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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/11400

DOI URL: <http://dx.doi.org/10.21474/IJAR01/11400>



RESEARCH ARTICLE

AUDIT OF PRIMARY PCI IN AN INDIAN TERTIARY CARE CENTER

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Manuscript Info

Manuscript History

Received: 25 May 2020

Final Accepted: 28 June 2020

Published: July 2020

Abstract

Our audit titled "Primary Percutaneous Coronary Intervention in an Indian Tertiary Care Centre" was conducted to assess the time taken for primary PCI for the patients presenting with chest pain to our hospital. The study was conducted in a tertiary care centre "Peerless Hospital and B.K.Roy research centre" Kolkata, India. The sample size for the audit is 72. The study was conducted over a period of 1 year. According to European Society of Cardiology 2017 STEMI guidelines, maximum time from STEMI diagnosis to primary PCI in patients presenting to tertiary care centre should be within 60 minutes (1 hour) and delay accepted till 120 minutes (2 hours). From the above study period of 1 year, 29% of the patients have presented within 6 hours of onset of symptoms and 71% of patients presented after 6 hours. With this guideline reference, in our audit, we found that 21% of patients were sent for PCI within 120 minutes from the time of diagnosis and 59% were sent within 6 hours. Delay of PCI in some patients was due to patient attendants taking more time to admit the patients. Quick counselling of PCI patients/attendants to be done once PCI is planned to avoid delay. The EMS should be taught to diagnose STEMI before arrival to the hospital and so the time delay can be reduced. Awareness programs should be conducted regarding the early intervention strategy for cardiac patients in the community, which will decrease the arrival time to hospital.

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Introduction:-

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Table 5 Summary of important time targets

Intervals	Time targets
Maximum time from FMC to ECG and diagnosis ^a	≤10 min
Maximum expected delay from STEMI diagnosis to primary PCI (wire crossing) to choose primary PCI strategy over fibrinolysis (if this target time cannot be met, consider fibrinolysis)	≤120 min
Maximum time from STEMI diagnosis to wire crossing in patients presenting at primary PCI hospitals	≤60 min
Maximum time from STEMI diagnosis to wire crossing in transferred patients	≤90 min
Maximum time from STEMI diagnosis to bolus or infusion start of fibrinolysis in patients unable to meet primary PCI target times	≤10 min
Time delay from start of fibrinolysis to evaluation of its efficacy (success or failure)	60–90 min
Time delay from start of fibrinolysis to angiography (if fibrinolysis is successful)	2–24 hours

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ECG = electrocardiogram; FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction

^aECG should be interpreted immediately.

2017 Stemi Guidelines

CHANGE IN RECOMMENDATIONS 2012

Radial access^a
MATRIX¹¹⁰

DES over BMS
EXAMINATION^{115,116}, COMFORTABLE-AMI¹¹⁰, NORSTENT¹¹²

Complete Revascularization^b
PRAISE¹¹⁸, DANAMI-3-PRIMULTI¹¹⁹, CVLPRIT¹²⁰, Compare-Acute¹²¹

Thrombus Aspiration^c
TOTAL¹²¹, TASTE¹²²

Bivalirudin
MATRIX¹⁰⁸, HEAT-PPCI¹⁰⁶

Enoxaparin
ATOLL^{120,121}, Meta-analysis¹⁰²

Early Hospital Discharge^d
Small trials & observational data¹²³⁻¹²⁵

Oxygen when SaO₂ <95%
AVOID¹²⁶, DETOX¹²⁶

Oxygen when SaO₂ <90%

Dose i.V. TNK-tPA same in all patients
STREAM¹²¹

Dose i.V. TNK-tPA half in Pts ≥75 years

2017 NEW RECOMMENDATIONS

- Additional lipid lowering therapy if LDL >1.8 mmol/L (70 mg/dL) despite on maximum tolerated statins
IMPROVE-IT¹²⁷, FOURIER¹²⁸
- Complete revascularization during index primary PCI in STEMI patients in shock
Expert opinion
- Cangrelor if P2Y₁₂ inhibitors have not been given
CHAMPION¹²⁹
- Switch to potent P2Y₁₂ inhibitors 48 hours after fibrinolysis
Expert opinion
- Extend Ticagrelor up to 36 months in high-risk patients
PEGASUS-TIMI 54¹³⁰
- Use of polyfill to increase adherence
FOCUS¹³¹
- Routine use of deferred stenting
DANAMI 3-DEFER¹³²

I

IIa

IIb

III

2017 NEW / REVISED CONCEPTS

MINOCA AND QUALITY INDICATORS:
• New chapters dedicated to these topics.

