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Clinical presentation and outcome in patients with unstable angina and nstemi with reference to admission time electrocardiogram

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Abstract
In developing countries like India where limited resources available in the field of health care services we can utilize our clinical skills and ECG impressions for prognostication purpose and further managing the patients in the better way. The purpose of the study is to study the various clinical presentation in patients with unstable angina, NSTEMI. Study carried out in 100 patients with unstable angina and NSTEMI. We find statistical significant correlation between wall of myocardium affected with final outcome (p=0.0002). However complication rate was highest in group with multiple ST-T changes (global). No complications were seen in patients with ECG changes in Lateral wall. Commonest outcome we encountered in complicated outcome cases was acute myocardial infarction, a total of 6 patients. We observed 5 patients with of arrhythmia (3 patients of supra-ventricular tachycardia and 2 patients with non-sustained ventricular tachycardia). A total of 3 patients succumbed to death during hospital stay. We also found 2 patients each develop CHF/LVF and recurrent angina. Between TIMI risk score and final outcome we did not find significant correlation.

Keywords: unstable angina, coronary artery disease, angina pectoris, Nstemi, Ecg

1. Introduction
Angina pectoris literally translates as 'strangling in the chest'. William Herbeden who presented one of the earliest description of angina pectoris in 1768 in a lecture to Royal college of Physicians [1]. There is fine line between the labels of unstable angina and NSTEMI Generally this line relates to development of persistent ECG changes plus elevated Cardiac enzymes and markers. However the underlying pathology is similar for both conditions and clinical presentation may be similar [2]. Second half of 20th century has witnessed global spread of Coronary Artery Disease especially in Developing countries like India. Nomad *et al* (1983) reported that coronary artery disease and its terminal most dramatic and lethal presentation of acute myocardial infarction are the major causes of the death in both the developed and developing countries [3]. Several surveys have shown prevalence of Coronary Artery Disease in India is been rising. A recent systemic review, prevalence obtained through cross sectionals surveys was 3-4% in rural area and 8-10% in urban area in individuals aged >20 years [4]. The classic natural history studies of UA in 1970 and early 80's provided first clue on the utility of ECG record during chest pain [5]. Clinical description of progression of angina symptoms to myocardial infarction and death [6]. Present study was designed to know different clinical presentations in patients with unstable angina and NSTEMI, admission time ECG changes and their correlation with final outcome as well as prognostic importance. Clinical examination and clinical judgment along with ECG till the date remains cheapest, noninvasive, easily accessible, convenient and easy to carry out mode of investigation in patients with unstable angina and NSTEMI.

Aim and Objectives
To study co-relation between admission times ECG changes in patient with unstable angina, NSTEMI and its prognostic importance. To study the various clinical presentation in patients with unstable angina, NSTEMI and their risk stratification and its co- relation to prognosis.

Review of Literature
Angina Pectoris is one of the manifestations of coronary artery disease secondary to transient myocardial ischemia and is associated with a disturbance of myocardial function but without evidence of myocardial necrosis. Myocardial ischaemia, results in release of substances like adenosine, histamine, bradykinin, serotonin which stimulate the sensory endplates of intracranial Sympathetic nerves from which impulses are carried to sympathetic ganglion to thalamus and finally to cortex [7].

Classic angina is diffuse retrosternal chest pain that typically radiates to neck Jaw and left arm. It is crushing, aching, tightness or band like sensation in chest. Associated symptoms include dyspnea, nausea, vomiting, diaphoresis and presyncope. Pain often begins abruptly lasting 5-15 min taking several minutes to reach maximum intensity. A longer duration of pain suggests acute myocardial infarction. Chest pain that is localized and exacerbates with respiration, positional changes and palpitations is unlikely to be of ischaemic in nature. Many patients will report only chest discomfort than a frank pain. Atypical presentations are not uncommon like burning epigastric pain may be the presenting feature [8]. A minority (5%) of patients may present with sharp stabbing or fleeting pain. Women, diabetics and elderly men

