

Short communication

Cardiac vs. Non Cardiac Chest Pain: Prospect of Different Pathological and Physiological Etiologies and Managements

Abstract

Chest pain with/without etiologies are common phenomenon in day to day life .Like indigestion, dyspepsia and heartburn, people of third world country frequently suffer from these symptoms. Though it is not uncommon, lack of precautions and awareness it would be life threatening situation unless treatment module is activated. Different medical roles along with life style modification helpful in this regard for managing chest pain with different clinical features.

Key words: Atherosclerosis, MI, GERD, heartburn, Achalasia Cardia, Pulmonary embolism

Introduction

Chest pain is kind of discomfort probably associated with soreness on chest. It originated in different variants, ranging from a sharp stab to a dull ache sensation. Sometimes there may be crushing or burning like sensations.[1]Pain shifted to different parts like jaw,neck,back of the chest and adjacent areas.[2] In general, chest pain can be divided into heart or its great vessels originated (cardiac chest pain) and chest pain that is originated other than heart heart condition mainly in GIT region like Gastro Esophageal Reflux Disease (non-cardiac chest pain).[3][4]

Cardiac Chest Pain:

Cardiac chest pain (CCP) is occurred due to imbalance between the blood supply to the heart and oxygen requirement of heart muscle. Here pain occurs due to atherosclerosis (leading to fixed narrowing of coronary arteries). Coronary spasms may be another cause that narrow the arteries intermittently results coronary chest pain[5][6] This type of chest pain is also referred to as angina or angina pectoris.

Non Cardiac Chest Pain:

This type of chest pain is defined as recurring pain in one's chest- typically, near one's lateral sternal region and near the heart- that is not related to the heart.[7] A wide range of people who suffer from non cardiac chest pain are mostly chronic sufferer of Gastro Esophageal Reflux

Disease (GERD), Peptic Ulcer Disease (PUD) along with different lung and musculoskeletal complications. But this type of chest pain (NCCP) is diagnosed as a chronic condition.[8][9][10]

Epidemiology:

Data evidence to Cardiac and Non Cardiac Chest Pain in Bangladesh and around the world is relatively limited. At present, chest pain is one of the most common presentations to tertiary level hospital and health care providing institutes specially on emergency departments; whereas, only 35% of individuals who experience chest pain actually present to a hospital. These studies differ in many aspects such as NCCP definition, pattern of territory, sampling procedure and size and lifestyles. About 200 patients age range of 22-57yrs come towards the Islami Bank Central Hospital, Kakrail (IBCHK) Bangladesh who have complain of chest pain for last 2 months either generalized or localized. Some patients have history of spicy street/ beef or mutton gravy. After taking a few hours later they felt pain associated with vomiting, hiccup. Beside these, about 35% who are habituated in taking of oral anti ulcerant but this is not sufficient to decrease their discomfort. 10% of patients informed their mild history of chest pain which were sensitive to anti ulcerant drugs (Proton Pump Inhibitor, H2 receptor blockers and Acid neutralizers). About 15.0% patients we found retrosternal chest pain (who were also habituated in above mentioned drugs) that was confirmed in Electrocardiogram (ECG), Troponin I, CK-MB etc. 7% of them were needed to admit in indoor patient department (for non cardiological treatment purpose). Almost 4.3% have history of GERD or other symptoms like dyspepsia, Indigestion and spicy food intake but having ST elevation on ECG. Patients had chest pain due to lung/musculoskeletal pathologies about 12%, due to road traffic accident 11.5% and due to mental stress about 12%. Here is tabulated form of 200 patients analysis who came with complain of chest pain along with other symptoms

Table 1 : Complain of chest pain along with other symptoms

Traits	Total Number	Percentage
Patients with complaints of chest pain came to Emergency department	200	
Patients with history of taking anti GIT (Gastro Intestinal Tract) ulcerant drugs but needed parenteral anti GIT ulcerant drug for instant remedy	70	35%
Patients history of chest pain that is sensitive to oral conventional anti ulcerant drugs	20	10%
Patients who have chest pain confirmed as cardiological by ECG (no dyspepsia, indigestion present)	30	15%
Patients chest pain which has feature like dyspepsia but confirmed as cardiac pain after ECG	9	4.3%
Patients chest pain due to musculoskeletal, lung related cause	24	12%
Patients chest pain due to road traffic accident/trauma	23	11.5%
Patients chest pain history due to mental stress which	24	12%

need not any drug dependent remedy rather than rest		
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Results and discussion:

Here we see that about 35% of patients are usually habituated in oral anti GIT (Gastro Intestinal Tract) ulcerant drug but they need injectable medications where symptoms become severe.

