Original Article

Preintensive care: Thrombolytic (streptokinase or tenecteplase) in ST elevated acute myocardial infarction at peripheral hospital

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Abstract

Background: Coronary artery disease is a major cause of death in India. Sudden death preceded by chest pain is due to acute myocardial infarction. Villagers are aware and afraid of chest pain. Majority of chest pain victims attend the primary physician in golden hours. Hence, primary doctors can play important role for early thrombolysis and salvage the myocardium from irreversible injury. This study determined year mortality in a patient who received the rapid thrombolysis at primary care hospital (streptokinase or tenecteplase) at rural setting. **Setting:** Peripheral General Hospital Mahad on Mumbai–Goa highway. **Patients and Methods:** Patients with typical chest pain with electrocardiogram showed ST segment elevated myocardial infarction (STEMI) with or without risk factors admitted from 2005 to march 2016 were studied. Details clinically studied: time interval between chest pain to hospital, hospital to needle time, reperfusion and arrhythmias. Time required for regression of elevated ST segment, a response to thrombolytic (streptokinase or tenecteplase) therapy, is studied. **Results:** Total 244 patient reported with chest pain of these 35 cases brought dead with history of chest pain and convulsive moment before they died. Of these, 209 patients had acute STEMI. Of these, 162 received streptokinase (STK) and 47 received tenecteplase (TNP)]. Analysis of STK Vs TNP patients 18 (11.11%) versus 3 (6.38%) ($P = 0.361$) died during the treatment. Around 17 (18.49%) vs 5 (10.63%) ($P = 0.941$) did not show signs of reperfusion, respectively. Re infarction occurred during hospitalization 3 (2.5%) versus 3 (6.38%) ($P = 0.094$) cases. Around 12 (7.40%) versus 0% ($P = 0.072$) died at the end of 12 months of thrombolytic therapy. **Conclusion:** Thrombolysis of STEMI within golden hours improved the reperfusion. However, 1-year fatality is significance with streptokinase as compared with tenecteplase.

Keywords: Streptokinase, tenecteplase, thrombolysis

Introduction

Coronary artery disease (CAD) is currently most common, noncommunicable disease in India. One of the gravest complications of CAD is ST segment elevation myocardial infarction (STEMI) and sudden death.[1] Reperfusion is the key strategy in acute STEMI care and it is time dependent.[2] Among 20,468 patients enrolled in CREATE trial, over 60% (12405) patients had STEMI, a proportion that is substantially higher than registry from developed countries, which documented around 40%. The median time from the onset of symptoms to hospital arrival was 300 minutes in STEMI patients, again more than double delay reported in developed countries (range 140–170 minutes). Clinical outcomes were worse in patients with STEMI as compared with patients with non-STEMI, with lower rate of death (8.6% vs. 3.7% reinfarction (2.3% vs. 1.2%) and stroke (0.7% vs. 0.3) $P < 0.0001$ for all. Approximately 59% received thrombolytic therapy and only 9% underwent percuteneous coronary intervention (PCI) during their hospitalization, suggesting substantial room for

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improvement in the use of acute perfusion therapy in STEMI patients in India.[3,4]

As India has grown economically, it has experienced an epidemiological transition, with mortality due to ischemic heart disease. Coronary heart disease would rise in developing nations by 137% by 2020.[5] India is going most rapid epidemiological transition from communicable to noncommunicable diseases often neglected and at third stage of the transition characterized by high burden of atherothrombotic dominated noncommunicable diseases.[6] Still there is long way to go to achieve the PCI within golden hours with hospital to balloon time 90 minutes. Review of cross-sectional survey in 2008 showed that 3%–4% and 8%–10% of rural and urban Indian dwellers, respectively, have CAD.[7] In India, CAD is the leading cause of death.[7] Compared with western world, CAD epidemiology in India is characterized by premature occurrence in the young and low/middle income group, high mortality, and high prevalence of diabetes.[5,6,8] The outcome of acute STEMI may, however, be influenced by the level of health care or hospital setting. In particular, little information is available about acute myocardial infarction in rural areas, where most of the Indian population lives.

