and insulin resistance, it has been proven that RD significantly reduces fasting glucose, insulin, C-Peptide, and 2-hour glucose, improves insulin sensitivity and reduces the rate of progression

to diabetes or glucose intolerance. It may represent the first non-pharmaceutical approach for treating insulin resistance.

Future treatment targets of RD are obstructive sleep apnea and chronic heart failure. It reduces systemic sympathetic activation, congestion (fluid overload) and CHF, induces LVH regression and ventricular remodeling and improves renal function and obstructive sleep apnea. It decreases arterial stiffness, reduces arrhythmias, hypertension, glucose tolerance and insulin resistance. Based on SYMPLICITY HF study future projections, RD will be an effective and safe therapy for mild hypertensive patients and will not be associated with clinically significant adverse events in HF patients.

Renal Artery Stenosis: Diagnosis and Management

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Renal artery stenting is perhaps the most widely applied and poorly tested from all revascularization techniques. Physiology of the renal circulation is equally poorly understood and assessed. The prevalence of atherosclerotic renal artery stenosis (RAS) varies from10-30% in patients with vascular disease. Randomized trials between balloon angioplasty and medical treatment have not proven to induce a beneficial effect on blood pressure. Similarities between the coronary and renal circulation are the auto-regulation to transient changes in driving pressures. But while the heart tries to maintain flow constant at the cost of pressure, the kidney tries to maintain pressure constant at the cost of flow. In addition to and in contrast with the coronary circulation, the renal circulation is also equipped with a systemic adaptive mechanism for long term pressure regulation. Generally accepted indices of RAS, derived from renal angiography and/or from color duplex ultrasound tend to overestimate the actual severity of RAS when compared with the transstenotic pressure gradient. In RAS, a resting Pd/Pa ratio larger than 0.90 can be considered hemodynamically not significant, and is unlikely that renal angioplasty would be useful in these patients even though percent diameter stenosis is larger than 50%. Conversely RAS with a Pd/Pa ratio < 0.90 should be considered hemodynamically significant regardless of their angiographic severity.

Varicose Veins : Diagnosis and Management

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Introduction: Recent innovations have revolutionized the management of varicose veins and chronic venous disorders (CVD). Despite widespread awareness programmes, thousands of patients are suffering from chronic venous ulcers and leg pains due to lack of basic referral system and guidance.

Methods: From 1st March, 2012 to 30th November, 2012, 300 patients with varicose veins, with female preponderance and mean age of 50 were evaluated at CIMS vascular unit. After initial clinical assessment they were classified according to basic 'CEAP' classification and evaluated with venous Doppler scan. 60 patients out of 300(20%) having clinical severity stage 2 symptomatic to stage 6 underwent treatment. Our protocol included RF ablation (Using VNUS closure fast) for GSV and SSV varicosities with S-F and S-P Junction in competency respectively. Below knee veins were managed using USG guided Foam sclerotherapy and/or Hook phlebectomies. Procedures were performed under “Day care surgeries” or single day admissions. Out of 60, 15 patients had venous ulcers, 5 patients had BIL varicosities and 3 patients had SSV varicosities. Post procedure protocol is early ambulation and grade II compressions stocking for 6 weeks.

Results: All patients were followed up at 1, 3 and 9 months. 1st follow up included Doppler scan. Follow up ranges from 1 month to 9 month. All patients made satisfactory recovery except 2 patients who had small skin necrosis due to foam extravasation and 1 patient who needed second cycle of sclerotherapy for residual veins.

Conclusion: Patient tailored strategies for varicose veins and venous ulcers using combination of RF ablation, Foam sclerosants and ambulatory phlebectomies gives safe and durable results. The patients with grade II and VI gets maximum satisfaction and improvement in quality of life.

Saving Limbs with an Endovascular Approach

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Revscularization of lower extremity for limb salvage has undergone revolutionary changes. Now we have understood the vascular supply of the limb, better than ever before. With this understanding we hope to salvage more limbs. Data is yet to prove the point, but small studies show good short term results. I will discuss various modalities used to revscularize and the decision making processes. I will share my results.

Surgical Approaches for Transcatheter Aortic Valve Implantation

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Senile, calcific aortic stenosis (AS) is the most common valvular abnormality in Europe . At 75 years of age 4.6% of the population have severe AS and by 85 years old this has risen to 8%. With an increasingly elderly population, this presents a major healthcare burden. Once symptoms develop, the 1-year and 5-year survival rates of un-operated patients are dramatically curtailed at 60% and 32% respectively. Symptomatic, severe AS is therefore a class I indication for a surgical aortic valve replacement (sAVR) and the efficacy of aortic valve replacement (AVR)

for symptomatic AS is well established. Despite this, a large proportion of this cohort remain untreated because of advanced age and multiple co-morbidities - some estimates suggest that up to 30-40% of elderly patients that would meet the criteria for surgery are never offered it. It is in these patients that transcatheter aortic valve implantation (TAVI) has seen its most marked growth since it was first demonstrated by Cribier et al. using a transvenous, trans septal approach. There have been encouraging results in the short and longer term registries and recently a randomized controlled trial demonstrated an absolute reduction of 20% in all-cause mortality compared to medical therapy in patients unsuitable for surgery.

Currently four devices are commercially available - the Edwards SAPIEN THV valve (Edwards Lifesciences, Irvine, CA), that can be implanted antegradely via the ventricular apex (TA) or retrogradely via the femoral artery (TF) and Trans-arotic approach (TAo), the CoreValve Revalving system (Medtronic, Minneapolis, MN), which is approved for use via the TF approach and also via the subclavian artery and TAo approach. Symetis Accurate valve and Jenavlave can be implanted only by TA approach.

The new frontier in TAVI is in improving the deliverability of the device and minimizing patient morbidity and mortality through device development and patient selection. In my talk I will describe the various surgical approaches and recent efforts to reduce the morbidity associated with them and possible advantages over non-surgical approaches.

Advances in heart valve design

Aim of this talk is to cover various advances in heart valves in terms of design which will enable us to reduce mortality, morbidity and also help easier implantability. I will cover advances in

1. Mechanical valves
2. Biological valves
3. Composite conduits
4. TAVI

Dyslipidemias: Current Management and Challenges Ahead

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Clinical and basic research over the past half century indicates that atherosclerotic cardiovascular disease is associated with several risk factors including dyslipidemia, metabolic syndrome/diabetes mellitus, hypertension, cigarette smoking and family history. An abundance of evidence indicates that lowering Low Density Lipoprotein-Cholesterol (LDL-C) results in reduction of cardiovascular (CV) events by approximately one-third. Two-thirds of patients continue to have events. This has been referred to as residual risk. It persists in spite of concurrent therapies for non-lipid modifiable risk factors. Addressing this residual risk when the LDL-C and other risk factors are mitigated is the biggest challenge in current therapy for reducing the burden of atherosclerotic CV disease, prime cause of death. Additional challenges include narrowing the gap between current knowledge and its application to populations at high CV risk. In addition to medical nutrition therapy, statins, ezetimibe and bile acid sequestrants alone or in combination effectively lower LDL-C in the vast majority of patients to target levels per the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) guidelines in the USA. These guidelines emphasize the need to lower LDL-C as guided by risk assessment.

In order to address residual risk, recent research has focused on low levels of High Density Lipoproteins (HDL), elevated Triglycerides (TG) as 2 additional targets of therapy after lowering LDL-C to the NCEP goals. Although available lipid regulating drugs affect several components of the lipid profile, fibrates and fish oil primarily lower TG whereas niacin is the most effective available agent for increasing HDL in addition to its effects on TG and LDL. Clinical trials to assess efficacy in yielding incremental benefit in CV event reduction more than with statin-based aggressive LDL-C lowering therapy have only recently been done. In the ACCORD and the AIM HIGH trials, the addition of fenofibrate or niacin, respectively to statin-based therapy did not yield incremental benefit on primary endpoints. Both these trials had significant limitations and the results apply to the patients studied and cannot be generalized.

However, very recent sub-group analysis of the AIM HIGH trial (AHA meeting, November, 2012) did show that patients treated with niacin and whose TG>200 mg/dl and HDL-C<32 mg/dl had significant CV event reduction compared to control patients. Additional research which is underway (HPS-2 THRIVE trial) and others trials in patients specifically with high TG and very low HDL-C, is needed to confirm and extend these results in other patient groups. These results may be particularly important in India where metabolic syndrome/diabetes mellitus and mixed dyslipidemia is at epidemic proportions.

Newer therapies for dyslipidemia are also underway. These include new formulations of niacin to prevent flushing, the PCSK9 antibody, very effective for LDL lowering in patients whose LDL-C cannot be brought to target, CETP inhibitors that effectively raise HDL-C, Apolipoprotein(apo) AI Milano, apo AI mimetics and other apo AI based agents which mediate functional properties of HDL.