STRATEGY SELECTION AND TIME DELAYS:
• Clear definition of first medical contact (FMC).
• Definition of "time 0" to choose reperfusion strategy (i.e. the strategy clock starts at the time of "STEMI diagnosis").
• Selection of PCI over fibrinolysis: when anticipated delay from "STEMI diagnosis" to wire crossing is ≤120 min.
• Maximum delay time from "STEMI diagnosis" to bolus of fibrinolysis agent is set in 10 min.
• "Door-to-Balloon" term eliminated from guidelines.

TIME LIMITS FOR ROUTINE OPENING OF AN IRA^a:
• 0–12h (Class I); 12–48h (Class IIa); >48h (Class III).

ELECTROCARDIOGRAM AT PRESENTATION:
• Left and right bundle branch block considered equal for recommending urgent angiography if ischemic symptoms.

TIME TO ANGIOGRAPHY AFTER FIBRINOLYSIS:
• Timeframe is set in 2–24h after successful fibrinolysis.

PATIENTS TAKING ANTICOAGULANTS:
• Acute and chronic management presented.

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Figure 1 What is new in 2017 STEMI Guidelines. BMS = bare metal stent; DES = drug eluting stent; IRA = infarct related artery; iv. = intravenous; LDL = low-density lipoprotein; PCI = percutaneous coronary intervention; SaO₂ = arterial oxygen saturation; STEMI = ST-elevation myocardial infarction; TNK-tPA = Tenecteplase tissue plasminogen activator. For explanation of trial names, see list of.

^aOnly for experienced radial operators.

^bBefore hospital discharge (either immediate or staged).

^cRoutine thrombus aspiration (bailout in certain cases may be considered).

^dIn 2012 early discharge was considered after 72h, in 2017 early discharge is 48–72h.

^eIf symptoms or haemodynamic instability IRA should be opened regardless time from symptoms onset.

In left and mid panels, below each recommendation, the most representative trial (acronym and reference) driving the indication is mentioned.

Data Study Period:

January 2017 – December 2017

Total Population:

72

Inclusion Criteria:

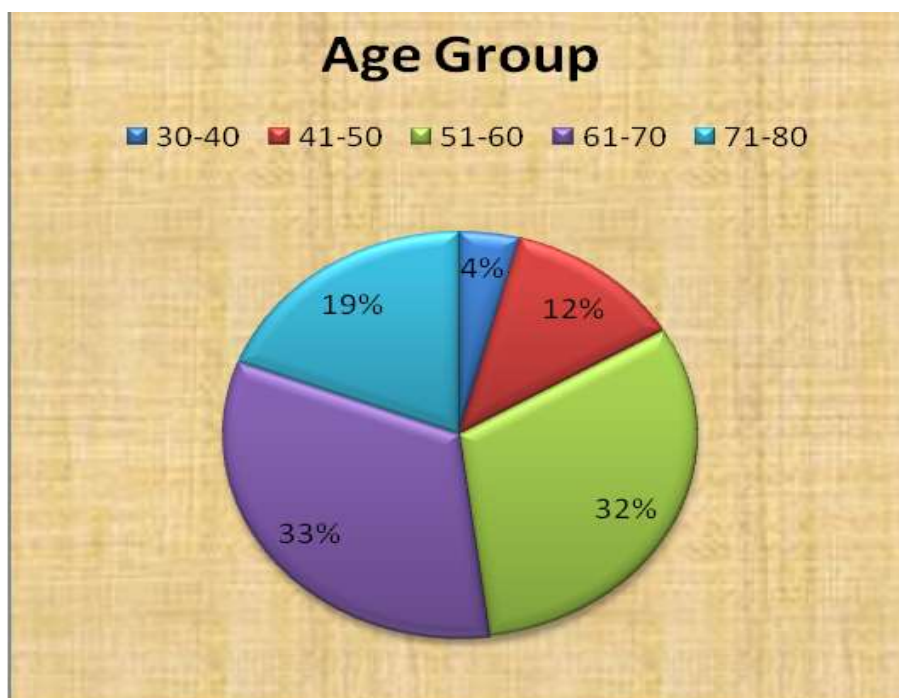
Age group 30-80 years, Coronary Angiography done outside without any intervention in patients presenting <96hours.