Many clinical trials have also explored therapeutic innovations, and there is an emerging discipline that assesses healthcare system for optimum delivery of this care. Significant improvements in morbidity include the specific of local care structure. Mortality needs comprehensive approach. Because of urbanization of villages, incidence of diabetes, hypertension, malnutrition, familial genetic predisposes in addition to other risk factors including smoking, consumption of tobacco in form of chewing, paste application, eating with betel nut, Gutekha, and dyslipidemia attributing rise in incidence of acute coronary syndromes.[8] Increased in literacy rate, improvement of sanitation, sterile drinking water, and boiled food result in B12; folic acid deficiency and hyperhomocysteinemia are the risk factors for acute coronary syndrome.[9,10] Commonest cause of acute myocardial infarction is coronary artery occlusion from plaque vulnerable to rupture or its erosion.[11,12] Thrombotic process reduces microcirculatory perfusion by reduced coronary artery flow through epicardial vessels stenosis and by distal embolization of thrombus. This pathophysiology produces the rationale for fibrinolytic and antithrombotic therapies, whereas residual epicardial stenoses are target for percutaneous and surgical revascularization approaches.[13] Early reperfusion therapies can prevent detectable myonecrosis. Aborted myocardial infarction is seen in up to 25% of patients treated within 1 h of symptom onset with thrombolysis.[14] We believe that at peripheral hospital like that in Mahad, thrombolysis is needed because it is impossible for a patient to reach tertiary care hospital within evidence-based time frames required for full effectiveness. In patient with STEMI, the earlier the patient presents and the earlier are arteries can be recanalized, the better. Degree of reversibility and extent of myocardial necrosis were both time dependent.[15] The key to successful outcomes in treating heart attack is short times of treatment. The longer the time to treatment, the more damage occurs to the heart muscles.[16] Each minute's delay in reperfusion affects mortality. In a situation like that in rural setting, an alternative to primary PCI was to encourage peripheral hospital thrombolysis.[17] Thus, thrombolysis could be an important strategy in patients unable to receive primary angioplasty in myocardial infarction (PAMI) after STEMI within 1 h of first medical contact. Thrombolysis still seems to have an important part to play in the management of patients with STEMI especially in those who cannot reach a PCI center quickly. Self-awareness in rural population is increased due sudden deaths preceded by chest pain and physicians are available at nearby taluka. We report in details the role of thrombolysis in STEMI patient at rural setting.

Patients' Method

At Mahad irrepective of non availability of trained staffs we have to manage acute dire life threatening time limiting medical emergencies including snake bite, scorpion sting, shock and acute myocardial infarction. We both HSB and PHB sat by the side of patient and closely monitored each beat and vital signs. This preserve the time for taking rapid decision regarding thrombolysis, and early detection of life threatening lethal arrhythmias like atrial, ventricular tachycardia, and ventricular fibrillation. With acute chest pain in STEMI, no patient or relative want to take risk and not ready to give written consent for randomized trial. Thus, we planned a prospective study.

This is prospective study conducted at Mahad, a 20,000 population situated at west coast 180 km south of Mumbai at Mumbai–Goa highway. This is high rainfall region surrounded by thick jungle. At Mahad, main occupation of population is farming and labor work. Common diet includes meat, fish, coconut, and dry fish curry with rice. Patient with central substernal chest pain, with radiation to both shoulder, back, lower jaw, feeling of suffocation, epigastric fullness with flatulence, profound weakness, giddiness sudden onset, and uneasiness in chest accompanied with risk factors including consumption of tobacco in the form of tobacco chewing, application of *maseri* (paste prepared from burned tobacco, applied in the morning of three to four setting during day), *Bidi*, cigarette smoking, hyperlipidemia, diabetes mellitus, hypertension, sedentary life style, stressful profession, and family history of ischemic heart disease.

On arrival of patient with chest pain at the outpatient department, immediately we took electrocardiogram, evidence of acute STEMI confirmed by ECG finding of at least 2 mm ST elevation in to contiguous peripheral or precordial leads.[18] We closely observed time between onsets of chest pain to hospital and hospital to needle time. ECG done every 15 minutes of those cases with typical angina pectoris with continuous chest discomfort to rule out acute coronary syndrome.

Patient with chest pain with STEMI immediately shifted to bed attached with multipara cardiac monitor (noninvasive blood pressure, rhythm monitor, and probe of SPO_2.) and central oxygen. We both doctors work together; soon after admission,

immediately author PHB took ECG. Author HSB read the ECG. Orally 600 mg of clopidogrel and 325 mg aspirin to chew [Figure 1]. Then, author B discussed with close relative regarding thrombolytic agent with details of advantage and disadvantage of streptokinase (cost $25) and tenecteplase (TNP) ($457). In this study, 162 (78%) gave consent for streptokinase (STK) and 47 (22%) for teneteplase (TNP).

Protocol

About 1.5 million units of STK added to 100 mL of normal saline intravenous infusion over 60 minutes, preceded by 100 mg bolus of hydrocortisome. TNP 0.5 mg/kg of body weight given by fast intravenous bolus preceded by 30 mg low molecular weight heparin by intravenous route. HSB and PHB closely monitored patient for arrhythmias, hypotension, acute bleed, and regression or no improvement in ST segment elevation and reduction of chest pain. ECG repeated every 30 minutes or in case of reinfarction. Irrespective of reporting patient in golden hours of chest pain, delayed thrombolyssis is due to delay for giving consent.

Results

Tables 1-9 details of patients studied.