10 Points to Remember on Management of Cardiovascular Disease During Pregnancy

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1. Most women with heart disease can become pregnant
2. The management of a pregnant patient with heart disease should ideally start before pregnancy
3. The diagnosis and management of heart disease in pregnancy should also take into account fetal safety
4. Drugs, including safe drugs, should be used in pregnancy only if absolutely indicated and in the smallest dose effective
5. A key for good outcome in women with severe heart disease is a close follow up
6. Normal physiological changes of pregnancy can either mimic or obscure signs and symptoms of CV disease
7. Women with Eisenmenger syndrome, Severe pulmonary arterial hypertension, severe LV dysfunction, Marfan with dilated aorta, valvular or CHD at NYHA class $\geqslant$III should not become pregnant.
8. Shortness of breath early after the delivery – think peripartum cardiomyopathy
9. Acute myocardial infarction in pregnancy predominantly due to coronary atherosclerotic disease during early part of pregnancy and coronary dissection during late pregnancy and early PP period.
10. Most women with heart disease can deliver vaginally

A 35 year Perspective of Coronary Artery Bypass Graft Surgery in India

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Coronary artery bypass graft surgery took nearly a decade to come to India following its introduction in the USA and Western countries. Even after its introduction in one or two centres in the country it took another decade to be done in significant numbers. It was only after the mid-eighties that significant numbers of these operations began to be done in Indian centres and interestingly this coincided with the introduction of percutaneous interventions in various Indian centres. The subsequent two decades saw rapid increases in the numbers of both procedures and though today like in Western countries the annual number of percutaneous interventions exceeds the number of CABG the interesting difference is that while there is gradual decrease in the numbers of CABG operations from year to year, we in India are registering a 15% annual growth in CABG in India. The main difference in this trend is because we are now facing an epidemic of coronary heart disease with an estimated 12-13% prevalence in our adult urban population and also because we are an under-served nation with facilities that can at present handle only a fraction of the population that needs to have these procedures.

There are distinct differences in the pattern of Coronary artery disease that we see in our country as compared to the disease patterns seen in Western countries. Our patients are younger, tend to have more diffuse disease,

tend to have myocardial infarction earlier in life, and appear to have disease that runs a more malignant and fatal course. We also have a higher proportion of diabetics, hypertensives and individuals with lipid abnormalities. All these, points to a lack of emphasis on primary prevention. In the early years we were all doing CABG using cardio-pulmonary bypass. In the late 1990s the beating heart technique was introduced and though at present less than 15% of CABG operations are done in Western countries by the Off-Pump technique, we are currently doing more than 60% of the 125,000 CABG operations every year by this technique. The shift to the Off-Pump technique has given a very big boost to CABG in India as proper application of this technique has reduced the morbidity of the operation and reduced the duration of ICU stay, blood usage and the incidence of respiratory, renal and neurological complications. Our own experience now covers 32,000 CABG operations, starting with an initial experience of 64 operations at the Railway Hospital, Chennai from 1976 to 1983 and followed by over 32,000 operations between 1984 to the present time at Apollo Hospital,Chennai. Of these more than 16,000 operations were done using the Off-Pump technique. The problems encountered in doing these operations and the impact of the increasing application of percutaneous interventions on CABG are outlined. The continuing reduction in hospital mortality to a less than 1% figure, the gradual shift to the increasing use of arterial grafts, and the noticeable improvement in long term results due to to emphasis on secondary prevention are discussed. In conclusion, the future of PCI and CABG in India based on current trends and WHO projections is projected.

Taking STEMI Patients to Percutaneous Coronary Intervention Hospitals Save Time, Life and Money

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Rapid gains have been made in the management of acute MI. These changes are occurring globally albeit at a varied pace in different regions of the world. The entire spectrum is shifting from thrombolytic therapy to pharmaco-invasive management and finally to Primary PCI. Scientifically, primary PCI is clearly superior to thrombolytic patients for most subsets, except for the very early presenting patient that may be a candidate for newer generation thrombolytic agents that are administered pre-hospital. Beyond this situation that poses logistical challenges of early and pre-hospital administration, in virtually all other cases, primary PCI is vastly superior. These benefits are even seen for patients that need to be transferred for primary PCI. However, primary PCI poses financial and logistic challenges that are challenging although not insurmountable. To be most effective, primary PCI should be performed very early in the course of the patients's presentation of chest pain. This is critical and this essential principal is the foundation for establishment of Door to Balloon time or D2B. There is some disagreement as to the optimal D2B time - in Europe this number has slide to 120 minutes whereas the United States has a more stringent D2B requirement of 90 minutes. To improve D2B times, it is important to make improvements in both the STEMI process and the procedure.

Dr. Mehta has pioneered improvements in both the STEMI process and the procedure. He has been a strong advocate of the use of Bivalirudin as a default anti-coagulant and a Class I b indication as per guidelines. Dr. Mehta's selective management of thrombus forms the cornerstone of the treatment of thrombus for STEMI lesions. Pragmatic methods to improve the STEMI process have also been promulgated in the SINCERE (Single Individual Community Experience Registry) database.

The lecture will also include STEMI networks and the development of population-based STEMI programs.

How to read Medical Journal Paper / Articles with Insight on Statistics? - A Must for Physicians

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We are living now in era of “DATA”. Information is flooded in just few clicks. Tremendous amount of medical literature is published every day. Adopting results of different medical trials is not only confusing but very difficult as results of studies are conflicting so many times. In this topic we will discuss simplified but systemic approach to read and understand medical scientific trial. I have labelled this approach as 'D Approach' as it contains all Ds namely demographics, disease type, disease severity, design and difference in outcomes; both statistical and clinical. Finally we will discuss step care algorithm which you can easily remember and adopt in your busy practice while come across any medical literature.

Radial Percutaneous Transluminal Angioplasty with Stenting of Celiac Artery and Abdominal Aorta in Ventilated Patient with Takayasu Arteritis and Severe Heart Failure

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Case Presentation:

A 49-year-old female patient known case of hypertensive encephalopathy, diabetes mellitus, congestive cardiac failure, ischemic heart disease, recurrent pulmonary edema, generalized wasting, and recurrent hospitalization presented with tachycardia, breathlessness since 10 days, and diminished peripheral pulses bilaterally was

admitted at Care Institute of Medical Sciences, Ahmedabad, India. Her baseline vitals were: blood pressure- 185/100 mmHg, heart rate- 92 beats/minute, respiratory rate- 30/minute. Her random blood sugar was 139 mg/dl and C-reactive protein level was 95.41 mg/L. Her echocardiographic evaluation showed LVEF 25%. CT Angiography and conventional angiography showed extensive changes of aorto-arteritis with multiple collaterals, 80% stenosis in abdominal aorta at origin of celiac trunk with 2.5 cm length complete block in infrarenal aorta just above bifurcation.

Diagnosis and Management:

She was diagnosed with presumable Takayasu Arteritis, severe cardiomyopathy,ostial right coronary artery stenosis and severe peripheral artery disease. Admission medications were aspirin, clopidogrel, atrovastatin, carvedilol, amlodipine, digoxin, prazosin, furosemide, metolazone, nitroglycerine, and nicorandil. Patient was on ventilator support due to resistant heart failure. In accordance with these findings, stenting of the celiac artery and abdominal aorta was planned. The technique involved an access with a 6-F shuttle sheath in the right radial artery. Multipurpose catheter was navigated into the abdominal aorta, where it was engaged serially in target vessels. Percutaneous transluminal angioplasty (PTA) with stenting was done of the celiac artery [Blue stent (6.0 mm X 12 mm; Cordis, Jhonson&Jhonson)] and abdominal aorta [Genesis stent (8.0 mm X 24 mm; Cordis, Jhonson&Jhonson)]. Her C-reactive protein level reduced up to 46.91mg/L. Pressure Control Ventilation (PCV) was removed and patient extubated.

Outcome:

Patient was discharged in a heamodynamically stable condition. At 6 months follow up , her LVEF improved from 25% (baseline) to 45% with improvement in both legs' peripheral pulses and gain in weight (muscular) with no further hospitalizations. CT Angiography, showed widely patent abdominal aorta and celiac stents. Her medications have been reduced.

Current Consensus – Role of Vitamin D in Pediatric Practice

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Vitamin D deficiency is a highly prevalent condition in our country. Patients referred to us represent only the tip of an iceberg of the actual prevalence. Vitamin D is a prohormone which is essential for the absorption of calcium from the gut, and its deficiency can lead to rickets in children and osteomalacia in adults. In infants or toddlers, Vitamin D deficiency can present with hypocalcemia leading to seizures or tetany. Vitamin D is also known to be associated with failure to thrive, chronic diarrhoea and recurrent respiratory tract infections. It is important to recognize that vitamin D is primarily made in the skin after exposure to ultraviolet radiation and only 10% is derived from dietary sources. The principal causes of Vitamin D deficiency are inadequate intake, maternal deficiency or inadequate synthesis.The diagnosis of rickets depends on presence of the clinical features

supported by radiological and laboratory parameters. Measurement of 25 hydroxy Vitamin D remains the best indicator of the Vitamin D levels.. All children should receive adequate amounts of Vitamin D as a part of recommended intake. Vitamin D therapy is necessary for infants and children who manifest clinical features of hypocalcemia as a result of vitamin D deficiency or rickets and when vitamin D levels are in the deficient range.

Nephrology Pearls : Interactive Case Discussion

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Abstract: Diseases of the kidney and urinary tract are significant causes of morbidity and mortality in childhood. However, over recent years increasing knowledge of etiopathogenesis, improvement in investigating techniques and advances in therapeutic approaches have made inroads into the impact these disorders have on children. This has, in part,been due to the development of pediatric nephrology as a major emerginng pediatric subspeciality and associated with this has been the expansion of tertiary care centre providing fascilities for high end renal care.

The responsibilities of the Pediatric Nephrologist in the critical care setting are multifaceted. Management of acute renal failure with or without renal replacement therapy,fluid and electrolyte abnormalities and hypertensive emergancies are some of the major clinical circumstances where pediatric nephrologist is involved in the care of children admitted to PICU. Prudent to say that multidicsiplinary care by specialist do make a difference in care of these complex cases and in majority it is rewarding.

