Predict LoS (length of stay) of patients admitted for AMI (Acute Myocardial Infarction) and factors attributes it.

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Introduction:

Acute myocardial infraction (AMI) is the medical name for a heart attack. A heart attack is a life-threatening condition that occurs when blood flow to the heart is abruptly cut off, causing tissue damage. This is usually the result of a blockage in one or more of the coronary arteries. A blockage can develop due to a buildup of plaque or a substance mostly made of fat, cholesterol, and cellular waste products. This condition is collectively called as acute coronary syndrome (ACS).

On the basis of changes in the electrocardiogram (ECG/EKG) and cardiac biomarkers called troponin –T, ACS is divided into ST elevated myocardial infarction (STMI), Non ST elevated myocardial infarction and unstable angina (USA). Echocardiography is indicated if there are signs of heart failure, hemodynamic instability or frequent arrhythmias.

The risk of death and further cardiac events in patients with AMI is greatest during the first few days after the acute event, and the risk will remain increased during the first month. In order to identify the optimal treatment approach, the risk of short-term adverse outcomes must therefore be assessed (history, physical examination and ECG) without delay in all patients who are suspected to have cardiac chest pain. The more the high-risk criteria are fulfilled the greater the likelihood of a cardiac event and that extends the length of the hospital stay (LoS).

Oxygen therapy followed by dual antiplatelet therapy plays vital role in initial treatment of AMI patients. The best results are achieved with thrombolytic therapy like coronary angioplasty if it is administered within 1 to 2 hours of symptom onset. The benefit of the treatment is markedly reduced when more than 6 hours have elapsed from the symptom onset and hardly any benefit is to be expected when more than 12 hours have elapsed from the symptom onset.

After noninvasive therapy patient will be shifted to cardiac ICU for 24-48 hrs. For close monitoring and then to cardiac ward and will be discharged after 24-48 hrs. But in some cases certain factors which attributes to stay longer duration in hospital in AMI patients viz More frequent episodes of chest pain during the preceding 48 hours of PTCA, Prolonged chest pain with dyspnea, Increased cardiac biomarker concentration, Hemodynamic instability, Diabetes /hypertension, Arrhythmia (ventricular tachycardia or ventricular fibrillation), New or worsened mitral regurgitation murmur or ventricular gallop, Ischemia-induced heart failure and patients socio-

Theme Relevance. To study detail about the influencing factors which attributes LoS in AMI patient's in depth it's mandatory to develop an application which will help for patients as well as cardiologist .

Title - ROLE OF METABOLIC OBESITY AND BMI IN PATIENT WITH CORONARY ARTERY DISEASE: HOSPITAL BASED STUDY

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Introduction-

Obesity comes about when energy intake, principally stored as triglycerides, exceeds energy expenditure.The associations between body weight and metabolic abnormalities are not straight forward. A significant proportion of subjects with obesity do not develop dysmetabolic status and conversely, likewise dysmetabolic status can be present in lean subjects also. Therefore, it will become more important to distinguish obese individuals at high risk for obesity-related metabolic diseases from those who are metabolically 'healthy'. The dysmetabolic status might be clinically important in subjects with normal weight as well.

There has been considerable interest recently in the establishment of clinical criteria to identify individuals who are potentially at risk for metabolic and cardiovascular complications, but there are no comparative studies on those associations with angiographic CAD. Therefore, the aim of the present study is to compare findings of angiographic CAD according to groups by metabolic obesity (Insulin resistance syndrome) and weight status

Objectives:

- To study the severity of Coronary Artery Disease, according to groups by metabolically obese and/or weight status.
- To compare the association of insulin resistance , Lip(a) & hsCRP with severity of angiographic CAD among four groups

Theme Relevance:

- Relative importance of Obesity and metabolic obesity in relation to severity of coronary artery disease among four groups.

- Helpful to find how the insulin resistance syndrome is associated with the severity of coronary artery disease.

- Association of hsCRP, Neutrophil /Lymphocyte ratio and Lip(a) in severity of coronary artery disease among the four groups.

Challenges:

1. Distributing the patients into 4 different groups by seeing their anthropometric and clinical parameters.
2. Follow up of patients one month after angiogram to see the effect of lifestyle on their BMI .

Title: Analysis of Congestive Heart Failure re admission rate.

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Introduction: Heart failure (HF) is responsible for 491,600- 1.8 million admissions annually in India and is one of the leading medical causes of admission among people with mean age 53 years. Patients are very young for HF admission in India against 69 years in US and Europe. The in hospital mortality rate of HF in India is 10-30.8 percent against 4-7 per cent in the US and Europe. Estimates based both on data of established risk factors for heart failure (HF) as well as small studies suggest that the burden of HF in India is not < 2–5 million patients with an estimated prevalence of 2–3/1000 population. Hospitalization for HF and length of hospital stay (LOS) are significant independent predictors of mortality. The risk of mortality increases 5-10% following admission in comparison to pre-admission and re-admission rates as high as 30% for the 60-90 days after discharge and nearly 50% over 6 months. Patients admitted with reduced ejection fraction (HFrEF) are at an increased risk of mortality and re-hospitalization. Among hospitalizations for heart failure, heart failure with preserved ejection fraction (HFpEF) represents a growing proportion and may overtake HFrEF as the predominant form of AHF.

Primary objectives:

1. Assessment of re admission rate and factors responsible for re admission

Secondary objectives:

2. Evaluation long term outcomes including mortality in heart failure patients
3. Assessment of healthcare resource utilization in heart failure patients

Key Attributes:

- Patient's demography (age, sex)
- Medical history (cardiac & non cardiac)
- Precipitant for heart failure
- Ejection fraction
- Sign and symptoms
- Acute treatment of heart failure
- Vital signs
- Procedures done
- Lab reports
- Length of stay
- Discharge medication etc

Challenges:

- Mortality
- Predictive factors
- Healthcare resources utilization.