In total, 209 patients were admitted with acute STEMI. Of these, 155 (74%) patients reported 5 am to 10 am. About 127 (61%) reported, within 3 hours of chest pain, hypertension 136 (65%), hyperlipdemia 106 (50.71%), smoking 92 (44%), DM 66 (31.55%), and positive family history of IHD 64 (30.62%). Of these STK (steptokinases) vs TNP, 18 (11.11%) vs 3 (6.38), $P > 0.36$, died during treatment (refractory cardiogenic shock, cardiac arrest 20, bleeding from chronic peptic ulcer 1). No reperfusion, that is 50% reduction in ST segment elevation at the end of 70 minutes of thrombolysis, noted in 17 (10.9%) vs 5 (10.63%), $P = 0.941$. Reinfarction within 1 hour of thrombolysis seen in 6 (2.87%). All the patients with failure of reperfusions and development of reinfarction were referred to tertiary care hospital for rescue angioplasty [Figures 1-10].

One patient had severe anaphylaxis to second dose of STK for reinfarction within 1 year of first attack of myocardial infarction was thrombolysis by full dose of STK. These cases were followed for 1 year of this STK 12 (7.4%) vs TNK 0 died ($P = 0.072$).

Hyperhomocysteinemia

Patient 1

On sixth February 2015 at 3.50 am, a 60-year-old male reported with the complained of burning sensation in chest, vomiting, and profuse sweating since 2.55 am. He was taking methotrexate 7.5 mg once in week for rheumatoid arthritis for last 2 years.

Figures 1-5.

Irrespective of regression of ST segment patient complained of severe burning sensation in the chest. We accompanied with patient to tertiary care hospital, he was immediately taken to catheter laboratory, and coronary angiography showed complete

Table 1: Age wise distribution

Age years	Steptokinase		Tenecteplase (*n*=47)		*P*
	Number	Percentage	Number	Percentage	
31-40	6	3.70	6	12.76	0.002862
41-50	21	12.96	13	27.65	
51-60	50	30.86	11	23.40	
61-70	48	29.63	14	29.78	
>70	37	22.84	3	6.38	
Total	162	100.00	47	100.00	

155 reported 4 to 11 am 54 5 to 00 pm

Table 2: Sex wise distribution

Sex	Steptokinase		Tenecteplase (*n*=47)		*P*
	Number	Percentage	Number	Percentage	
Male	129	79.63	42	89.13	0.141
Female	33	20.37	5	10.87	

Table 3: Chest pain to hospital

Within 3 h: STK 96 (59.85%) *vs.* TNK 31 (86.11%)

Time	Streptokinase (*n*=162)		Tenecteplase (*n*=47)		*P*
	Total	Percentage	Total	Percentage	
Within 1 h	32	19.75	22	46.80	0.000023
1-2 h	23	14.20	11	23.40	
2-3 h	41	25.31	8	17.02	
>3 h	66	40.74	6	12.76	

Table 4: Risk factors

Risk factor	Streptokinase (*n*=162)		Tenecteplace (*n*=47)	
	Total	Percentage	Total	Percentage
Hypertension	102	62.96	38	80.85
Diabetes mellitus	47	29.01	21	44.68
Smoking	72	44.44	20	42.53
Tobacco chewing and Masheri	84	51.85	10	21.27
hyperelpidemia	86	53.08	22	46.80
hyperhomocysteinemia	28	17.28	7	14.89
Family history of ischemic heart disease	46	28.39	19	40.42
Anemia	10	21.27	1	2.12

Table 5: Hospital to needle time in minutes

	Steptokinase (*n*=162)		Tenecteplase (*n*=47)		*P*
	Total	Percentage	Total	Percentage	
Interval in min					
10	17	10.49	9	19.14	0.121
15	36	22.22	7	14.89	
20	40	24.69	8	17.02	
25	21	12.96	2	4.25	
30	30	18.51	12	25.53	
>60	18	11.11	9	19.14	
Average hospital to needle time	10-60 (20.33)		10-120 (32.76)		

Table 6: Reperfusion

	Streptokinase (*n*=162)		Tenecteplase (*n*=47)		*P*
	Total	Percentage	Total	Percentage	
Time in min					
<60	47	29.01	21	44.68	0.075
61 to 120	88	54.32	18	38.29	
>120	20	12.35	4	8.51	
No perfusion	7	4.32	4	8.51	
Reinfarction	3	2.5	3	6.38	0.094

Table 7: The site of infarction

Site of infarction	Steptokinase	%	Tenecteplase	%	*P*
Anterior wall	92	56.79	26	54.34	0.895
Inferior wall	65	49.2	19	41.30	
True posterior	5	3.04	2	4.34	
Death	9	5.55	2	4.34	0.746