Parenteral Nutrition in Neonates - Pros/Cons

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Total parenteral nutrition (TPN) is the intravenous infusion of all nutrients necessary for metabolic requirements and growth. Parenteral nutrition (PN) refers to the supplemental intravenous infusion of nutrients by peripheral or central vein. Extrauterine growth retardation is a major clinical problem in preterm infant; sick preterm infants admitted to NICU. This underlines the importance of nutritional interventions immediately after birth. However the limitations of enteral route of feeding makes intravenous route, ie parenteral nutrition an essential part of neonatal care in ICU. Various challenges need to be overcome. Aim of TPN is to avoid unbalanced/excessive substrate supply, follow strict asepsis during preparation and delivery and monitor clinically and metabolically requiring meticulous team work.

Management of PPHN - Where do we Stand with Current Modalities?

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PPHN-Persistent Pulmonary Hypertension of newborn is the terminology which alarms us to not to offer the parents a good prognosis-Is this indeed true? N0- Answer is no. Here we try to emphasis upon understanding of this disease in way that would at least help us to make prognosis better.

Persistent pulmonary hypertension of the newborn (PPHN) is defined as the failure of the normal circulatory transition that occurs after birth. It is a syndrome characterized by marked pulmonary hypertension that causes hypoxemia and right-to-left extra pulmonary shunting of blood. Persistent pulmonary hypertension of the newborn is most commonly associated with 1 of 3 underlying etiologies, as follows:

- Acute pulmonary vasoconstriction
- Hypoplasia of the pulmonary vascular bed
- Idiopathic pulmonary hypertension

Signs of PPHN :-Infants with PPHN are born with Apgar scores of 5 or less at 1 and 5 minutes.
a Cyanosis may be present at birth or progressively worsen within the first 12-24 hours
Later developments:-Within a few hours after birth `tachypnea`retractions`systolic murmur`mixed acidosis, hypoxemia, hypercapnia,CXR`mild to moderate cardiomegaly,`decreased pulmonary vasculaturePulmonary Vasculature.Pulmonary vascular bed of newborn is extremely sensitive to changes in O2and CO2.Pulmonary arteries appear thick walled and fail to relax normally when exposed to vasodilators.Capillaries begin to build protective muscle. (Remodeling).

Diagnosis

Hyperoxia Test: Place infant on 100% oxyhood for 10 minutes.`PaO2> 100 mmHg parenchymal lung disease`PaO2= 50-100 mmHg parenchymal lung disease or cardiovascular disease`PaO2< 50 mmHg fixed R-L shunt cyanotic congenital heart disease or PPHN Hyperoxia Test (cont.)fixed R-L shunt `need to get a preductal and postductal arterial blood gases with infant on 100% O2.

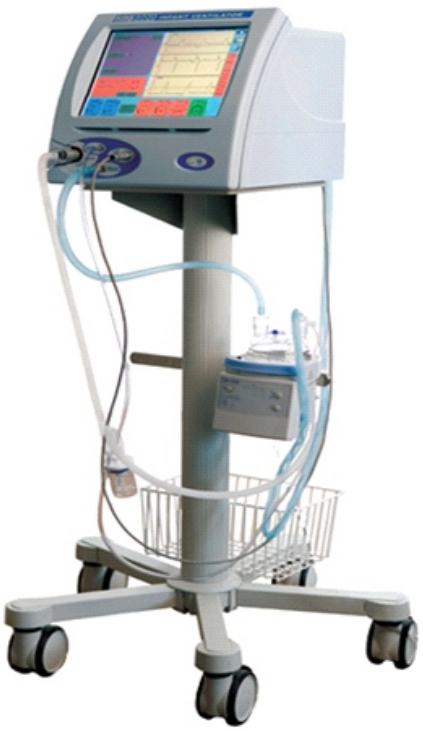
- Preductal- R radial
- Postductal- umbilical artery
  `If > 15 mmHg difference in PaO2 then ductal shunting
  `If < 15 mmHg difference in PaO2then no ductal shunting.
- Hyperoxia-Hyperventilation Test:-
  Hyperinflate baby with manual resuscitator and 100% O2until PaCO2reaches 20-25 mmHg.

`PaO2= 100 mmHg with hyperinflation

- PPHN-PaO2< 100 mmHg with hyperinflation
- R/O congenital heart disease with echocardiogram.

abnormal Echo = congenital heart disease

normal Echo = PPHN



Treatment

Goals:

`To maintain adequate oxygenation.

- These babies are extremely sensitive
- Handling them can cause a decrease in PaO2 and hypoxia
- Crying also causes a decrease in PaO2
- Try to coordinate care as much as possible

`To maintain neutral thermal environment to

Minimize oxygen consumption.

- Therapeutic Goals

Arterial blood gas values

- pH 7.45 - 7.55
- PaO2 50-100 torr
- PaCO2 25-40 torr

Systemic blood pressure

Upper limits of normal for size and post conceptual age

Adequate paralysis and sedation

- Ensure adequate oxygen carrying capacity. Maintain
- Hematocrit greater than 40% Medication
- May need to also give Dopamine or Dobutamine to maintain systemic blood
- pressure and to increase Cardiac output.Mechanical Ventilation
- TCPLV (Time cycled pressure limited ventilation) may be used with PPHN.
- Want to use low peak inspiratory pressures Monitor PaO2and PaCO2 with a transcutaneous monitor if possible.
- Hyperventilation

Hyperventilation helps promote pulmonary vasodilation Respiratory Alkalosis- decrease PAP to

Level below systemic pressures to improve oxygenation by helping to close the shunts

`Try to keep pH =7.5 and PaCO2= 25-30

`Alkalizing agents - sodium bicarbonate or THAM

Hyperventilation (cont.) Babies often become agitated when they

Are hyperventilated May need to administer muscle relaxants And sedation `usually given pancuronium and morphine

- Pancuronium- q 1-3 hours IV at 0.1-0.2 mg/kg
- Morphine- continuous infusion 10 micrograms/kg/hr or fentanyl @ 1-3 mcg/kg/min

HFOV

High frequency oscillatory ventilation

decrease risk of barotrauma, effective alveolar ventilation, alveolar recruitment

- HFOV more effective in PPHN babies with lung disease.

  Nitric Oxide (NO) Potent pulmonary vasodilator,decrease pulmonary artery pressure

  `Increase PaO2, Does not cause systemic hypotension,
- NO(Nitric oxide is- more effective in PPHN babies without lung disease

Baby must be weaned slowly off NO or may have rebound rise of Pulmonary pressures.Effects of NO.NO is metabolized to nitrogen dioxide (NO2) which can cause acute lung injury.

NO2is potentially toxic.NO reacts with hemoglobin to form methemoglobin.ECMO extra corporeal Membrane oxygenation Form of cardiorespiratory support that allows the lungs to rest so also called

Extracorporeal life support (ECLS). Outcome PPHN may last anywhere from a few days to several weeks. Mortality rate is 20-50%.`Decreased by HFOV and NO`Decreased by ECMO.Babies treated with hyperventilation may develop sensorineural hearing loss, Which is a serious consequence which shall not be missed , and timely BERA shall be done.

In Current scenario – there is an intense need to have set up with HFOV and if possible nitric oxide facility to save the newborns with this difficult subset and of course similar set up definitely helps in managing cases with congenital heart diseases especially after Cardiac surgery. Indigenously made solution for nitric oxide gas delivery system and making the system more cost friendly to the patients would make the care more viable in the setting like India. We at CIMS Hospital do support these kids with HFOV as well as nitric oxide therapy in settings of PPHN,MAS,Post cardiac surgery where PAH is the concern.

Neonatal Cardiac Surgery: How Timing of Surgery is Important

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With advancements in pediatric cardiac sciences increasing number of pathologies are being diagnosed prenatally and soon after birth. Neonatal cardiac operations are indicated for palliative as well as definitive treatment. Potentially life threatening pathologies like TGA with intact ventricular septum and obstructed TAPVC need neonatal complete correction, as the baby usually cannot survive to infancy. Likewise, neonates with truncus arteriosus have to be operated to treat severe cardiac failure and prevent irreversible damage to the lung vasculature. Neonatal large PDAs need prompt closure to treat systemic hypoperfusion and cardiac failure. Palliative operations like systemic-pulmonary shunt or PA band for complex diseases need to be done in neonates to allow growth and facilitate staged correction.

Timing of these surgical procedures in neonatal cardiac surgery is determined by the pathology, general condition of the baby, birth weight, associated comorbidities, need for preoperative inotropes and ventilation, availablility of appropriate infrastructure etc. Results are optimal if these interventions are timely. High index of suspicion and timely referral are important at the pediatrician level for the best outcomes in these critically ill babies.

Outcome after Pediatric Cardiac Surgery

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Advances in all branches of medicine; especially interventional cardiology, intensive care and anesthesia, perfusion and transfusion, have improved the early and late outcome in Pediatric Cardiac Surgery (P.C.S). This, coupled with skills and experience of a comprehensive team, has resulted in more than 95% immediate success rate in babies undergoing surgery for congenital heart disease. (C.H.D)

Low birth weight and age at time of surgery are no longer considered important risk factors for outcome. However delayed referral, irreversible changes in heart and lung, pre-operative ventilation and sepsis, and palliative (as compared to corrective) surgery continue to be important risk factors for negative early outcome. Late outcome in terms of survival, quality of life and exercise tolerance are also excellent in babies undergoing corrective surgery at appropriate age. Patients with single ventricle physiology, heterotaxy syndromes, use of conduits have however inferior outcome. A yearly echo in all patients undergoing pediatric cardiac surgery will detect new lesions and help nip the troubles in bud.

