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IDENTIFICATION AND EXAMINATION OF LOW RISK CHEST PAIN ADMISSIONS IN TERM OF STRESS TESTING

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Abstract:
Background: To know about non-cardiac chest pain is burden step on health resources. It requires various expensive medical testing.
Objective: this study aims at identification and examination of low risk chest pain admissions in term of stress testing.
Duration: Time period for this study was 4 months. research was completed at Mayo Hospital Lahore from Feb, 2017 to Jan 2018.
Patients and Methods: Patients with atypical chest pain having no prior history of coronary artery disease, were selected. Risk factors for coronary artery disease was elevated. Adverse cardiac events regarding patients were reviewed and 30 days' re-hospitalization was done.
Results: Total 164 patients were selected with mean age of 60 years. Males were 33.5% various risk factors were taken into account such as hypertension, smoking etc. two patients had positive troponin and undergoes through subsequent negative stress tests. In 48% patients, stress test was performed 2.6% test were positive and 97.4% were negative. Positive test shows normal coronary arteries.
Conclusion: Stress testing in low risk chest pain patients is not beneficial.
Keywords: *Stress testing, Chest Pain, Cardiac pain, low risk.*

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INTRODUCTION:

Patients with complain of typical chest pain with no prior history of coronary artery disease, is a challenging problem. In VS, chest pain is 2nd most common clinical problem behind gastrointestinal issues with over 8 million visitors [1]. Electrocardiograms, serial cardiac biomarkers and stress testing is required to diagnose coronary arteries disease. Most of time unnecessary testing and prolonged hospitals stays occurs in such situations. The American Heart Associations recommended that patients which have normal heart rhythms, normal or near normal electrocardiograms and negative cardiac biomarkers are at low risk for acute coronary syndrome [2]. Resent research reported that one set of biomarkers, an ECG and history of coronary artery disease has been described as simplest low risk criteria with < 6% probability of myocardial infraction [3]. Risk for disease are detriment on the basis of TIMI risk scoring criteria for chest pain patients [4]. ACI- TJPI score and GRACE score look at the admission variable for risk identification. [5,6]. North American chest pain rule is undergoing validation in order to assess

patients risk efficiently and avoid unnecessary testing [7]. Now, hospital stay is focused to decreased [8]. This study was done to determine the requirement of impatient stress test for a low risk chest pain patient.

PATIENTS AND METHODS:

Study was done at Mayo Hospital Lahore from Feb, 2017 to Jan 2018. There were 392 patients, out of which 120 patients were admitted to LH and were excluded.

Two groups of patients were made. 1 group did not undergo impatient stress test while other did go. Data was collected from patients. Risk factor for CAD were evaluated. Adverse Cardiac events regarding patients were reviewed and noted down in charts in 30 days' re-hospitalization was compared between two groups. Data was analyzed using SPSS version 22.

RESULT:

Total 164 patients were selected with age of 60 years. Males were 33.5%. Hypertension, smoking and various other risk factors were studied.

Table I: Inclusion and Exclusion Criteria

Inclusion Criteria:
1. Patients admitted to AMH with primary diagnosis of chest pain
2. Atypical chest pain
3. Initial troponin level negative (< 0.10 ng/ml) in the emergency department
4. Normal or near normal initial EKG
5. No prior history of coronary artery disease

Exclusion Criteria   :
1. Typical chest pain that should include all of the following:
   a. Typical substernal pressure like chest pain without pleurisy and chest wall tenderness
   b. Pain that is aggravated by exertion or relieves with rest and sublingual nitroglycerin
2. Initial troponin level positive (> 0.10 ng/ml) in the emergency department 3. Initial EKG showing any of the following changes suggestive of ACS:
   a. ST segment elevation ≥1mm in two contiguous chest or limb   leads
   b. New left bundle block pattern
   c. ST segment depressions or T wave inversions in two contiguous leads
4. Prior history of coronary artery disease determined by presence of any of the following:
   a. Prior PCI
   b. Known coronary lesion >50% stenosis
   c. Prior ACS (STEMI, NSTEMI, unstable angina)

Table II: Patient Characteristics (N = 164)