Table 8: Total M 27, F 8, age mean 61.8 (34-87) years

				Sudden deaths	
No	Name	Age	Sex	Risk factor	Symptoms
1	P	36	F	Hypertension Hypo	breathless
2	M	34	M	Obesity	Chest pain
3	Db	75	M	HTN DM	Chest pain
4	Ab	76	F	HTN	Chest pain
5	Vk	50	M	HTN DM	Chest pain dyspnea
6	Sp	75	M	HTN DM	Chest pain
7	Sj	70	M	HTN	Chest pain
8	Ag	87	M	HTN	Chest pain
9	Cm	81	M	DM HTN	Breathlessness
10	Tj	80	M	DM HTN	Chest pain
11	Gs	65	M	HTN	Chest pain
12	Ak	42	M	DM	Chest pain
13	Fk	56	F	HTN	Chest pain
14	Sg	43	M	HTN	Chest pain
15	Mk	40	M	HTN	Chest
16	Vj	38	M	Heavy work unaccustomed	Chest pain
17	Sb	75	M	HTN DM	Chest pain dyspnea
18	`jd	54	M	DM HTN	Chest pain
19	Sz	52	F	HTN	Chest pain
20	Mg	55	M	DM HTN	Chest pain dyspnea
21	Ak	75	M	HTN	Chest pain
22	Lj	81	M	HTN	Dyspnea
23	Js	50	M	HTN	Uneasiness
24	L	62	F	HTN	Chest pain
25	Dks	68	M	HTN	Chest pain
26	Dm	51	F	HTN DM	Suffocation
27	Gm	75	M	HTN	Chest pain
28	R j	58	M	HTN	Chest
29	Gs	82	M	HTN	Dyspnea
30	Ak	70	M	-	Chest pain
31	md	35	F	HTN	Chest pain
32	Ah	75	M	DM HTN	Chest pain
33	Nm	50	M	DM HTN	Chest
34	Sk	87	F	HTN	Chest pain
35	St	58	M	HTN	Chesty pain

Hypertension=19; HTN+DM=11; obesity=1; DM=1; heavy strenuous work=1; no cause=1

left main coronary obstruction. His pain and ECG changes regressed soon after angioplasty. His serum B12 was 114 pg/mL (normal 187–883), serum folic acid was 5 ng/mL (normal 3–17), and plasma homocysteine was 24.41 moll/L (normal 5.14–16.22).

Patient -2.

A 67-year-old male reported within one hour of chest pain, acute ECG changes regressed [Figure 7], repapered within 190 minutes [Figure 8], had ventricular fibrillation, resuscitated with DC shock. Undergone CABG died on 7th day.

Figures 6-8.

Nonhabitual stressful exercise

Figures 9 and 10

A 46-year-old male doctor attended the yearly gathering of his 6-year-old son. For parents, school arranged running competition of 2 km. While running, this doctor felt sudden blackout, giddiness, and profound weakness with heavy pressure on central chest. He reported within 30 minutes to hospital.

Discussion

There is no traffic jam at rural areas like that of urban. Moreover, transport facilities inform ambulance 108, autoriksha, or/and private vehicles are easily available to reach to near physician within golden hours after chest pain. At every taluka places or even a big villages, physicians and MBBS doctors with ECG machines are available. Moreover physician is aware of important of thrombolytic therapy in acute myocardial infarction. MCI should made compulsory for charged defibrillator (darling of ICU) at OPD with ECG machine, specifically those who is having ECG machine. To alleviate the golden hours mortality due to lethal ventricular arrhythmias. Even in ambulance victim can receive throbolysis, because of unavoidable delay due to traffic. Availabilty of global positing system (GPS) can easily detect the one way traffic Jam.

Acute STEMI is a dynamic, thrombus-driven event. Farming is main occupation of villagers, with low per-capita income. Many time chest pain victims are neglected; 35 patients were brought dead [Table 8]. For patients in rural or semirural areas, who delay contacting emergency services, achievement of total time from chest pain onset to per-cutaneous coronary intervention recommended by guidelines 180 minutes is impossible.[19,20] Villagers are poor and not prepared for expensive treatment like tenecteplase and PAMI though the cardiac catheter laboratory at taluka place is available. Hope "Pradhan Mantri Jan Arogya Yojana" may break this barrier. Management of acute myocardial infarction involves a complex interplay between rapid restoration of epicardial and microvascular blood flow by pharmacological and cathter-based means, suppression of recurrent ischemic events through optimized antithoambotic therapies and blunting the effect of myonecrosis and preventing future events. Rapid

Table 9: Effects of thrombolytic - arrhythmias

	Steptokinase (*n*=162)		Tenecteplase (*n*=47)		*P*
	Total	Percentage	Total	Percentage	
Arrhythmias					
Ventricular pre mature contraction	85	52.46	35	74.46	0.0094
Atrial premature contraction	5	3.08	7	14.89	0.0074
Ventricular tachycardia	6	3.70	3	6.38	0.407
Ventricular fibrillation	5	3.08	5	10.63	0.029
Atrial fibrillation	2	1.23	0	0	0.448
Bradycardia	32	19.75	9	19.14	0.977
Tachycardia	15	9.25	5	10.63	0.743
Heart blocks	15	9.25	1	2.12	0.111
AIVR	27	16.66	8	17.02	0.907
Hypotension	34	20.98	8	17.02	0.591
Gum bleed	15	9.25	3	6.38	0.283
Fatal during treatment	18	11.11	3	6.38	0.361
At 1 year	12	7.4	0	0	0.072

thrombolytic therapy remains the principal treatment to improve survival after STEMI.