Neuro Emergencies in PICU

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The purpose of these talk is to discuss common neurological patients presenting to PICU from intensivists perspective. Outcome can be improved significantly if the patient is referred in time and managed well with goal of intact neurological survival.

Common neuro-emergencies in PICU are Seizures/Status epilepticus, Encephalitis or altered sensorium, Traumatic brain injury and electrolyte disturbances. Patient with seizures are sometimes referred very late after development of complications like hypoxic-ischaemic injury or rhabdomyolysis (needing hemodialysis) and poses a great challenge in management with high morbidity/mortality. Numerous trials have recently highlighted role of Levetiracetam in acute management in pediatric age group, either as first-line or add-on therapy.

Altered sensorium is always a diagnostic dilemma and need great teamwork with Pediatric Neurologists and radiology. One of the conundrums is whether to give Aciclovir or not? How to diagnose/confirm Herpes Encephalitis? When to intubate and ventilate?

Traumatic brain injury (TBI) poses significant clinical and logistic challenges in battle against time for patient to reach neurointensive care in time for intact survival. A great team effort is needed from Intensivist, Neurologist and Neurosurgeon to determine the best strategy for the patient. Particular emphasis from Pediatrician perspective needs to be laid on controlling and reducing ICP (Intracranial pressure) with preservation of CPP (Cerebral Perfusion Pressure). There is great interest in total body hypothermia in TBI with many trials ongoing in these field, particular in light of improved survival shown in newborns with HIE (Hypoxic-Ischaemic encephalopathy).

Neonatal Cholestasis: Journey from Approach to Transplant

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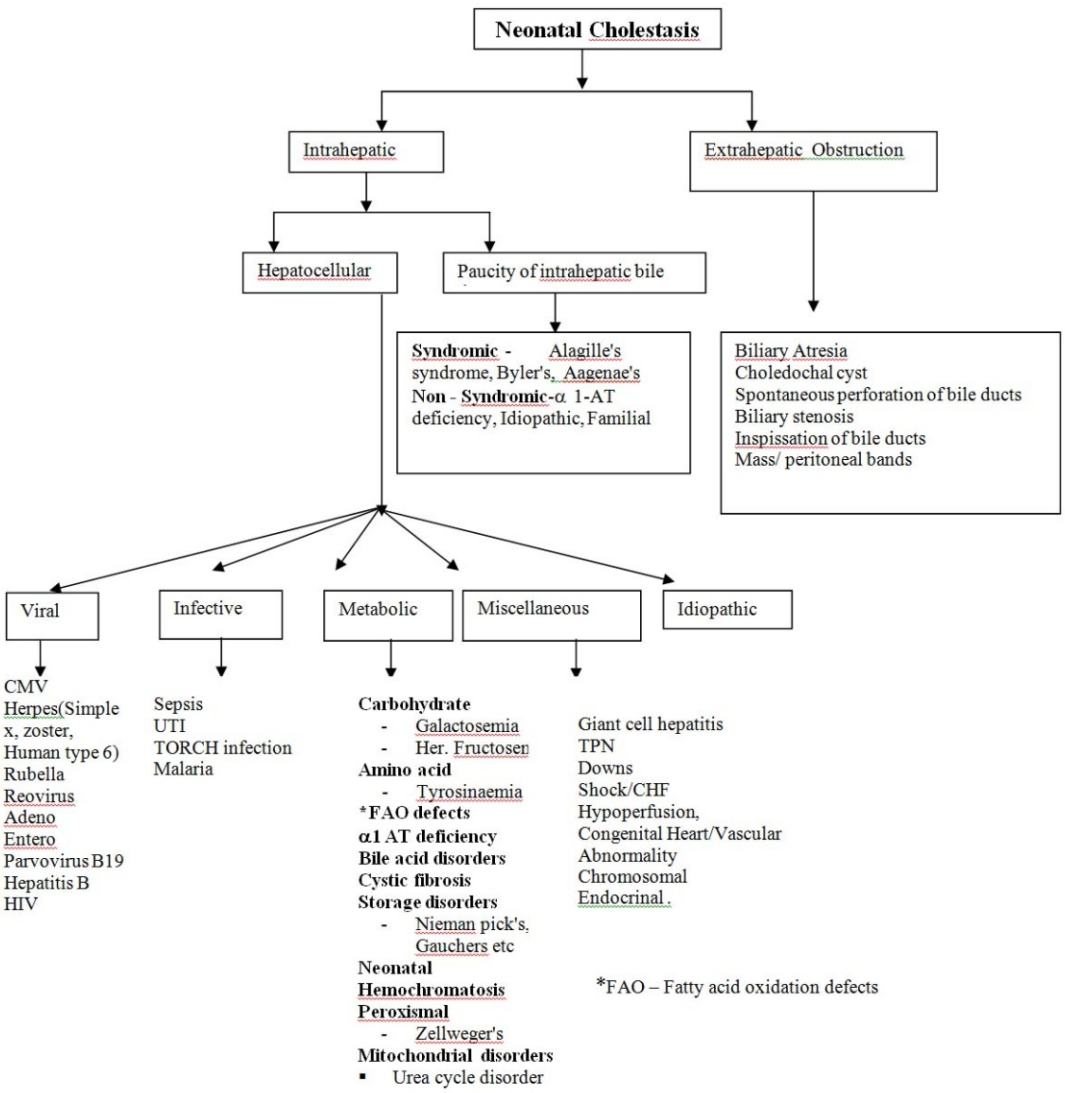
Definition

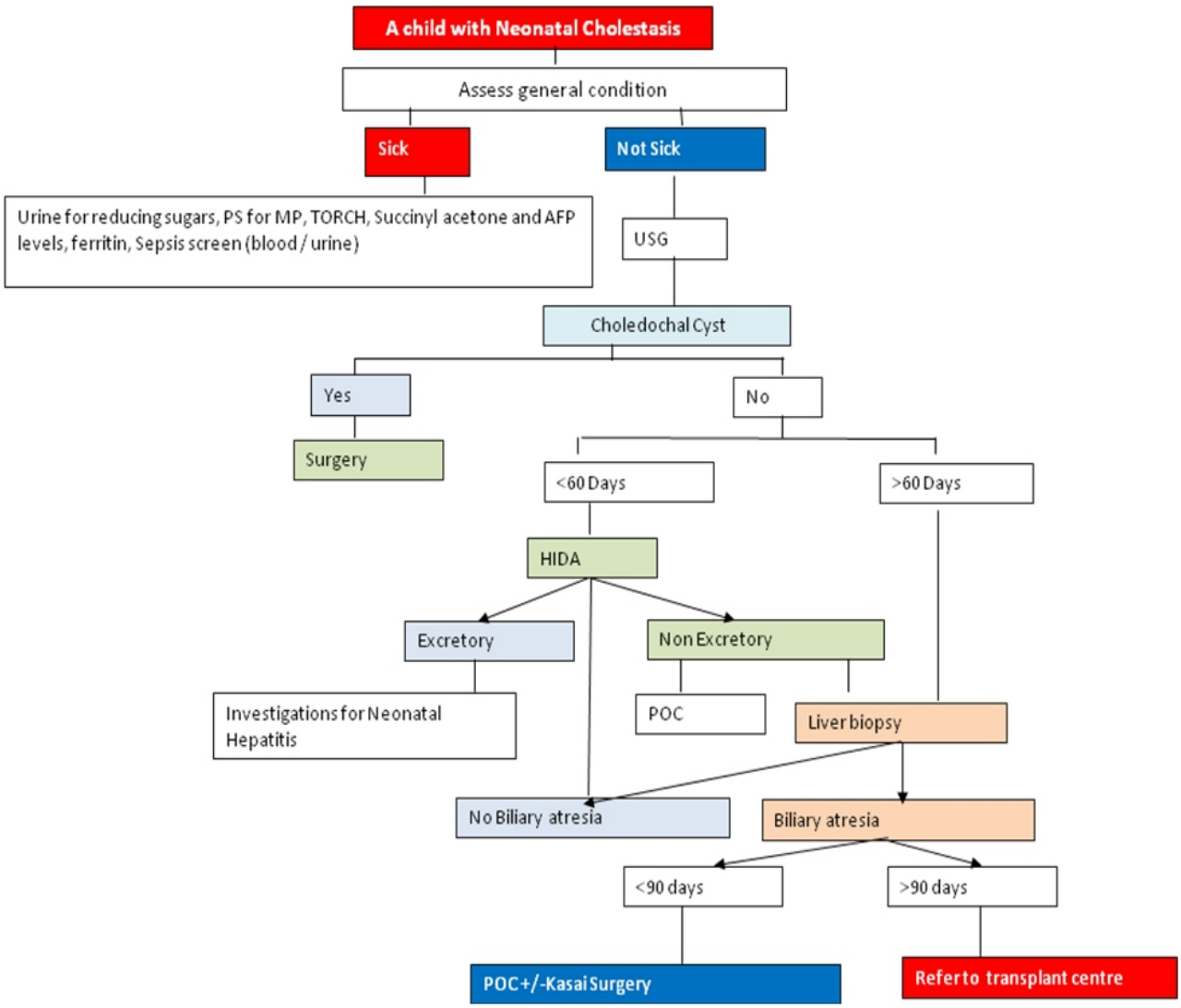
Neonatal cholestasis refers to conjugated hyperbilirubinemia > 1mg% when total S. Bilirubin is <5mg% or >20% of the total S. Bilirubin, if the total S. Bilirubin is >5mg% in a newborn/ infant, with passage of high coloured urine,with or without clay coloured stools.