are most at risk for such presentation. Elderly patients who develop Acute Coronary Syndrome can present with range of complaints including generalized weakness, syncope, altered mental status, dyspnea [9]. CCS and left main disease were found to have significant-correlation in study carried out in Madras medical college in 2004 [10]. ACRE study (appropriateness of coronary revascularization study) carried out in 2249 patients with Unstable angina showed linear association of CCS class with angiographic findings, mortality rates and acute myocardial infarction [11]. Kaul *et al* in 2009 evaluated positive correlation between CCS and long term mortality. Higher mortality was found in class 3 and 4 [12]. In 1973, these showed that there notices were combined with cellular and molecular biological Knowles of artery a new hypothesis, respose to injury hypothesis [13]. In 1982, a second hypothesis suggesting that the lesion of atherosclerosis may represent some form of neoplasia was suggested named monoclonal hypothesis [14]. Multiple risk factors like Diabetes Mellitus, dyslipidemia, hypertension,15 homocysteinemia, smoking etc. cause functional impairment of endothelium leading to increased lipid influx, subsequently forms atheroma and thrombus causes progressive occlusion of vessel wall. Admission ECG features as the presence, magnitude and the extent of ST shift had been correlated to their ability to predict unfavorable angiographic feat. Langer *et al* and Dederholm in FRISC II study found a significantly higher prevalence of multivessel and left main disease amongst the patient with unstable 'angina who had ST increase on admission time ECG. [15, 16] Cohen *et al* (1991) studied 90 patients of unstable angina concluded patients with ST deviation more than or equal to 1 mm in two or more than two leads have higher '6 month rates of Myocardial infarction, recurrent angina and death than in patients with no ST-T changes. Unstable Angina, it was seen that extent of myocardium in jeopardy had the strong correlation with total no of leads bearing ST deviation on admission ECG to lesser degree with maximal or sum of ST deviation [17]. Gusto 2b study, refractory ischaemia was defined as recurrent ischemic symptom with. ST-T changed greater than 10 minutes despite medical therapy. It was associated with a near tripling of adjusted 1 year mortality among those meriting with Acute Coronary Syndrome thus highlighting the prognostic importance of ST deviation recorded during Chest pain [18]. Prodromal unstable angina is a strong predictor of infarct size and indicates smaller infarct size reflected by CK MB and CK total measurements and lower 30 day, 6 months and 5 year mortality [19]. Patient was once considered to have non ST elevation myocardial infarctions when CK-MB release was greater than twice upper limit of normal. Limitation of CK-MB measurement is the late rise in setting of acute myocardial infarction reducing value of this measurement for guiding rapid therapeutic decision making. Best available routine marker for acute myocardial infarction early detection after onset of pain myoglobin reaches elevated serum concentrations within 4-6 hrs. Myoglobin has short half-life specificity is low as elevated levels often found in non-cardiac conditions [20].

Lee *et al* in 1993 studied 136 patients of unstable angina to correlate depth of ST depression with mortality gradient at the end of one year. 1 year mortality was low in patients with ST depression 1 mm (14%) but high in patient with 2 mm ST depression (39%, P<0.08).~ It was found to be 39% in patients with ST depression > 3 mm (patient with acute coronary syndrome who present with ST depression [21].

Material and Methods

The study was carried out at the Department of medicine, Krishna Institute of medical sciences Karad from October 2011 to July 2013. Considering inclusion and exclusion criteria, 100 patients were included in the study. Patients were classified as Patients with UA and Patients with NSTEMI. Both these groups were sub-classified according to gender and age group. All 100 patients was divided in CCS classification as per their presenting symptom. All the patients of Inferior wall ECG changes also studied for right sided chest leads. If patients did not get any problem related to disease per se (i.e. pertaining to unstable angina/NSTEMI) during stay in the hospital was included in group A (Favourable outcome with no complication) If during stay in the hospital if patient presents with problem related to unstable angina/NSTEMI, was included in group B (Non favourable outcome / complication group) only the primary outcome of the unstable angina and NSTEMI during hospital stay, the worse outcome resulting as a progression of primary outcome or appeared independently was taken as the single outcome of disease process for ease of the study. This is a hospital based observational study in patients with unstable angina and NSTEMI.

Observations and Results

In present study, out of total 100 patients, 51(51%) were males and 49(49%) were females. Male to female ratio 1.04:1.