Exclusion Criteria:

Age group <30 years, received prior fibrinolytic agent, presentation to the hospital >96hours of symptom onset.

Study Site:

Peerless Hospital and B.K.Roy research centre, Kolkata, India.



Age Group:

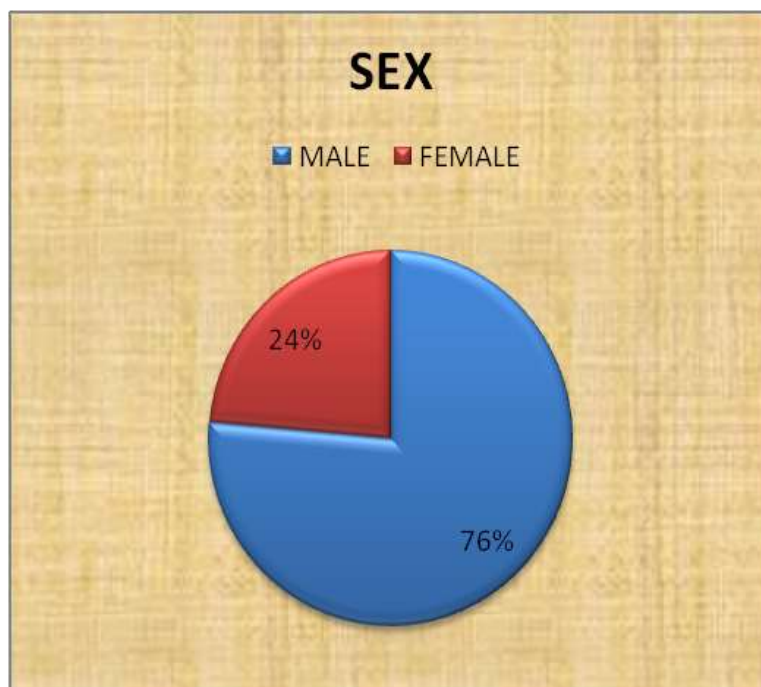
30-40 – 4%

41-50 – 12%

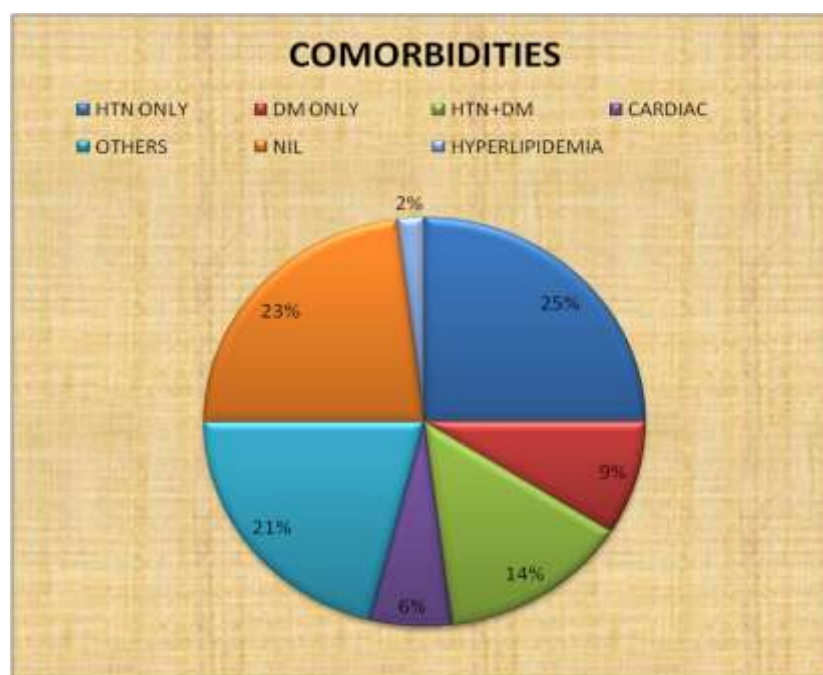
51-60 -- 32%

61-70 – 33%

71-80 – 19%

**SEX:**

Male – 76%
Female – 24%