Etiology

Neonatal Cholestasis results from intrahepatic and extrahepatic causes.



Approach to a case of neonatal cholestasis:



Role of liver transplantation:

Neonatal cholestasis is among the most common indications for pediatric liver transplants and with very good results. The 1 year survival is more than 90% and the 5 year survival rates are more than 80%. In our experience 50% of transplant were for cholestatic jaundice.

Our Experience

Total Pediatric Liver transplant	-	104
Mean age	-	72 months (5 mths-17yrs)
Mean weight	-	20.9Kg (4.8 - 66).
Less than 10 kgs	-	17

Indications for liver transplantation

- Chronic liver disease - 65 (64%)
- Acute & Acute on chronic liver failure - 33 (31%)
- Others - 6 (6%)

Chronic liver disease

Cholestatic liver disease: 52 Biliary Atresia40PFIC4Caroli's disease2 Alagille Syndrome2LCH3Choledochal cyst 1

Metabolic liver disease : 26

Wilson disease	13 (Acute on chronic liver disease -8)
Tyrosinemia	3
Autoimmune hepatitis	10

Others : 33

Acute and Acute on chronic liver disease	23
Cryptogenic	4
Primary Hyperoxaluria	2
Chronic hepatitis B	1
MSUD	2
Factor VII deficiency	1
Giant Cavernous hemangioma	1

Outcome

1 year survival rate was 93% with an overall survival of 89 % at mean follow up of 29 months (1 -85).

Encounter with Rare Pulmonary Disorder

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Pulmonary Alveolar Proteinosis (PAP) is a rare disease characterised by accumulation of surfactant protein in the alveoli impending the gas exchange. Idiopathic adult Pulmonary Alveolar Proteinosis is an autoimmune disorder characterized by circulating anti-GM-CSF (Granulocyte Macrophage Colony Stimulating Factor) antibodies and dysfunction in GM- CSF signalling, which results in an abnormal surfactant clearance from the alveoli. As Whole Lung Lavage may give symptomatic relief but not correct the underlying defect, by supplementing GM-CSF, progression of the disease can be curtailed. Hence GM-CSF therapy following Whole Lung Lavage is a promising

alternative in symptomatic patients of Pulmonary Alveolar Proteinosis requiring repeated Whole Lung Lavage. We present a case of a 58 year old female diagnosed with Pulmonary Alveolar Proteinosis on Video Assisted Thoracoscopic Lung Biopsy which was treated with Whole Lung Lavage. She presented with recurrence within 1 year, following which she required repeated bilateral whole lung lavage. She responded clinically & radiologically to subcutaneous injections of Granulocyte Macrophage Colony Stimulating Factor therapy (GM-CSF). Thus indicating that GM-CSF therapy is a promising alternative in those requiring repeated whole lung lavage.

Interpret HRCT thorax Simply

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This talks will emphasis on the basic technical factors of a good quality HRCT Thorax examination and interpretation of the HRCT findings of the common diseases found in clinical practice.

Immuno Nutrition: Still a Market Driven Area ?

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Nutrition is essential for all the patients in the ICU which decreases the morbidity and some studies show mortality decreased. Enteral nutrition is superior over TPN.

- Do the improvement in the immunological parameters will translate into a better clinical out comes ? Immune-modulating enteral formulations (supplemented with agents such as arginine, glutamine, nucleic acid, ω-3 fatty acids, and antioxidants) are used commonly. Nutritional support has always been an integral part of critical care but was conspicuously absent from the Surviving Sepsis Guidelines, probably omitted, because consistent studies reporting benefits in lowering mortality are lacking.
- Arginine - Normal arginine intake diet is between 5 and 7 g/d and endogenous production about 15–20 g.Requirement in critically ill patient is ?. Numerous studies using differing doses of arginine from 5 to 30 g/d. Meta analysis1 suggests that it decreases infection specially in the elective surgical patients. No difference in mortality and infection rate in critically ill patients.
- Glutamine - The endogenous production of glutamine as estimated is 40–80 g/24 h.

Dose required in the sick patient ? glutamine2 decreases hospital LOS and infectious complications in surgical patients. No difference in critically ill patients.

Recently published signet trail3 an RCT did not find any difference in the infectious complications and mortality in critically ill patients.

The OMEGA study4, a randomized, doubleblind study used omega-3 (n-3) fatty acids docosahexaenoic acid and eicosapentaenoic acid, along with _-linolenic acid and antioxidants.

Despite an 8-fold increase in plasma eicosapentaenoic acid levels, patients receiving the n-3 supplement had fewer ventilator-free days (14.0 vs 17.2; P=.02) (difference, −3.2 [95% CI, −5.8 to −0.7]) and intensive care unit–free days (14.0 vs 16.7; P=.04). Patients in the n-3 group also had fewer nonpulmonary organ failure–free days (12.3 vs 15.5; P=.02). Sixty-day hospital mortality was 26.6% in the n-3 group vs 16.3% in the control group (P=.054), and adjusted 60-day mortality was 25.1% and 17.6% in the n-3 and control groups, respectively (P=.11). Use of the n-3 supplement resulted in more days with diarrhea (29% vs 21%; P=.001).

Glutamine can be considered in trauma and burns patients.

Immunonutrition should be used in selected group of patients. Routine use is driven by the companies.

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Asymptomatic Sleep Apnea

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Most important symptom for obstructive sleep apnea (OSA) is daytime sleepiness and it is accepted as standard of care to offer a trial of therapy to improve sleepiness. Substantial portion of population with OSA are asymptomatic, i.e. without daytime sleepiness. In this population two issues are important; whom to screen for OSA and if they have OSA whether to treat or not. Irrespective of symptoms hypertension and endothelial

dysfunction are more prevalent in patients with OSA than in controls and as a result of that probably cardiovascular consequences are more common in patients with OSA. In this presentation we will discuss about whether therapy should be considered in asymptomatic OSA patients to improve future adverse clinical outcomes, especially with respect to preventing cardiovascular and cerebrovascular events.

Neuro-Critical Care - ICU Care in Patients with SAH

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Subarachnoid hemorrhage (SAH) is an acute cerebrovascular event which can have devastating effects on thecentral nervous system as well as a profound impact on several other organs. The course of the disease can be prolonged, with considerable secondary brain injury due to delayed cerebral ischemia (DCI). Systemic manifestations affecting cardiovascular, pulmonary, and renal function are common, and complicate the management of DCI. Due to the profound effects of the hemorrhage itself and the risk of early rebleedingand hydrocephalus, SAH patients are routinely admitted to an intensive care unit and are cared for by a multidisciplinary team including neurosurgeons,(neuro) intensivists, (neuro) anesthesiologists and interventional neuroradiologists.

Despite considerable effort, only one intervention—the use of nimodipine—for this complex multifaceted disorder has been proven to improve outcome in prospective ran-domized controlled trials [1]. This lack of high quality definitive data has led to numerous approaches to management and provides limited guidance on choosing among them.There have been relatively few guidelines developed for SAH management. They emphasize risk factors, prevention, natural history, and prevention of rebleeding, but provide limited discussion of the critical care issues involved in the care of SAH patients.

Aneurysm repair, and the detection and timelytreatment of DCI(Delayed Cerebral Ischaemia) are critical features of the care for SAH and are best accomplished at high volume centers (defined as >60 cases per year).The rate of transfer to high volume centers is too low given the complex nature of treatment that is required. Efforts to establish mechanisms to facilitate patient transfer and enhance the public awareness of the need for SAH patients to be treated at high volume centers are urgently needed.

This talk deals with the neurocritical care management of pt. following SAH in a comprehensive manner based on guidelines and recommandetions from neurocritical care society in 2011.

Delirium : The Lost World

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Delirium or acute confusional state is transient global disorder of cognition. The word "delirium" derived from Latin term meaning "off the track". It is common; life threatening and potentially preventable clinical syndrome among elderly persons hence should be treated as medical emergency.

It is one of the unresolved challenges to medicine. Prevalence of delirium at hospital admission ranges from 14-24 %, during hospitalization incidence ranges up to 5-60 % varies among medical and surgical patients. Mortality among hospitalized patient with delirium ranges from 22 – 76 % as high as with acute myocardial infarction or sepsis.

Causes of delirium are multifactorial, as development of delirium involves complex relationship between vulnerable patient (typical pt-elderly, bed ridden, male with h/o of depression- on antipsychotic drug, with co-existing medical illness) and exposure to precipitating factor –e.g.surgery, sleep deprivation, sedative-narcotic addition or alcohol withdrawal. Pathophysiology of delirium is poorly understood, though most evidence supports the role of neurotransmitters- cholinergic deficiency and dopaminergic excess, while less evident role of other neurotransmitters and cytokines.

Diagnosis of this syndrome remains bedside with clinical components of acute fluctuating course, inattention, disorganized thinking and altered conscious level. There are 2 types: hyperactive delirium, hypoactive delirium. Hypoactive type is more common, it tend to be overlooked and has worse prognosis among two types. Prevention of delirium is necessary for reducing its frequency and complications.