Cost is the restriction for use of tenecteplase though it is easy to administer, achieve greater vessels patency and free from anaphylaxis less systemic bleeding than streptokinase. Out of 209 STMI patients, only 47 (22%) could afford TNP. In present data, acute bleeding STK vs TNP is 15 (9.2%) versus 4 (8.5%); $P = 0.0.283$ is not significant.[21] While 1 year, mortality in STK group is 7.4% as compared with TNP with no fatality $P = 0.072$. Because of cut throat competition in urban areas and, mushrooming of physicians, physicians are happy to work and stay at rural setting, moreover, they are trained regarding important of early thrombolysis, which prevent the irreversible myocardial damage and subsequent left ventricular dysfunction and reduction in mortality, this is confirmed in present report with reduction in one year fatality, and important role preintensive care thrombolysis.[22,23] 30 days survival is more in a patient received prehospital thrombolysis as compared with primary angioplasty.[24] In present report, 30 days fatality is zero [STK 148 and TNP 44). At rural setting with restricted resources thrombolysis is simple, easy, and can be quickly implemented than primary PCI. The benefit of primary PCI over thrombolysis is dependent on efficient and effective clinical system that is able to deliver timely and consistent reperfusion.

Villagers are much aware of chest pain because of their previous experience regarding sudden death preceded by chest pain [Table 8]. About 137 (66%) patients reported within 3 hours of chest pain, in these patients reperfusion treatment for STEMI was most beneficial.[15] In this study, hospital to needle time is <26 minute that result in rapid thrombolysis with reperfusion assessed by resolution of 50% ST segment noted in 166 (79.42%) patients. Failed reperfusion in 43 (20.5%) is much better compared with 40% in thrombolysis and 25% in PCI.[25,26] Six patients with reinfraction due to failed thrombolysis undergone rescue angioplasty at tertiary care hospital (210 km away from Mahad), because PCI for reinfarction after thrombolysis is also better than readministration of thrombolysis.[27] In India, because of commercialization and cut throat competitions among cardiologists and tertiary care hospitals, mushrooming in cosmopolitical cities like Pune, Mumbai, Chennai, and Calcutta, routine emergent PCI done after thrombolysis without ongoing evidence of failed reperfusion or facilitated PCI has not been associated with benefits.[28] This facilitated PCI may result in composite of death, heart failure, and shock as compared with primary PCI.[29] However, routine PCI after thrombolysis within 24 hours could consolidate the benefits of successful reperfusion.[30] Early thrombolysis and PCI within 24 hours achieved similar outcomes to PCI alone.[31] Medical management is recommended treatment for patients with occluded infarct-related arteries 24 hours after symptoms onset who are free of ongoing ischemia.

Dose of aspirin 150–300 mg[32,33] and clopidogrel 600 mg loading dose[34] achieved improved rates of vessel patency. Higher loading dose of clopidogrel 600 mg has been shown to achieve more rapid platelets inhibition.[35] Pasugrel has been shown to be better than clopidogrel, but it may cause major bleeding. Increasing the numbers of patients treated with reperfusion therapy.

Thus, thrombolysis still have a role in the management of patient with STEMI and restoration of as normal culprit arterial flow as possible. Thrombolysis is the only therapy for STEMI possible at rural setting.

In this study, median time for onset of chest pain to thrombolysis was 1 hour and 40 minutes as compared with 2.5 hours in a "fast track" patients report.[36] Benefit of thrombolysis seemed to be time dependent, with little advantage compared with control after 6 hours; however, subsequently this time window could be extended to 12 hours but no longer.[37] To achieve timely thrombolysis and reporting cases to hospital within golden hours, India must established networks for delivery. REACT trial[28] showed the usefulness of a strategy in which thrombolytic

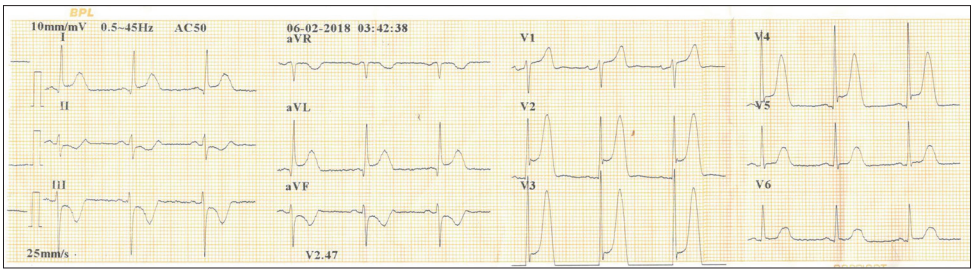

Figure 1: On 2.55 am showed hyper-acute T waves V1 toV4 with reciprocal ST segment depression and T wave inversion in lead II, III, AVF. From local hospital