**Comorbidities:**

Hypertension – 25%
Diabetes – 9%
Hypertension and
diabetes – 14%
Previous cardiac – 6%
Others – 21%
Hyperlipidemia – 2%

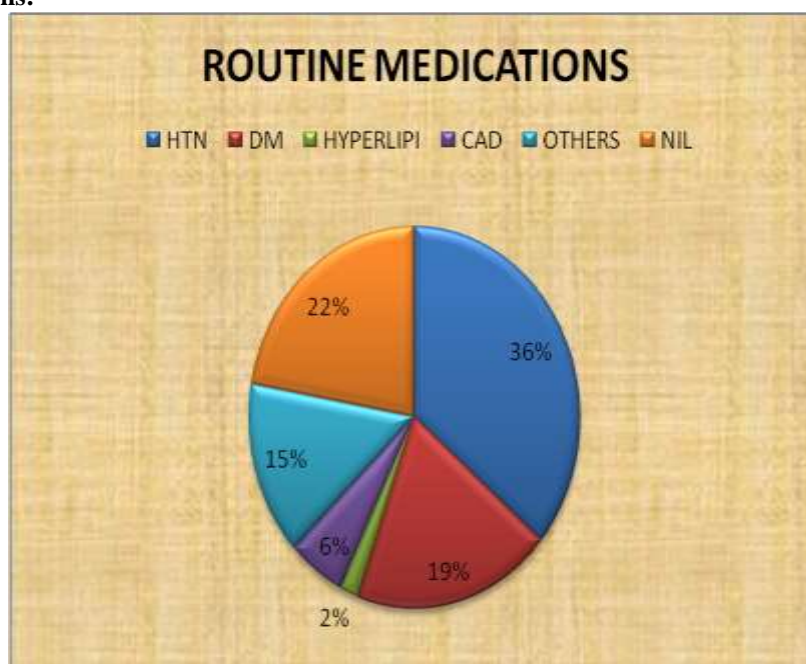
Nil – 23%

Chest pain to hospital arrival:



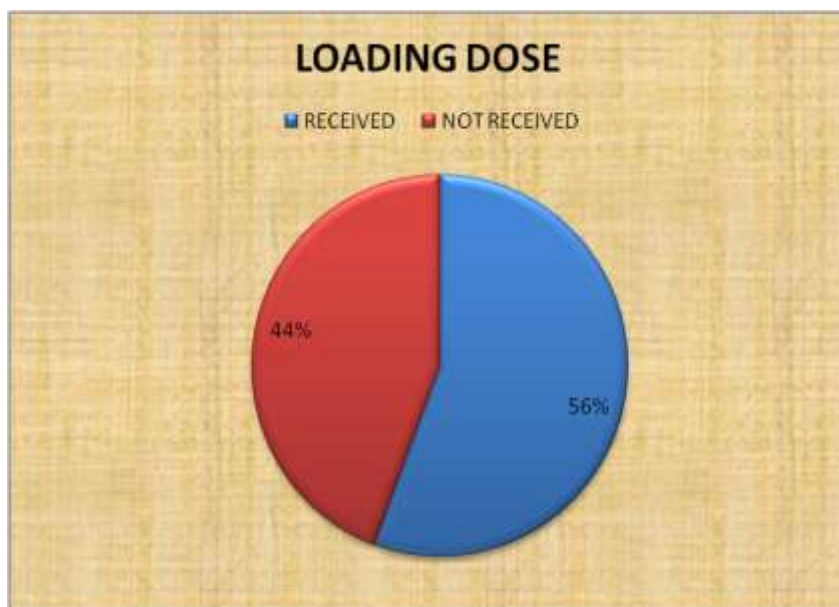
1 – 2 hours – 9%
 2 – 6 hours – 20%
 6 – 12 hours – 26%
 12 – 24 hours – 8%
 24 – 48 hours – 8%
 48 – 72 hours – 7%
 > 72 hours – 14%
 No chest pain – 8%