Key steps in management of delirium are to address evident causes, provide supportive care (managing ABC, hydration-nutrition etc.) and preventing complications. Non-pharmacological approach (with avoidance of restraints possibly) should be instituted in every patient. Pharmacological management should be reserved for patient whose symptoms would threaten their own or others safety, or would interrupt essential therapies. The long-standing traditional view is that delirium and dementia-chronic confusional state- are two separate conditions; however emerging evidence suggests their overlapping, delirium may herald the onset of dementia. Delirium, being one of the most preventable adverse event among older persons during hospitalization, meets the criteria for an indicator of the quality health care. The condition is integrally linked to process of care. Every effort should be made to prevent, detect and correct delirium at earliest, as it is associated with increased health care costs, long term functional decline and high mortality.

Physician Heal Thyself: How to Take Care of Mental Health Issues

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Most doctors agree that we as physicians are not the model patients. Overall literature suggests that doctors maintain their general health well. When it comes to emotional wellbeing though it is a different story. Gruel training, long working hours at rapid pace while making life and death decisions, competitive environment and little time for personal and family wellbeing leads to higher rates of depression, substance abuse, suicide, burnout and impairment. We as doctors try to protect a fellow doctor and build an attitude and environment that creates stigma and risk of failure if one reveals his or hers mental issues. Recent literature suggests that positive programs like physician's wellness and resiliency development can help. We will discuss the 'BASICS' principle of resiliency so that audience can apply those principles in their real life.

Work up of Headaches Leading Towards Intervention

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Headache is the most frequent neurological chief complaint. It is important to get a proper headache workup to ensure proper treatment. During diagnostic workup, accurate history taking still is the mainstay for identification of patients with a serious underlying disorder. Secondary headaches are a symptom of an injury or an underlying illness. A number of characteristics make it more likely that the headache is due to potentially dangerous secondary causes; some of these may be life-threatening or cause long-term damage. A number of such "red flag" symptoms therefore mean that a headache warrants further investigations like headache that develops within minutes or associated with fever, stiff neck, change in behavior, vomiting, weakness or change in sensation. Testing of various types like CT scan, MRI, Electro-encephalogram (EEG), cerebral angiogram, PET scan, Lumbar puncture manometry are helpful in leading to proper intervention required for treatment of headache.

How to Read a Complete Blood Count Report?

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Complete blood count (CBC) is most commonly ordered and most underutilized blood test. Over 90% of cases of anemia including thalassemia minor, iron deficiency, B12 deficiency and most common febrile illnesses can be diagnosed by appropriate reading and interpretation of blood reports. In addition, leukemia, hematological malignancies like myelofibrosis, chronic myeloproliferative disorder and myelodysplastic syndrome can be picked up much before they clinically become obvious. Detection of mild thrombocytopenia as well as high platelet count on CBC can lead to diagnosis of treatable conditions like B12 deficiency, chronic liver disease, alcoholism, etc. Appropriate reading and interpretation of CBC reports with rselevant clinical example will be discussed in interactive format. In addition, importance of histogram and pitfalls of automated cell counter will be briefly discussed.

Recurrent Anemia may be due to Occult Blood Loss

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Anemia is defined as decreased in in number of red blood cells or less than normal quantity of haemoglobin. There are types of anemia namely haemorrhagic, haemolytic,or haemopoietic. Normally to1.5 ml. Of blood escapes in stool. Detection of occult blood detects blood loss in G. I. Tract. There are different methods used for detection of occult blood in stool. There are many different sources of g.i.bleeding and many different methods to investigate the source and treat.

STEMI Case Presentation

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This paper discusses case of a patient with complain of chest pain and history of myocardial infarction treated with cardiac medicines. A 70 year-old man, in Ahmedabad complained of severe chest pain that he had for few hours. After calling 108, he was taken by ambulance to the hospital which had no onsite cardiac program. On the

way, he provided the emergency medical technicians (EMTs) with personal information including 5'10" height, type 2 diabetes, 70 kg weight and history of prior myocardial infarction (MI), asthma and dyspnoea. His blood pressure was 132/78 mm Hg and heart rate was 74 beats/min. He was taking metformin 1000 mg, ramipril 5 mg, atorvastatin 20 mg, and aspirin 75 mg once daily. He was using an inhaler to control his asthma. However, he had not taken any medications on that day because of "feeling sick to his stomach."

Based on the given patient history the following questions will be discussed:

1. What would be the best choice to manage this patient?
2. Which would be the most appropriate diagnostic test for this patient arriving in the primary hospital?
3. What additional antiplatelet therapy, if any, would be preferred for this patient?
4. If selecting a glycoprotein (GP) IIb/IIIa inhibitor for this patient, which would be the best choice and when should it be administered?
5. Which access route would be preferred for this patient?
6. This patient's coronary angiogram shows thrombotic occlusion of the mid left anterior descending artery (LAD), nonobstructive disease in the circumflex artery, and a normal right coronary artery. Would thrombus aspiration be used in this case?
7. Which stent would be used for this patient during PCI, drug-eluting stents (DES) or bare metal stents (BMS)?
8. Which antiplatelet therapy (in addition to aspirin) would be used for this patient at the time of discharge?

Based on 2008 ACC/AHA STEMI/NSTEMI Performance Measures, there are different guidelines for prescribing aspirin on arrival, aspirin prescribed at discharge, beta blocker prescribed at discharge, statin prescribed at discharge, adult smoking cessation and cardiac rehabilitation patient referral from an inpatient setting.

Heart Failure and Diabetes: Management Considerations

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Heart failure and Diabetes mellitus are chronic complex medical conditions that are closely related and commonly coexist. Treatment options have varied over the years, but newer treatment modalities have developed which have improved prognosis and longevity of patients with these conditions. Unfortunately, despite these advances, the evidence base remains insufficient, and larger randomized control trials need to be conducted. Here I will discuss the available evidence and treatment and management of these inter-related conditions.

Hiatus Hernia Masquerading as Left Atrial Mass

Monika Maheshwari

Case History:

A 82-year-old man presented in the emergency department with complains of sudden onset of chest pain radiating to the epigastrium associated with vomiting and cold sweats since 2 hours. He was nonhypertensive, nondiabetic with no significant past medical history.

Diagnosis:

On examination his pulse was 70/minute (regular), blood pressure was 100/70 mmHg and respiratory rate was 28/minute. Jugular venous pressure was not raised and cardiovascular examination revealed no additional abnormality. Routine laboratory investigations including blood biochemistry, liver and renal function test with serum cardiac markers were within normal limits. The chest report revealed cardiomegaly. The 12-lead electrocardiogram demonstrated normal sinus rhythm with no evidence of ischaemia. A two-dimensional transthoracic echocardiogram revealed an amorphous, echolucent mass with the appearance of a left atrial space-occupying lesion (Figure-1). Left ventricular contraction was normal without asynergy. The patient subsequently underwent a chest computed tomography scan which confirmed the mass in the stomach with presence of a large hiatus hernia in the posterior mediastinum (Figure-2).

Management and Final Outcome:

The patient was immediately referred to the gastroenterologist where he was treated aggressively with proton pump inhibitors. Patient remained asymptomatic thereafter, during follow-up and laparoscopic fundoplication was deferred in view of absence of complications.

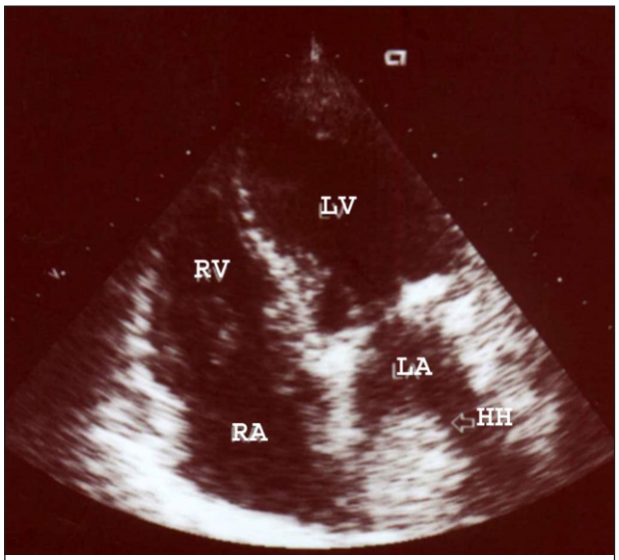

Figure -1: Transthoracic echocardiogram (apical 4 chamber view) with a left atrial space-occupying lesion

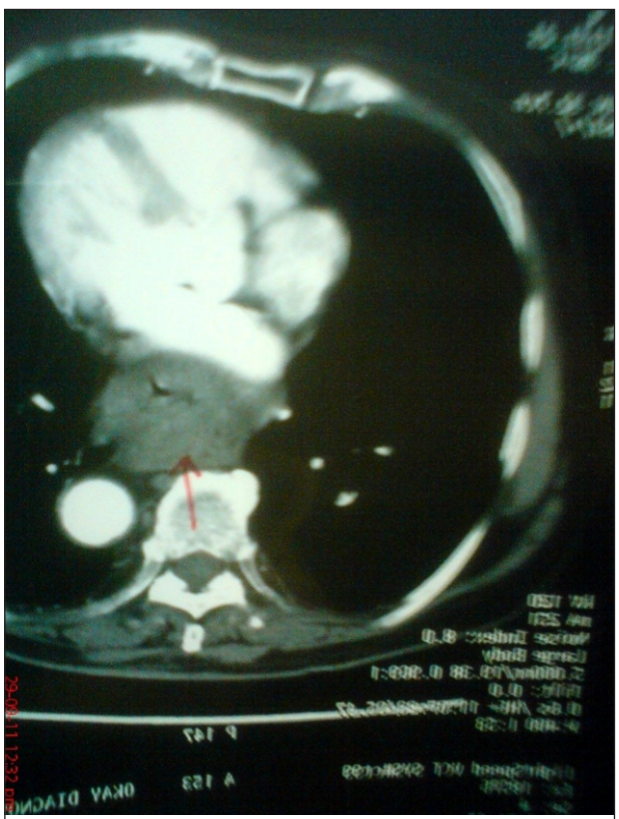

Figure -2: Chest computed tomography scan showing presence of a large hiatus hernia in the posterior mediastinum

Discussion:

Features that may help to distinguish between a hiatus hernia and an atrial mass on two–dimensional echocardiography are that the echo density of a hiatal hernia will extend beyond the margins of the atria. With angulation of the transducer the mass will not be confined to one atrium because hernia is a posterior structure separate from the heart. Besides this respiratory fluctuation in the degree of encroachment of the mass on the left atrium due to motion of the hiatal hernia along with the diaphragm during the respiratory cycle helps in identification. Further the visualization of swirling echodensities following oral ingestion of carbonated beverage particularly in combination with echocardiographic contrast media further enhances the differential diagnosis.