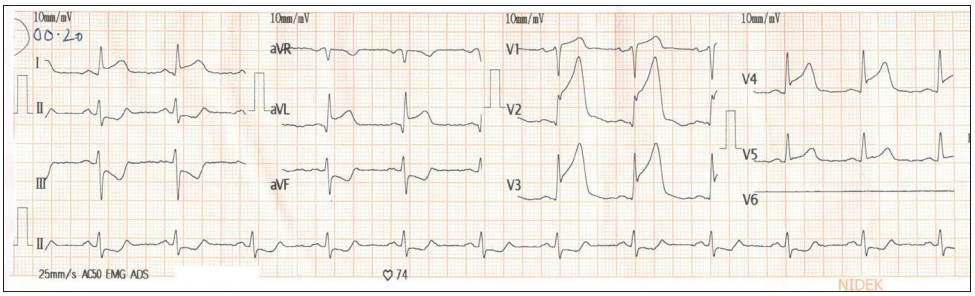

Figure 2: On arrival to hospital at 20 minutes of hospitalization showed ST segment elevated in lead 1, AVL and V2 to V4

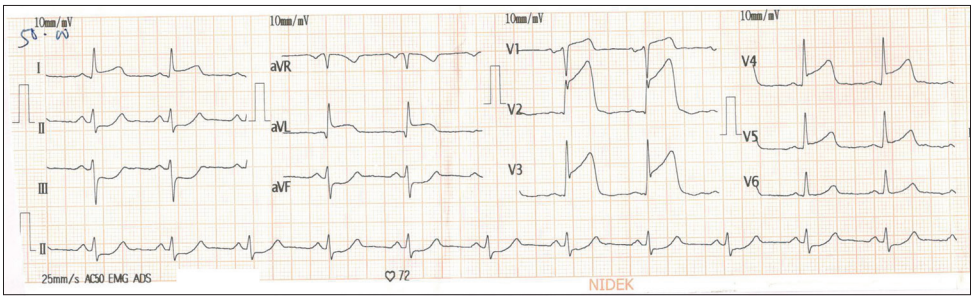

Figure 3: Postthrombolytic with intravenous bolus of tenecteplase. There is 20% reduction in ST segment elevation

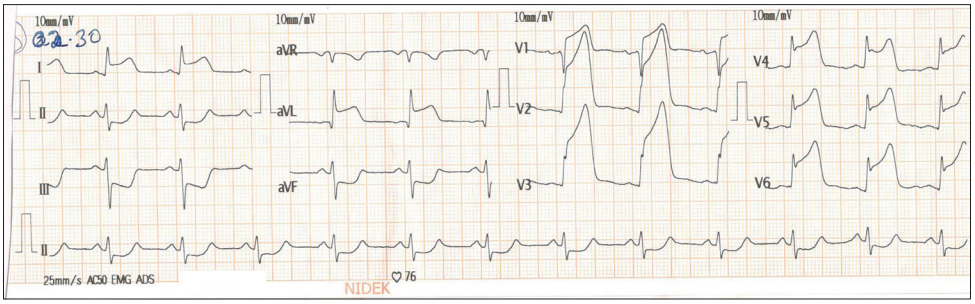

Figure 4: Recurrent chest pain with recurrence of extensive anterior wall myocardial infarction