Routine Medications:

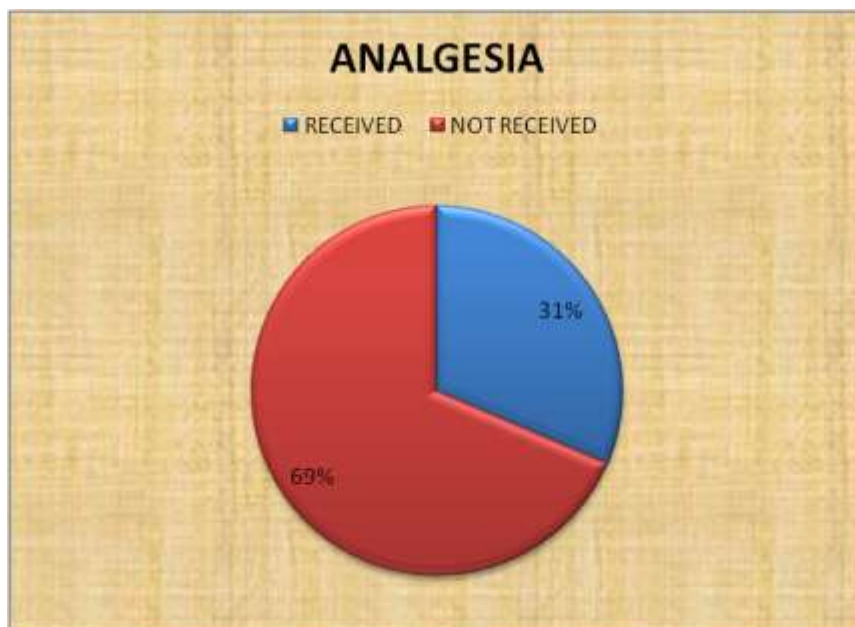


Hypertension – 36%

Diabetes – 19%
Hyperlipidemia – 2%
Previous cardiac
disorder – 6%
Others—15%
Nil – 22%



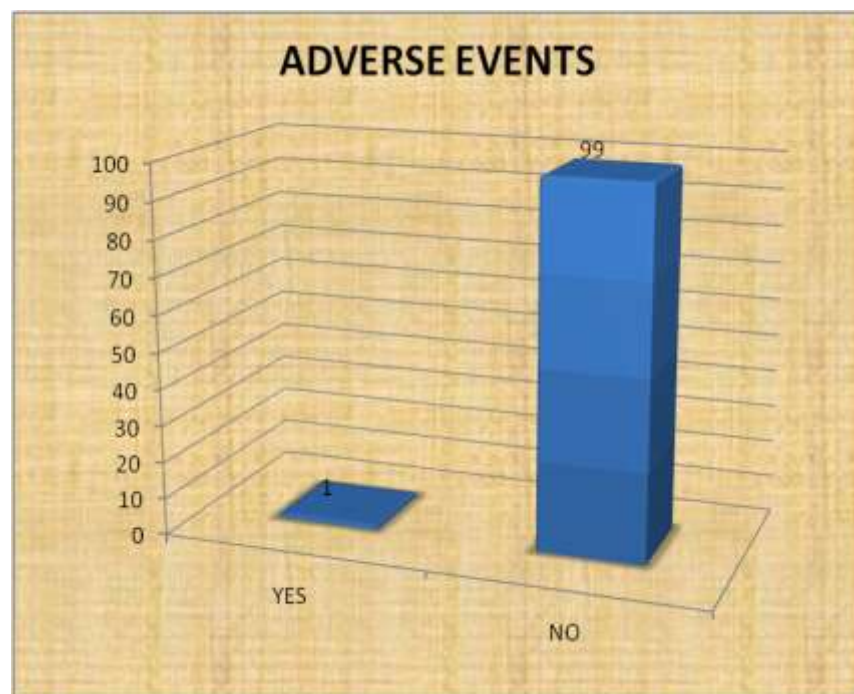
Loading Dose:
Received – 56%
Not received -- 44%