Table 1: Male and Female distribution of patients with Unstable angina (UA) and NSTEMI

Variables	Unstable Angina(UA)	NSTEMI	Total
Male	41 (53.2%)	10(43.5%)	51(51%)
Female	36 (46.8%)	13(56.5%)	49(49%)
Total	77	23	100

As seen is table 1, total of 41(53.2%) males and 36(46.8%) females presented with Unstable angina. A total 10(43.5%) males and 13 (56.5%) females were presented with NSTEMI

Table 2: Mean and standard deviation of age of patients with UA and NSTEMI

Variables	Unstable Angina (n=77)		NSTEMI (n=23)		Total (n=100)	
Age (years)	Male	Female	Male	Female	Male	Female
	59.49 ±14.33	56.22 ±11.77	68.0 ±12.29	63.31 ±9.80	61.15 ±14.25	57.95 ±11.70

As seen in table no. 2, the mean age of the study population was 61.15±14.25 and 57.95±14.25 years for males and females respectively. However the mean age of Unstable angina subgroup was 59.49±14.33 and 56.22 ±11.77years for

males and female respectively and 68±12.29 and 63.32 ±9.80 years for male and females respectively in NSTEMI subgroups.

Table 3: Distribution of patients by age and sex in UA and NSTEMI

Age groups (years)	Male (n=51)	Female (n=49)	Total (n=100)	X2	'P'	S/NS
21 to 30	0	0	0	2.82	0.58	NS
31 to 40	5(9.8%)	5(10.2%)	10(10%)			
41 to 50	8(15.68%)	10(20.4%)	18(18%)			
51 to 60	12(23.52%)	13(26.53%)	25(25%)			
61 to 70	16(31.37%)	17(34.69%)	33(33%)			
> 71	10(19.60%)	4(8.16%)	14(14%)			

As per table 3, all 100 cases were distributed according to their age and sex. Six age groups were made that were 21-30, 31-40, 41-50,51-60,61-70 and >70. Maximum number of patients were in age group of 61-70 years. Minimum number of patients were in age group of 31-40 years. We did not find any patient between 21 to 30 years age group.

Discussion

Patients with Unstable angina and NSTEMI constitute heterogenous group because of diversity pathologic mechanisms responsible for condition and different clinical manifestation of syndrome. Prognosis varies in patients with Unstable angina and NSTEMI due to heterogenous nature of the condition. As a clinical syndrome UA and NSTEMI encompasses variety of clinical presentations associated with transient episodes of acute myocardial ischaemia. These episodes are caused by obstruction to coronary blood flow and involve different pathophysiologic mechanisms. The risk in a given patient depends on underlying pathophysiology and clinical presentation. The successful management of UA and NSTEMI requires appropriate risk stratification for effective treatment. In our study, risk stratification was done by clinical examination, CCS class, TIMI risk score and various ECG changes and also their prognostic importance for better long term management.

Out of 100 patients with UA and NSTEMI (51 males and 49 females), 41(80.39%) males and 41(83.67%) females there were no complications. While 10(19.60%) males and 8(16.32%) females develop complications during hospital stay.

Out of 77 patients with UA (41 males and 36 females), 34(82.92%) males and 31(86.11%) females there were no complications. While 7(17.07%) males and 5(13.88%) females develop complications during hospital stay.10 (76.92%) females there were no complications. While 3(30%) males and 3(23.07%) females develop complications during hospital stay.

Heng MK *et al* showed in his study that The Canadian cardiovascular society class was independently predictive for the adverse events. They observed CCS class 3 & 4, adverse effect rates were 37% and 64% respectively [22].

Conclusion

Unstable angina and NSTEMI encompass a wide spectrum of clinical presentation with different base line risk and extent or coronary disease.Early risk stratification of patients with acute coronary syndrome is important. 12 lead surface ECG is a simple, less expensive, noninvasive, bed side test for detecting ischemia. In developing countries like India where limited resources available in the field of health care services we can utilize our clinical skills and ECG impressions for prognostication purpose and further managing the patients in the better way. The most important finding of the study is Multiple ST-T changes (global ischemia) and T wave inversion ≥2mm without ST segment deviation is a powerful and incremental predictor of adverse in hospital outcome in patients with Unstable angina and NSTEMI. Early adequate medical treatment and intervention in these patients may substantially reduce cardiac events.

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