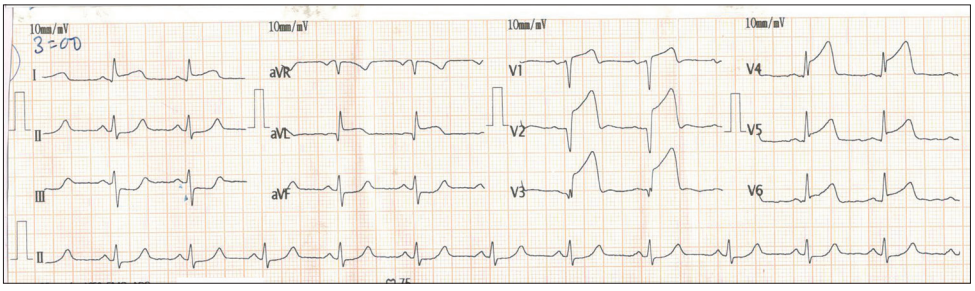

Figure 5: On 2.55 am regression of acute injury pattern

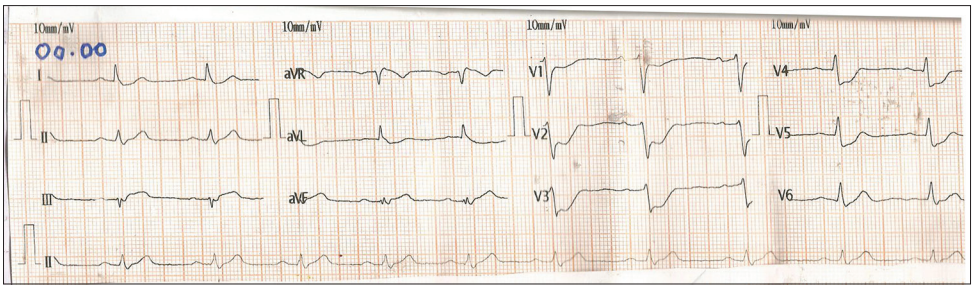

Figure 6: 00-on arrival showed ST segment elevation in lead III and AVF, and AVR. ST segment depression with loss of r waves V1-V3. True posterior myocardial infarction poor progression of R waves. He was given 40 mg of tenecteplase by intravenous bolus

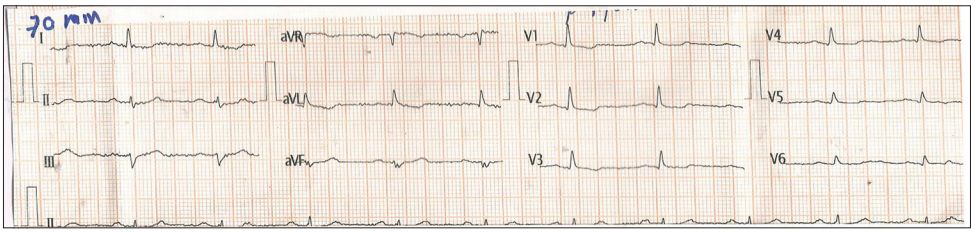

Figure 7: ECG 70 minutes. No chest pain. Showed regression of ST segment elevation with R wave in V1

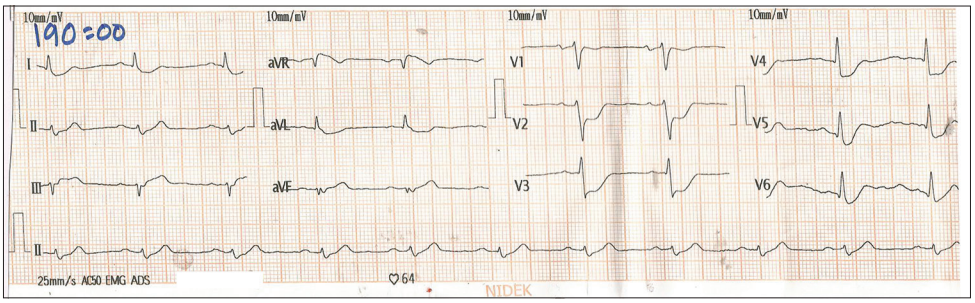

Figure 8: ECG 190 minutes. Patient complained of chest pain. ECG showed recurrence of acute ST –changes similar to on arrival. He had repeated ventricular fibrillation was treated with DC shock. Undergone angiography showed three vessels disease, undergone coronary artery bypass surgery and died on seventh day due to cardio-respiratory failure

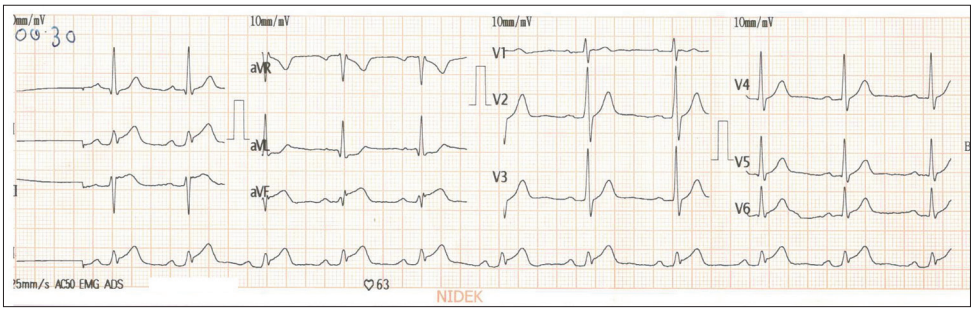

Figure 9: On 2.55 am showed ST segment elevation in lead II,III,AVF

success was established by recording on an ECG 90 minutes after reperfusion therapy, with rescue angioplasty done then if needed, wherease the GRACIA 1 study[30] also suggested that angiography within 24 hours of successful thrombolysis was beneficial. Thus, early thrombolysis followed by rapid transfer to a PCI capable hospital rescue angioplasty, if thrombolysis is unsuccessful and coronary angiography only in patients with successful thrombolysis after 4 h but before 24 h. STREAM trial showed that >705 of patient receiving thrombolysis within golden hours had TIMI flow grades of 2 and 3, compared with 20% with those arriving for PCI.[18] Because of restricted resources, we avoided prasugrel to avoid major bleeding and fatal bleeding were significantly higher in prasugrel group.[38]

Administration of thrombolytic treatment at peripheral hospital or if possible at home as earlier treatment saves more lives.[39] Though villagers afraid of chest pain as their previous experience or news that sudden death is common preceded by chest pain.