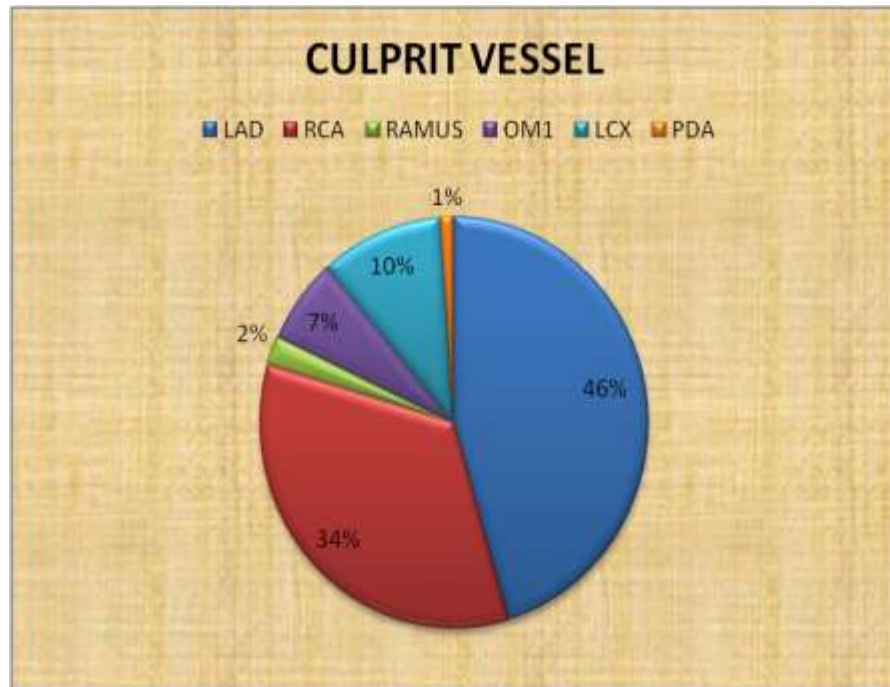
Analgesia:
Received – 31%
Not received – 69%
Door to balloon time:



<2 hours – 21%
2 – 6 hours – 38%
6 – 12 hours – 11%
12 – 24 hours – 6%
24 – 48 hours – 11%
48 – 72 hours – 5%
>72 hours – 8%



Adverse events:
Nil – 99%
Eventful – 1%

**Culprit vessel:**

LAD – 46%
 RCA – 34%
 LCX – 10%
 OM1 – 7%
 RAMUS – 2%
 PDA – 1%

Conclusion:-

From the above study period of 1 year, 29% of the patients have presented within 6 hours of onset of symptoms and 71% of patients presented after 6 hours.

Among all the patients, 21% of patients were sent for PCI within 120minutes from the time of diagnosis and 59% were sent within 6hours.

99% of all patients treated with PCI had no adverse events post procedure.

Recommendations:-

Delay of PCI in some patients was due to patient attendants taking more time to admit the patients. Quick counselling of PCI patients/attendants to be done once PCI is planned to avoid delays.

The EMS should be taught to diagnose STEMI before arrival to the hospital, so the time delay can be reduced.

Awareness programs should be conducted regarding the early intervention strategy for cardiac patients in the community, which will decrease the arrival time to the hospital.

We thank our Head of Department, Dr. Indraneel Dasgupta and our academic director, Dr. Subhrojyoti Bhowmick for encouraging and supporting us throughout the audit.

We would also like to thank the Quality department and the Medical Record department who helped us with the data collection.