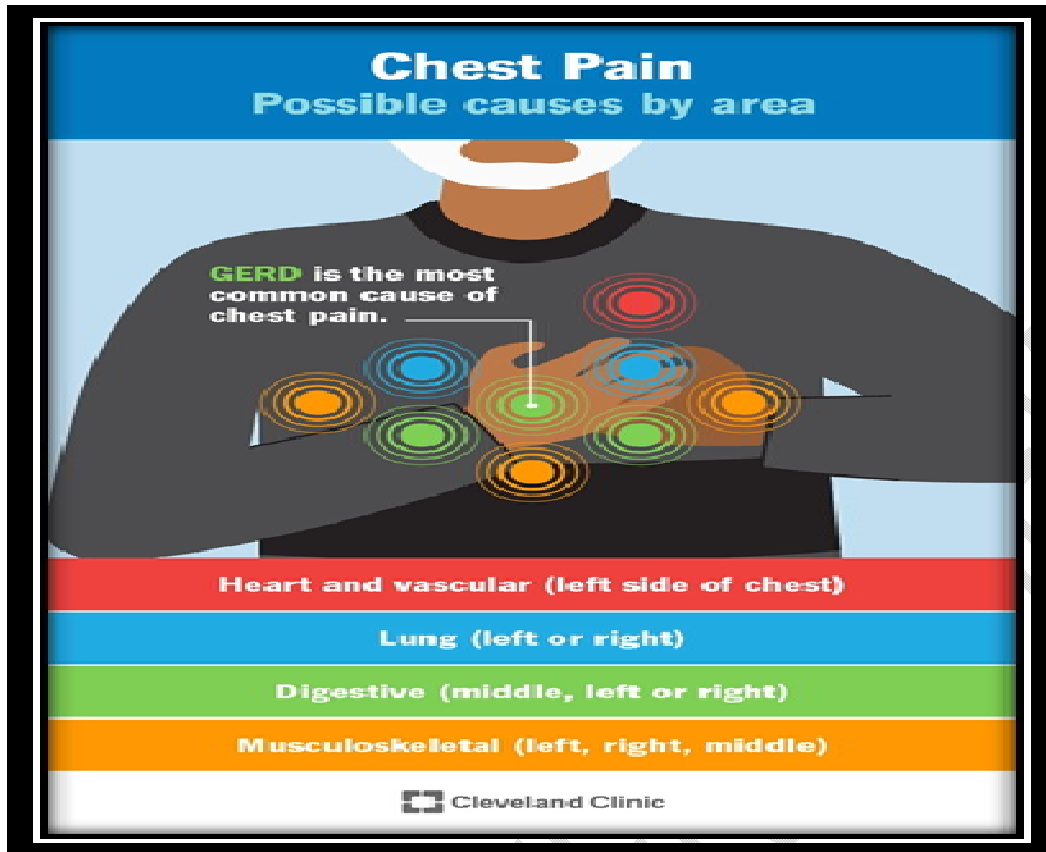
About 19.3% patients are sufferer of cardiac chest pain with/without GIT disturbance symptoms. Musculoskeletal and stress induced chest pain are equally important. Stress relieving should be emphasized in management of chest pain.

Table 2 : Comparison of Cardiac and Non Cardiac Chest pain:

Chest Pain	
Cardiac	Non-Cardiac
<ul style="list-style-type: none"> • “Pressure, or tightness” • Diffuse, poorly localized • Associated with physical exertion or other stress • Relieved with rest, usually within minutes • Prolonged symptoms may represent an acute coronary syndrome (MI) 	<ul style="list-style-type: none"> • “Sharp, or stabbing” • Focal, well localized • May be positional, spontaneous at rest • No predictable relation to physical exertion • May last from seconds to even days at a time

[11-12]

Fig.1 : Pictorial of site of chest pain:



[13]

Etiologies of Chest Pain:

From the above discussions we found some basic etiologies of chest pain.

Heart Related Etiologies

Heart attack- Due to obstruction of blood circulation , usually from clotted blood to the heart and heart muscle.[14-15]

Angina- Here chest pain occurred due to inadequate blood circulation to the heart. This usually caused by the thick atherosclerotic plaques in the inner walls of the coronary arteries. This results narrow the arteries and affected coronary blood supply, specifically during exertion.[16-18]

Aortic dissection- This life-threatening condition involves aorta (the main artery leading from the heart). If separation of inner layers of blood vessels occur, blood circulation through the layers results rupture of aorta.[19]

Pericarditis-Inflammation of pericardial sac which is known as pericarditis occurred during breathing or lying condition become worse along with sharp pain. [20-22]

Digestive etiologies:

Heartburn- Backward to thoracic cage, gastric acid washes up from the stomach into the esophagus along with burning like sensation.