Characteristics	Number	Percentage
Male	55	33.5
Hypertension	104	63
Diabetes Mellitus	38	23
Current Smoker	32	20
Hyperlipidemia	80	49
Family CAD History	62	38
Troponin Elevation	2	1.2
Stress Test Performed	78	48
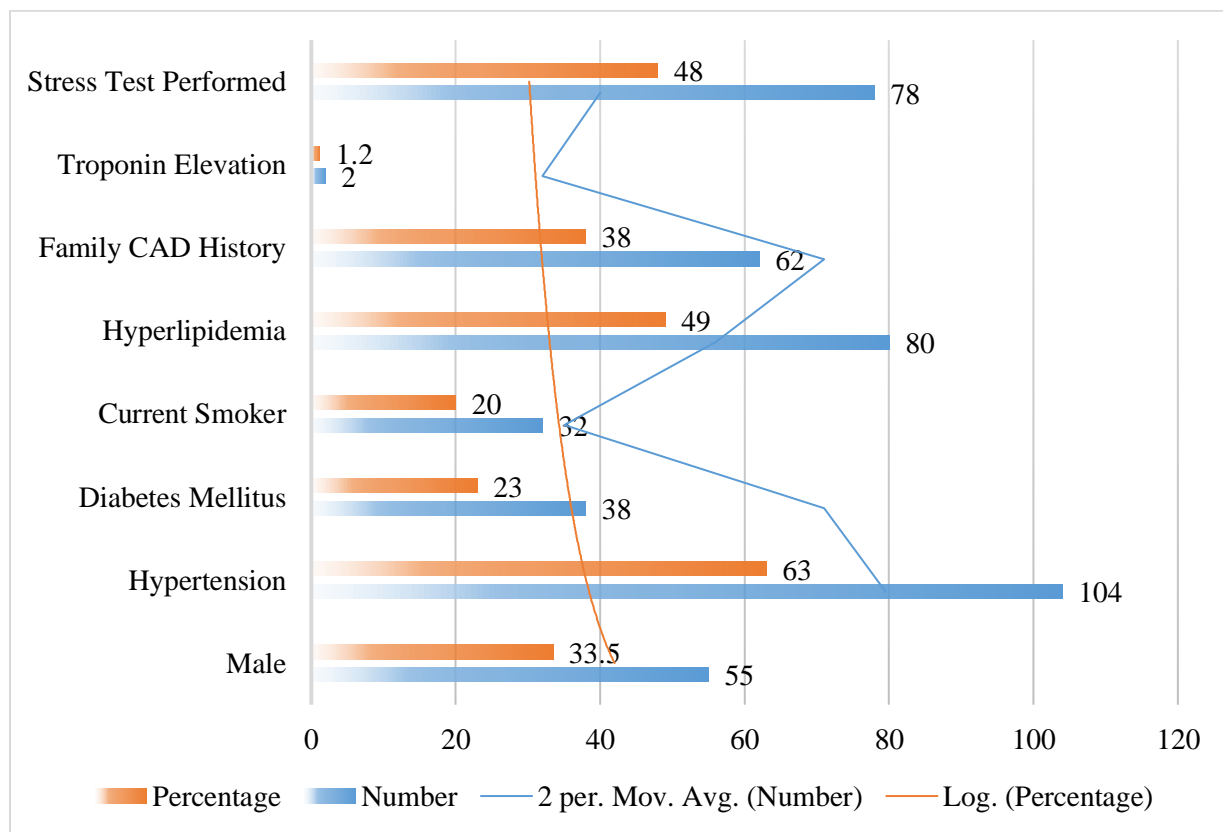
Troponin elevation in 2nd set was seen only in 2 patients. Peak troponin level was 0.43ng/ml. Stress tests for both patients show no CAD.

Figure I: Inclusion and Exclusion of Study Subjects
CAD, coronary artery Disease; EKG, electrocardiogram; PE, pulmonary embolism; PNA, pneumonia;
UTI, urinary tract infection, Stressed, underwent provocative (stress) testing.
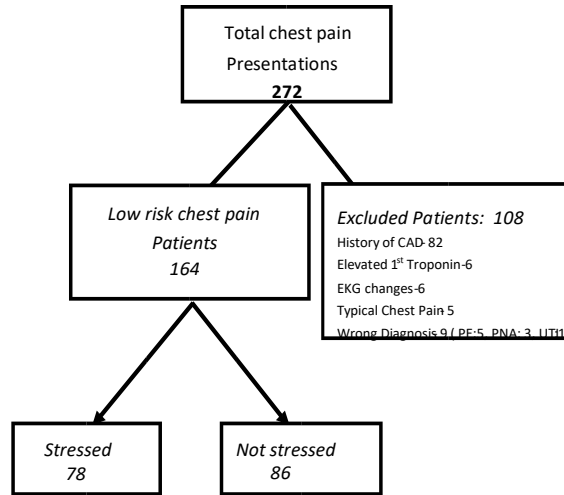
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┌─────────────────────┐
│  Total chest pain   │
│   Presentations     │
│        272          │
└─────────────────────┘
           │
    ┌──────┴──────┐
    │             │
┌──────────────────┐   ┌────────────────────────────────────┐
│ Low risk chest   │   │ Excluded Patients:  108            │
│ pain Patients    │   │ History of CAD- 82                 │
│      164         │   │ Elevated 1st Troponin-6            │
└──────────────────┘   │ EKG changes-6                      │
    │                  │ Typical Chest Pain 5               │
    │                  │ Wrong Diagnosis 9 ( PE-5, PNA- 3, UTI1) │
┌───┴────┐             └────────────────────────────────────┘
│        │
┌──────────┐   ┌──────────┐
│ Stressed │   │ Not stressed │
│    78    │   │    86    │
└──────────┘   └──────────┘
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Figure II: Patients in TIMI classes and percentage of stressed in each class.