So, hiatus hernia can be presented as acute chest pain, while its echocardiographic manifestation may resemble a left atrial space occupying structure. Physicians should be aware of the characteristic echocardiographic findings to facilitate the differential diagnosis from similarly presenting cardiac entities.

Hyper Acute Inferior Wall Myocardial Infarction

B. J. Singh

Case History: A 65 year old male with symptoms of hyperacute inferior wall myocardial infarction, got admitted in ICU. His ECG, Trop I and 2 d echocardiogram were normal one day earlier. He had complains of atypical deep epigastric pain, post cibal mimicking doudenal ulcer, and pancreatitis. The patient was asked for ECG being doctor himself to varify any changes. Surprisingly he observed hyperacute inferior wall myocardial infarction. He was on ecosprin and clopidogrel and requested to be knocked down with Inj Emset followed by Inj morphine 1 mg. After conversation with his cardiologist friend, he decided to go for PAMI based on his condition.

Diagnosis: Right femoral approach angiography was performed which showed total block in mid and proximal RCA and two blocks in proximal and middle LAD.

Management and Outcome: Culprit vessel was tackled and 3 bare metal stents were placed in RCA with gratifying results. The patient improved with full recovery. There was no RWMA thereafter. The patient still had class I angina ever after PAMI. He was planned for PTCA after 3 months. All cardiac markers were well within normal limits with initial high blood sugar, and TG levels. LPA, Homocysteine, B12, Folate, D3, HSCRP and HbA1C were within normal range. Strict aggressive medical management and therapeutic life style management was conducted with cardiac nutrition, yoga and meditation. The PAMI was successfully done within 1-1/2 hr window period and conventional aggressive medical management for PAMI was followed. GPIIb/IIIa agents, aspirin, clopidogrel, and heparin were used conventionally. Nikoran was used for a short time. The hypotension was tackled with volume challenge. Insulin was used for stress diabetes mellitus.

Discussion: Clinical diagnosis was missed/not established even 1 day prior to episode. Patient was a sportsman at district level with large artery size. Stents used in the procedure were of 4- 4.5 mm size. Trop I may be negative in UA a day before attack. 2 D echo may be normal and misleading in UA. Patient had a bad family history presenting IHD and DM in parents and two brothers.

CVJ Anamoly with Atlanto-Axial Dislocation rarely Presenting as Posterior Circulation Stroke

Sandeep Borse (3rd yr Medicine Resident)
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Case History: A 15 year old male patient presented with sudden onset of decrease in vision, and giddiness since 2 days .His Hb was 10.7 gm/dl, total WBC count was 10,600, PCV was 32.8, platelet count was 6,15,000, Venous LACTATE was 2.9mmol/l, LIPID PROFILE was NADS ,creatinine was 0.7mg/dl and ESR was 30 mm.

MRI brain was suggestive of acute infarct in bilateral occipital temporal lobes, spenium and left thalamus, congenital CVJ anamoly with occipitalisation of C1. There was an atlantoaxial dislocation with postero superior displaced dense causing mild compression of cord without signal changes.

MR Angio of head and neck was suggestive of non visualization of flow in left PCA beyond P2 segment probably embolic occlusion. There was a focal narrowing in distal cortical branch of right PCA. Rest of circulation appeared unremarkable.

2D Echo was suggestive of normal echodoppler study. There was no thrombus or source of embolus. Patient was given the 5 day course of low molecular heparin considering it as embolic occlusion. After few days patient's vision improved. After 15 days patient again developed giddiness, difficulty in walking and loss of balance.

CT brain was suggestive of left cerebellar infarct and old infarct in B/L occipital lobe. MR Angiography was suggestive of acute hemorrhagic infarct of left cerebellar hemisphere and focal dilatation of left vertebral artery at the level of foramen magnum.

Based on MSCT of cervical spine for dynamic study findings, Partial atlanto occipital assimilation with basilar invagination as described above caused cervicomedullary junction compression. Spina bifida occulta was found at C5 level with posterior atlas arch rachichisis.

Treatment: The main treatment for this patient was Inj. Lasix and Inj Mannitol for 5 days. Patient was advised neurosurgery for correction of anamoly.

Conclusion: In conclusion we found a rare presentation of CVJ anamoly with atlanto-axial dislocation with posterior circulation stroke in this patient.

Challenging Case of Multiple Diseases

Abhishek Gupta

Case History:

A 30 year old middle aged labourer came to a private practitioner with history of diffuse gradually progressive dull aching headache, insidiously developing, mild to moderate in intensity a/w photophobia, not relieved by analgesics. He did not have previous history of any chronic disease. There was also h/o dizziness and difficulty in walking with swaying to left side frequent episodes of falls. Patient was advised MRI Brain.

Diagnosis:

After doing MRI (SEP 2008) it was being reported that there was an ill-defined area noted over B/L cerebellar hemisphere (R>L) and vermis displaying T1W hypo intensity and T2W/FLAIR hyper intensity with minimal diffuse restriction and heterogeneous patchy enhancement - Infiltrating Glioma. The mass effect was distorting lower mid brain and pons with compression over 4th ventricle roof. There was 7mm tonsillar herniation. There was mild dilatation of ventricular system suggestive of obstructing hydrocephalus.

Thereafter he was been advised to go for Electroencephalography and reports of this EEC were suggestive of 8-11 Hz and 13-28 µV alpha waves showing posterior dominance, while with closed eyes the graph was smooth and outline was clearly defined. Detailed study of montages revealed abnormality. Flow of theta and delta waves were also present. Eye opening, photic stimulation and hyperventilation produced abnormality apart from cerebral dysarrhythmias (Abnormal EEG record-cerebral dysarrhythmias).

Hence after MRI reports he was been advised to consult neurosurgeon for resection of Glioma. After the surgery, resection of lesion was resolved. Patient was labeled as having lesions of probable Infective/Inflammatory nature. Again he was diagnosed as suffering from demylinating lesion.

In August 2011 patient again became symptomatic and went to hospital. This time the patient had an episode of generalized tonic clonic seizure preceded by slurring of speech and headache since two days. There was no history of seizures in last one year. Repeat MRI was done on 16th August 2011.

According to MRI (Aug 2011) report, ring enhancing lesion with perilesional edema was seen in right frontal region. Ring was incomplete which favored a diagnosis of demyelination, nodular enhancing lesion with perilesional edema seen in right frontal region. ILL defined lesions suggestive of edematous change seen in left perisylvian region, left frontal region, and ventricular region. Basal cisterns appeared normal.

In August 2012 patient again reached at hospital with complain of headache. This time the headache was of

sudden onset, initially over right frontal area and later on generalized, moderate to severe in intensity. There was dull aching a/w nausea, vomiting, blurring of vision, nasal blocking discharge, redness of eyes, and slurring of speech. Patient underwent a NCCT Head Hyper-density with CT no of Blood (2.3x2.3x2.5 cm) with surrounding edema in right temporo-parietal region. He continued with complaint of severe headache. Further investigations were suggested. There was a lesion in right temporo-parietal area which was hypointense on T1W image and hyperintense on T2W images with surrounding edema. On CEMR ring like enhancement was seen in superior aspect of lesion. Another small round area of enhancement with surrounding edema was seen in right frontal region (abutting frontal horn of lateral ventricle). Ventricles, brain stem and cerebellum were normal. These areas showed blooming on T2W/FFE image suggestive of acute hematoma.

Management and Final Outcome:

Due to tonic-clonic seizure the patient was prescribed anticonvulsant & decongestant. On basis of all findings and clinical features patient was diagnosed of ADEM and kept on oral steroids. He again lost follow up and upon telephonic contact he was asymptomatic with no fresh seizure episode and headache. He was advised for tissue diagnosis which he repeatedly denied.

Challenging Case

Pradip Joshi

Case History:

A 48 year old lady presented with chief complains of lethargy, fatigue, occasional odd behavior, myalgia, irritability, edema, weight gain, occasional headache and vomiting since 6 months. The patient was on ayurvedic powder for joint pain. Patient was having past history of hypertension since 2 years and was taking tab Cilacar 10 mg OD. She was admitted 3 times in last year with altered sensorium and drowsy state. She had history of flaccid quadruparesis once and was admitted for that. She did not have history of diabetes mellitus, surgery or head injury.