Swallowing disorders- Esophageal disorders can make painful swallowing difficulties. Here patient become weak and sufferer of pancytopenia mostly. [23-26]

Other notable etiologies like Gastro Esophageal Reflux Disease, achalasia cardia, esophagitis etc. [27]

Muscle and bone causes:

Costochondritis- Cartilage of the rib cage, mainly the cartilage that adjoins to ribs along with sternum, becomes inflamed and painful.

Sore muscles- Chronic pain syndromes, like fibromyalgia, results persistent muscle-related chest pain.

[29-30]

Lung related etiologies-

Clotted blood in the lung (pulmonary embolism).

Inflammation of the lung covering membrane (pleurisy).

Carcinoma of lung

Lung Collapse(rare)

Pulmonary Hypertension

[31-33]

Clinical Features of Cardiac Chest Pain:

Tightness, pressure or fullness like sensations in the chest

Searing or crushing pain that spreads to back, neck, jaw, shoulders, and one or both arms

Pain lasting almost a few minutes, becomes worse with exertion, goes away and comes back, or varies in different intensity

Shortness of breath

Cold sweats

Dizziness / weakness

Nausea or vomiting.

[34-37]

Clinical Features of Non Cardiac Chest Pain:

Patients specially who suffers from GERD come to the hospital or any health service providing institute along with chest pain,nausea ,vomitting.Sometimes they come with epigastric discomfort which also included as classical features of GERD.Some typical classical characteristics/ symptoms are-

Sour taste or sensation of food reentering in mouth.

Swallowing difficulty

Pain worsen in exertion and deep breath/cough

Tenderness when one push on his/her chest.

Pain lasting for several hours. [38]

The classic symptoms of heartburn- painful, burning like sensation lateral to the sternum- can be exaggerated by problems with the heart or the stomach.[39]

Diagnostic criteria of Cardiac Chest Pain:

During taking patient's detail history and physical examination, medical personnel usually obtain an electrocardiogram (ECG) and a chest X-ray. ECG should be repeated 3 hours interval for assessing the cardiac condition and prognosis. Elevated blood levels of troponin I indicates coronary muscular damage.At present HS Troponin I has been introduced for rapid Myocardial Infarction diagnosis. Other blood tests, such as a complete blood count (CBC) and a basic metabolic profile, are effective on emergency basis. Some other criteria's are:

ETT (Exercise Tolerance Test)

Echocardiogram

Coronary Angiogram [40]

Diagnostic Tools of Non Cardiac Chest Pain:

Upper GIT endoscopy

Ultrasound

Esophageal motility test [41]

Risk Factors of Cardiac Chest Pain:

Age (between 40 and 60 years). Mid 30 yrs of age also included according to our data analysis.

Elevated fasting lipid profile.

Hypertension.

Diabetes Mellitus

Cigarette Smoking.

Lack of Physical activity.

[42]

For Non Cardiac specially GIT related chest pain a vital cause is irrational use of aspirin that cause GIT bleeding and other complications.

Management of Cardiac chest pain:

After confirmation, cardiac chest pain management must be immediately applied without any kind of delay. Patient and family should be advised and assured about treatment availability and asked to be patient. Appropriate medications like-

Artery Relaxers

Aspirin

Thrombolytic Drugs

Blood thinners

Surgical Management (when conservative management can't be sufficient)

Angioplasty and stent replacement

Bypass Surgery

Emergency Dissection Repair

Lung Reinflation

[43-44]

For Non Cardiac pain management should be both medications and life style modification based. Smoking, junk food should be avoided. Mental stress which was predominant in female for occurring chest pain should be noticed.

Effective medication management like-

Acid Reflux Treatment: By PPI, H2 receptor blocker

Acid Neutralizers- Sodium Alginate+sodium bicarbonate+ calcium bicarbonate

Pain Blockers: Tri Cyclic Anti Depressants (TCA), Selective Serotonin Reuptake Inhibitors.

Emotional and Behavioural Therapies.

[45-46]

Conclusion:

People of tropical country like Bangladesh are used to unaware of healthy lifestyle .Cardiac/Non Cardiac Chest pain become threatening due to lack of physical exercise and over intake of animal protein. That refers high LDL (Low Density Lipoprotein) in blood causing coronary artery obstruction. Ischemic Heart Diseases (IHD) is the ultimate results. Irrational pain killers, smoking triggers GERD like symptoms which also exaggerated cardiac chest pain. Life style modification with medication direction from physicians would be key to control this non communicable disease.

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