Stress Classes		Number/ Percentage
Patients (Number)	TIMI 0	26
	TIMI 1	53
	TIMI 2	44
	TIMI 3	31
	TIMI 4	10
Stressed Patients (Percentage)	TIMI 0	53
	TIMI 1	37
	TIMI 2	50
	TIMI 3	52
	TIMI 4	60
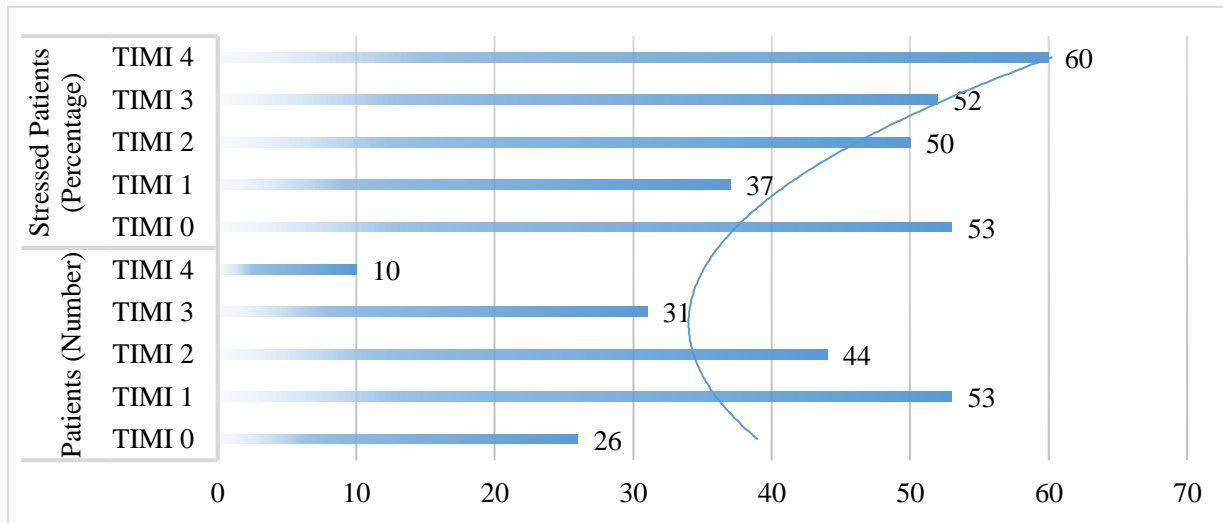
Risk identification was done by TIMI risk 0 to a maximum 4 score. In 48% patients, stress test was performed. Patients with higher TIMI scores underwent more stress test and Pearson chi-square analysis was done to find it out. In 48% patients, stress test was performed. 2.6% tests were positive and 97.4% were negative. Positive tests demonstrated normal coronary arteries. Impatient stress tests increased hospital stay.

DISCUSSION:

This study provides the evidence that stress testing in low risk chest pain patients is not beneficial. Same result was found in previously done observational studies. Most patients with complain of chest pain belong to low risk groups. Herman et al showed high false positive rate of exercise testing in low risk patients with test positive in only 6 patients out of 220 [9]. Similar result was found in some other studies [12]. Specificity and sensitivity of exercise tolerance tests to diagnose CAD without myocardial perfusion imaging is 75% and 70% respectively. With myocardial perfusion imaging is 75% and 70% respectively [13]. With myocardial perfusion imaging, sensitivity of this test increase to 90% [14]. Manu observational studies safe the discharge of low risk patients from hospital and ACS is ruled out [15,16,17]. Measurement of cardiac biomarker is necessary for patients with chest pain in order to exclude the reduced blood flow towards heart [18,19]. Appropriate clinical judgement is necessary for making decisions to order impatient stress test. The patients which shows intermediate or high probability of coronary arteries disease, will have increased positive value of stress test. This will result in various unnecessary tests and Cardiac catheterization. Risk for disease are determined on basis of TIMI risk scoring criteria for chest pain patients. ACI-TIPI score and Grace score are effect in checking admissions variable for risk identification.

CONCLUSION:

Total 164 patients were selected with mean age of 60 years. Males were 33.5% various risk factors were taken into account such as hypertension, smoking etc. two patients had positive troponin and undergoes through subsequent negative stress tests. In 48% patients, stress test was performed 2.6% test were positive and 97.4% were negative. Positive test shows normal coronary arteries. This study clearly proves that stress in low risk chest pain patients is not beneficial.

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