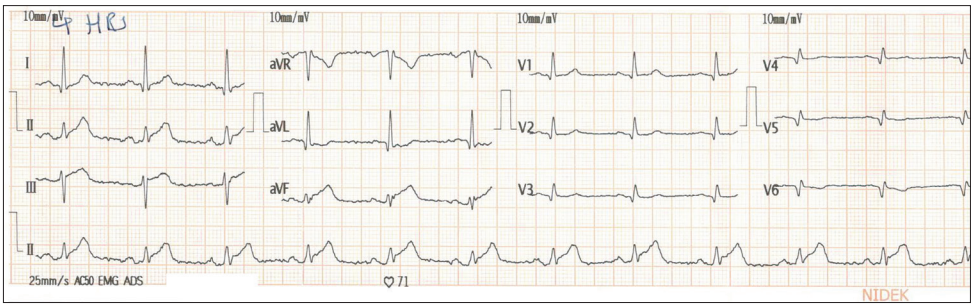

Figure 10: ECG 2 at the four hours of hospitalization, showed regression of ST segment. He underwent angiography showed right coronary plaque with thrombus occluding the artery

Hence, chest pain patient report within golden hours. However, they are not prepared for expensive tenecteplase and even STK. Earlier just asking for payment of streptokinase, relative avoid hospitalization, and many times died at home or attend mantrik or tantric. To avoid this, we purchased two vials of STK and 2 vials of TNP and kept ready for STEMI patient without any pre or advanced payment. Though the management of STEMI has evolved substantially over the past five decade, still at rural setting, soon after relief of chest pain, relative take discharge at request or goes against medical advice. Now because of no advance payment and long-term result of thrombolysis that final infarct size is an especially strong predictor of functional recovery and long-term outcome. We succeed in hospitalization and thrombolysis almost all STMI patients. Development of health system and increases in universal access to care are essential to reduce premature death from CVS causes. Innovation of simple and cost-effective measures would increase rates of diagnosis and treatment.

In this report, STK is noninferior against TNP. STK required 1 hour infusion, not free from anaphylaxis and transient bleeding which can be easy to note by repeated examination of oral cavity for any active bleed, it is indicator to stop the infusion as fibrinolysis occurred and aim of thrombolytic achieved, this approach at our hospital prevented massive bleeding and death in 15 cases with active bleed during treatment.

STK is poor man thrombolytic agent, whereas TNP is rich man thrombolytic agent, because it is free from anaphylaxis and administered in bolus. Treating physician is more comfortable with TNK. More over the treating physician get $87.71 commission per vial of TNP.[40,41] Majority of poor patients attend tertiary care government hospital that only afford STK. Cardiologists should take pride in their profession's achievements but must work to make sure the benefits are available to poor population of rural areas.[42] Early patient presentation, rapid diagnosis, and early reperfusion in patients presenting with acute chest pain constitute the pillars of success in STEMI management.

Time is a crucial factor in STEMI care; "time is myocardium" is a familiar adage. Still streptokinase, aspirin and clopidogrel are the poor man thrombolytic drugs, easily available to treating physician and is cost effective. Tenecteplase is administered by intravenous bolus, it is free from anaphylaxis, can be administered in cardiogenic shock or hypotension by peripheral physician provided contraindications are ruled out.

It surprise to note even at super specialist cardiac center, these victims are not investigated for risk factors like homocysteine and rarely council for other risk factors. Treating cardiologist felt that only revascularization by PAMI or routine angioplasty is his job and rest of thing are left to be trained of Untrained staff. Moreover there is no time left for taking reliable medical history. Depression and cardiac psychosis often over looked. One should treat patient as a whole and not the heart only. Now it is high time to revive dying clinical medicine or by attending routine ward medical round with residents. Irrespective of cardiac catheter lab at public health tertiary care hospital acute myocardial infarction is treated by thrombolytic agent and not the PAMI because of lack of infrastructure and preparation of laboratory for emergency PAMI.

Today India is becoming a capital of noninfectious diseases like hypertension, IHD, and DM; in such situation, prevention is mother of cure. Still yet we have to witness a preventive cardiology clinic in India. Rather than to declare benefits for the treatment of disease by the government.

Conclusion

Development of clinical networks designed to enable peripheral hospital thrombolysis could provide further mortality benefits to a broader population patients presenting with STEMI. In a situation like that at Mahad, early thrombolysis by STK followed by angiography/PCI at tertiary care hospital has favorable result.

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Conflicts of interest

There are no conflicts of interest.

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