STEMI Times:
The Past and Present
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The History of CAD (Coronary Artery Disease):
• The earliest clinical-pathological correlation of coronary disease was recorded by Bonetus in 1700
• First classical clinical sign and physical description of obstructive arteries documented by Herrick in 1912
• In 1949, Friedberg, documented arteriosclerosis occurred predominantly after the age of 40 and mostly in men, except in women with diabetes and hypertension and those who were postmenopausal
• Diabetes, family history, obesity, and heredity were known to predispose to heart disease

History (con’t):
• Signs and symptoms were pressure or squeezing pain radiating to neck and left arm provoked by exertion or emotion and relieved by rest
• Treatment consisted of making patient comfortable to include complete bedrest and a low calorie diet
• Complications included heart failure, shock, arrhythmias, venous thrombosis, cardiac rupture, stroke, and Dressler Syndrome
• Testing was limited. ECG’s were described by Wilson in 1933 and were 4 leads. In 1950, 12 leads were introduced. The Master 2-step was the precursor to the current treadmill and early echocardiography was reported in 1957.
• The average mortality rate was quoted to range from 40-50%. Friedberg reported that 25% of survivors of AMI lived for 10 or more years

CAD Today:
• Advanced tremendously in the 20th century
• In 1929, the first right heart cath in a human was performed by Werner Forssman on himself.
• Diagnostic cardiac catheterization was introduced by Andre Cournand and Dickinson Richards in the early 1940’s with selective coronary angiography described by Mason Sones in the early 1960’s
• Thrombolytic use began over 20 years ago and is still used today if immediate angioplasty is not available
• Timely revascularization by percutaneous coronary intervention (PCI) is preferred with drug-eluding stents
• The first stent was deployed by Puel and Sigwart in 1986 with the first balloon angioplasty performed in Switzerland in 1977

CAD Today (con’t):
• Coronary arterial bypass grafting (CABG) began in 1960 by R Goetz with the first IMA graft and form 1962-1967 SVG grafts were performed by D Sabiston
• Many standard medications are now given to include ASA, beta blockers, ACE inhibitors or ARB’s, platelet suppression medications, and the early use of statins.
• Early ambulation, early discharge, smoking cessation, cardiac rehab, and attention to depression is also important
• Testing includes troponins, echo, nuclear, stress testing, CT, MRI, and coronary angiography
• Chest pain centers are common for early diagnosis and treatment and the focus remains on early detection and care
• 683,000 patients in the United States are diagnosed with acute coronary syndrome (ACS) each year

• ST elevation myocardial infarction (STEMI) compromises 25-40% of those individuals

• The recommended approach of myocardial reperfusion is percutaneous coronary intervention (PCI) when it can be performed in a timely manner

Methods of Speeding Time to Reperfusion:
• One-call patient transfer service
• Educating the community on early heart attack care and use of 9-1-1
• Prehospital notification (from EMS) of STEMI initiating activation of STEMI team
• EMS taking the patient to the nearest PCI-receiving hospital
• Bypassing the ED—taking the patient directly to the cath lab for PCI
• Standardized treatments/algorithms for EMS, non-PCI referring facilities, and ED staff
• ALL improve patient outcomes and decrease in-hospital mortality

One-Call Patient Transfer Service
• Allows immediate access to ED provider for referring facilities
• Guaranteed admission to Methodist Jennie Edmundson for any medical patient

Mission Lifeline:
• Began 10 years ago originally in South Dakota focusing on developing a better system of care to treat patients with ST-segment elevation myocardial infarction (STEMI)
• The lead funder is The Leona M. and Harry B. Helmsley Charitable Trust which provided a grant of $4.6 million to the American Heart Association for the Mission: Lifeline initiative in Iowa
• Several states have Mission Lifeline to include: North Dakota, South Dakota, Wyoming, Minnesota, Nebraska, and Montana and now Iowa.
• Provides an optimal STEMI system of care: a system-wide data tool for quality measurement and improvement; ongoing medical provider training and STEMI education; coordination of protocols for rural EMS and hospital personnel; regional plans for rapid transport and/or transfer of patients; and a public education campaign on heart attack signs and symptoms and the need to activate the 9-1-1 system.
• Targeted funding provided to assist hospitals and ambulance services in acquiring essential ECG equipment and training.

Mission Lifeline/AHA/National Guidelines:
• Patients with a STEMI, should have a first medical contact to device (FMC2B) time of ≤ 90 minutes
• Patients with a STEMI, who are seen initially at a non-PCI-capable hospital, should be transferred to a PCI-capable hospital within door-in-door-out (DIDO) time ≤ 30 minutes
• Patients with an acute STEMI, who are transferred to a PCI-capable hospital, should receive primary PCI ≤ 120 minutes from FMC
• Patients with an AMI, should be prescribed an appropriate P2Y12 receptor inhibitor at hospital discharge
• Patients with AMI should be prescribed a high-intensity statin at hospital discharge

Development of Statewide STEMI Guidelines
Approved by Cardiology Team from State of Iowa
2014 FMC2B Times from Referring Facilities Prior to Mission Lifeline Guidelines and Staff Education

- FMC2B Time: 168 minutes (Non-PCI hospital is over 54 min away) with MJEH D2B time of 21 minutes
- Always chose to use Life Net over ground transportation
- Often in first ED over 30 minutes
- Delay in initiating STEMI call
- Confusion over STEMI protocols between different receiving PCI hospitals

2017 FMC2B Times from Referring Facilities After Mission Lifeline Guidelines and Staff Education and Continual Feedback/Team Support

- FMC2B Time 101-111 minutes (Non-PCI hospitals range from 54-77 min. away) with MJEH D2B times of 12 minutes
- Most frequent use of transportation is ground
- If ACLS ambulance, hospital may be bypassed and STEMI activated by EMS
- ED provider and cardiology support for EKG reading if needed
- Goal is to be in first ED 30 minutes or less
- IMMEDIATE STEMI activation from EMS or first ED
- Use of statewide Mission Lifeline EMS and Non-PCI guidelines
- On-going education to EMS, staff, and providers
- Ongoing feedback, support help, and direct contact with all referring hospitals
- STEMI’s go directly to cath lab if medically stable and cath lab team ready, bypassing ED

Questions?

References:


www.heart.org/HEARTORG/Professional/MissionLifelineHomePage