She was admitted with complains of altered sensorium ,fever, headache, and bodyache on Feb 2009. Her lab reports showed 10.6 Hb, 18,700 TC, 80/18/01/01 DC, and 4,55,000 platelets. Neutrophil count showed toxic granules. Na+ was106 mmol/L and K+ was 1.7 mmol/L. She had UTI with Nil sugar /albumin. USG abdomen and chest X-ray were normal. ECG was suggestive of typical changes of hypokalemia. On 18th Feb 2009, the lab reports showed 115 Na+, 1.8 K+, 60 (98-106) CL-, 11,900 TC and 83/15/01/01 DC.

Diagnosis:

On examination it was found that the patient was suffering from Gitelman's Syndrome a rare Autosomal disorder. Gitelman syndrome is a rare inherited defect in the distal convoluted tubule of the kidneys. It causes

kidneys to pass sodium, magnesium, chloride, and potassium in the urine, rather than allowing it to be reabsorbed in the bloodstream. Gitelman syndrome should not be confused with Bartter Syndrome, which is a rare inherited defect in the thick ascending limb of the loop of Henle.

Management and Final Outcome:

No pharmacological treatment was given and the patient was treated with salt, potklor, digene, and calcium.

Clinical Case of Diabetes

Ankur L Raval

Case History: A 43 year young female presented to family doctor with complains of fever, abdominal pain, and vomiting of one day duration. Her temperature was 100 ^{o} F, pulse was 120/min, BP was 90/60 mmHg, and RR was 24/min. She had severe tachycardia, respiratory tachypnea without specific tenderness. The family doctor ordered WIDAL, SGPT, CBS and urine test. He started treatment with 10 % dextrose with MVI, intravenous Pantoprazole, intravonous Anset and intravenous Buscopan.

Her lab reports revealed 10 g/dL Hb, 11000 TC, NEG MP, 23 SGPT and 1:80 WIDAL. Patient's condition deteriorated and shifted to institute. She was semiconscious with altered sensorium. Her temperature was 99 ^{o} F, pulse was 140/minute, RR was 30/min, and BP was 80/60 mmHg. She had symptoms of tachypnea and tachycardia without specific tenderness. The catheter urine was suggestive of 50 pus cells/hpf, 4+ urine sugar, +++ acetone and 456 RBS. She was admitted in ICU for DKA with UTI. Her serum acetone & electrolytes were ordered. She was treated with ACT-RAPID normal saline, IV Levoflox, and Pantoprazole. She started improving soon. She was shifted to step-down unit next day. Her relatives asked for early discharge. She was given treatment of glycomet gp1 1/lunch, Pioglit MF 1/dinner, Levoflox 500mg/lunch, and Pantoprazole 40mg/day. She was given advice of FBS and PP2BS @5days. She came back on second day with h/o abdominal pain and vomiting with 378 RBS, 4+ urine sugar, and + acetone. She was treated with saline, insulin, and supportive. She was again discharged on request. At the time of discharge she was on mixtard 12units subcutaneously twice in a day with levoflox. She stopped insulin on her own and started ayurvedic treatment.

The very next day she was again admitted for DKA. She was kept for two days for comprehensive work-up. Her HbA1C was 9.8, urine micro was 17, creatinine was 0.9, Fundoscopy was normal and ECG was WNL. Her C - peptide level was negligible.

Case Discussion : A 43 year old female was first time detected for diabetes. She was thin and lean with no family history of diabetes. She had recurrent diabetic ketosis and required insulin injection. She was not much responsive to oral drugs. Her C-peptide was negligible. Her final diagnosis was late autoimmune diabetes in adult. Adult diabetic patients behave like type1 diabetic patients with recurrent diabetic ketosis which does not respond to oral hypoglycemic agents. Insulin therapy must be given to them as primary treatment.

Klinefelter's Syndrome – A Basket of Systemic Disorders

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Introduction: Klinefelter's syndrome (KS) is the most common genetic form of male hypogonadism with prevalence rate 1-2/1000 male newborns. In India more than 90% cases remain undiagnosed. KS commonly presents as infertility with azoospermia to gynaecologists. Gamete donation is advised without proper investigations. The final diagnosis and associated conditions remain untreated life long.

Objective: Aim of present study is to raise the awareness of clinicians about the complete work up for hypogonadism and chromosomal anomaly which may be a major trigger in background while treating the systemic disorders with history of male infertility.

Case History: In 2006, a 23 year old male presented for treatment of primary infertility with history of poor libido, scanty beard growth, learning disability, and poor academic performance. On examination, he had poorly developed secondary sexual characters with eunuchoid habitus, grade 2 Sexual Maturity Rating (SMR), and small (firm, peanut size and volume 2.5 ml) testes. Patient's vertical height was 185 cm, arm span was 192 cm and body mass index was 25. Semen analysis was suggestive of scanty semen volume of 0.5 ml with azoospermia. Hormonal analysis suggested 68 miu/ml FSH and 46 ng/dl Testosterone. Karyotyping was 47 (xxy), which confirmed diagnosis of KS. He was advised life long Testosterone Replacement Therapy (TRT) and gamete donation. He turned up after 6 years as secondary infertility with discontinued TRT, and abnormal development of truncal obesity (weight was increased from 84 kg to 112 kg and BMI was 33), gynaecomastia and chronic leg ulcer, which didn't heal even after receiving laser ablation and sclerotherapy. His current FSH was 88 miu/ml, Testosterone was 32 ng/dl, and haemoglobin was 12.2 gm%. He had hypertension with concentric LVH. Other serum biochemistry was normal.

Conclusion: In this case in absence of TRT the patient developed severe hypogonadism, syndromic obesity, chronic leg ulcer, and early cardiovascular and haemopoeitic disorder. This low immune status person in future will need constant surveillance for autoimmune disorders, breast cancer, various malignancies like lymphoma, leukemia, metabolic and degenerative diseases specially hypothyroidism, diabetes, osteoporosis, and early andropause. In such patient TRT in addition to the specific conventional treatment may be a promising approach.

Keywords: Azoospermia, Syndromic Obesity, SMR, TRT

Treating Fever with High Counts without Antibiotics

Prafulla Thakkar

Case History:

A 26 year old female who had been operated for brain surgery on 09/05/12 presented on 30/05/12 with fever (100-103 ^{o}F) since last three days with rash on face, mild itching, and + bodyache. She did not have complain of headache, vomiting, burning micturition and bleeding from any site.

Past History:

There was no history of major medical illness. She was on tab Augmentin and Eptoin for seven days after operation. And then she stopped all medications by herself.

On examination maculopapulars rash was found on face and scattered rash on hand & trunk. Her pulse was 108/min and BP was 110/80 mmHg. Her systemic examination was normal. There were no meningeal signs. Her Hb was 10.0 gm%, TC was 4200, Neutrophil was 63.9, Leucocytes was 19.2, Monocytes was 11.8, and Eiosinophil was 4.3. Her platelet count was normal and PCT (procalcitonin) was <0.5ng/ml. Her blood culture was sent from three sites. TFT and CXR were normal. MRI brain did not show any signs of meningeal enhancement. She was advised temperature recording and if temperature is > 100 ^{o} F, PCM was prescribed. She was prescribed Tab Allegra.

On next day she came back with complain of fever with spikes of 103 ^{o} F. Considering viral fever as blood investigations were normal, only PCM was continued and she was asked to come on next day. Patient presented directly after 5 days on 06/06/12 with complain of high grade fever 103 ^{o} F since two days. She had submandibular and cervical lymphadenopathy rash all over body. She was very fatigued and unable to walk.

On examination her pulse was 110/min, BP was 110/70mmHg and systemic examination was normal. Tonsillitis and maculopapular rash was present all over body. TC was 21000, Neutrophil was 32.3, Lymphocyte was 41.7, Monocyte was 21.5 and Eosionophil was 3.7 with normal platelet count. Urine was normal. Patient was admitted in the hospital. Blood culture was sent to the laboratory. Peripheral smear was advised. PCT was below 0.5ng/ml. Blood culture from three sites and throat swab was sent to laboratory. Serum WIDAL was negative. Injection Augmentin was started empirically.

After two doses of Augmentin patient complained of generalized oedema, facial puffiness, and inability to swallow. There was no stridor. Her TC was 33500, Neutrophil was 20.9, Lymphocyte was 56.0, Monocyte was

22.0, and Eosinophil was 0.8, LFT SGPT 286, and SGOT 379 with normal bilirubin. PCT was below 0.5ng/ml. Dermatologist opinion was taken to rule out early SJ.

Diagnosis:

She was found to be suffering from IM/ Eptoin toxicity based on lab investigations (Monocytosis with Atypical lymphocytes) and clinical features (cervical lymphadenopthy rash). Patient had taken Eptoin from 9th May to 6th May and then she had stopped it on her own.

Treatment:

Considering IM/Eptoin toxicity all drugs were stopped including antibiotics as high leukocyte count was not present because of bacterial infection. Injection Hydrocort 100 mg TDS with Allegra was started. Patient became afebrile after starting steroids. Patient showed symptomatic improvement. She was discharged after two days with short course of steroids 0n 09/06/12. Patients reports after four days on 13/06/12 was suggestive of 7100 TC, 61.8 neutrophil, L was 22.1 leukocytes, 6.8 monocytes and 4.3 eosinophils.

Conclusion:

Antibiotics should not be started immediately on seeing high count. When serial PCT is negative, the physician should wait and search for other causes of fever. Looking into differential count is very important.

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