Changing HbA1c levels in response to anti diabetic treatment

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Optimal glycemic control is fundamental to the management of diabetes. Findings suggest that microvascular and macrovascular complications may be reduced by intensifying therapy targeting Hb A1C as a marker of quantifying glycemic damage.

HbA1c analysis has various advantages as a method for the diagnosis of prediabetes and type 2 diabetes. The A1C has several advantages relative to the FPG, including:

–greater convenience,since fasting is not required;

–greater preanalytical stability

– less day-to-day perturbations during periods of stress/illness.

In a nondiabetic adult population, corresponds to an A1C of 5.6%.

HbA1c is generally measured once every 3 months or even once every 6 months in a patient of Diabetes to check for glycemic control over the preceding 120 days. However, it is rarely thought of as an indicator of how well the patient has responded to therapy.

AIM : Project is to see how some patients have quickly lowered their HbA1c (which essentially means they have responded well to their choice of drugs) and how some have not responded.

Challenges :

- Can you calculate what is the shortest period during which we can pick up a significant change in HbA1c levels?
- Can we also come up with a factor/formula by which we can calculate the rate of change of HbA1c within 120 days?
- Can this factor/ formula be compared across patients ?

Assessment of factors associated with major adverse cardiac events (MACE) after coronary angioplasty

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Coronary artery disease (CAD) is the leading cause of the death in the western world presently. The complicated life style choice, unhealthy diet pattern and poor physical activity made its way acutely to India. Lately non-communicable CAD has substituted the tuberculosis, which was the top killer in 1990.Coronary heart disease is the most common type of heart disease, it is estimated that every year 2.4 million Indians die due to the coronary heart disease, out of this 30% from the urban and 15% from the rural population.

Percutaneous transluminal coronary angioplasty (PTCA) otherwise known as coronary revascularization is the safe and effective treatment of choice in Acute Coronary Syndrome (ACS). Which augments better symptom relief and enhanced quality of life of the patients, thus reduced mortality rate and incidence of heart failure.

The term MACE is a commonly used end point for cardiovascular research. By definition, MACE is a composite of clinical events and usually includes end points reflecting safety and effectiveness.

ACC/AHA defines MACE as Cardiac death, nonfatal reinfarction, clinically driven target lesion revascularization (TLR) or target vessel revascularization (TVR), stroke and heart failure which requires unplanned hospitalization or emergency room visit. Incidence of MACE is 10 to 15% after coronary angioplasty.

Lifestyle modification is indicated for all patients with coronary artery syndrome, irrespective of drug therapy. There is strong evidence that regular physical activity has an independent cardio-protective effect. Un-healthy diet, strenuous physical exercise, tobacco abuse, high blood pressure, high blood sugar and blood cholesterol level are identified cardiac risk factors, it is mandatory to avoid and control them after coronary revascularization with regular follow-up and proper medication for healthy and better quality of life.

Socio-economic status ,non compliance with medication ,psychological reaction like anxiety and depression also consider has the factor which may cause MACE.

Our aim is to see the assessment of factors associated with MACE after undergoing PTCA in short term follow up(1 to 6 month)

Evaluation of causative factors for amlodipine induced pedal edema.

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Introduction:

Hypertension is a major global health impact. The global burden of Hypertension is extremely high and globally one billion people are affected by hypertension and in India it has reached to 29.8%. Hypertension is most common risk factors for cardiovascular, cerebrovascular and renal diseases 1]. In most instances it is asymptomatic, until and unless it affects the major organs like heart, kidney, eye including Cerebrovascular, peripheral vascular system. Early detection and treatment will reduce the risk and improves their quality of life.

As for the JNC-8, guideline calcium channel blockers are the primary antihypertensive drugs. There are two types of CCBs present. Depending on the chemical structure they are classified into Dihydropyridine and non-Dihydropyridine group. Moreover, the different type of calcium channels present in our body, such as L, N, T, P/Q, and R-type. Pharmacokinetics and pharmacodynamics property vary between different classes of CCBs.

Blood pressure (BP) can be controlled by lifestyle modifications or with antihypertensive agents or both. Current pharmacological options to treat hypertension includes Diuretics, calcium channel blockers, angiotensin-converting enzyme inhibitors [ACEI],

angiotensin receptor blockers [ARB], sympatholytic drugs and vasodilators. The choice of drug therapy will be determined by the severity of diseases and associated patient factors.

Amlodipine is a third generation Dihydropyridine group of L-type of CCBs. It is a very potent and long acting drug and also a well-tolerated antihypertensive agent. Ankle edema is one of the most common and frequent adverse effect of amlodipine. Peripheral Edema is uncomfortable, sometime intolerable and may lead to decrease in patient's quality of life [8-9]. The incidence of peripheral edema ranges from 1.7% to 63.3%. Monotherapy showed higher incidence of pedal edema than the combination therapy with ARBs, ACEI group of drugs [6, 7]. According to study, about 9.3% of patients discontinue therapy because of its adverse effects. Overcoming this serious issue is to stop Amlodipine therapy and switch to another antihypertensive agent. Usually Diuretics is not effective in resolution of CCB induced pedal edema.

Edema is a condition where free fluids accumulate in the interstitial space. The important mechanism involves increased capillary hydrostatic pressure, decreased plasma oncotic pressure; increased capillary permeability and obstruction of the lymphatic system. Even though there are many mechanisms postulated for amlodipine induced pedal edema, the exact mechanism and causative factors of ankle edema by CCBs is not clearly understood.

Challenges:

The purpose of this study is to evaluate the causative factors for amlodipine induced pedal edema in hypertensive Patients.