ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 08 | August - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

"ASSESSMENT OF RIGHT VENTRICULAR FUNCTION BY ECHOCARDIOGRAPHY IN PATIENTS WITH INFERIOR WALL MYOCARDIAL INFARCTION"

Cardiology

Dr. Krishna Kartik Reddy B Assistant Professor

Dr Satish Reddy N Assistant Professor

Dr N Reddy Rajasekhar Reddy Assistant Professor

Dr. Badada Phaniraja Rao Post Graduate

KEYWORDS

INTRODUCTION:

Inferior wall myocardial infarction is complicated by right ventricular infarction (RVMI) in as much as 10-50% of cases. In a series by Anderson et al in 1989, the incidence of RVMI in patients with inferior wall myocardial infarction was between 10 – 50%. Although right ventricular infarction is clinically evident in a sizable number of cases, the incidence is considerably less than that found at autopsy[1]. Additionally, right ventricular dysfunction and stunning frequently is of a transient nature, such that estimation of its true incidence is even more difficult. Interest in recognizing right ventricular infarction non-invasively has grown because of the therapeutic implications of distinguishing patients with right ventricular dysfunction from those without[4]. Echocardiography remains the first line investigation because of its ability to provide comprehensive information on right ventricular size, structure and function. Recent developments in ultrasound technology have overcome the limitations of simple M-mode and two-dimensional imaging and facilitated more accurate monitoring of disease progression.

Aims And Objectives Of The Study:

- To compare various echo methodologies in assessing right ventricular function in the setting of inferior wall myocardial infarction with and without right ventricular involvement.
- To assess RV function by echocardiography done at different time intervals after the onset of myocardial infarction.
- To compare RV function in patients who are thrombolysed & those not thrombolysed.
- To assess occult RV dysfunction by echocardiography in patients without right ventricular myocardial infarction on ECG.

Inclusion Criteria:

- IWMI with and without RVMI on ECG.
- First MI (MI diagnosed by history, ECG & enzymes).
- Within 48 hours of onset of chest pain.
- Any age group.
- Both sexes.
- Both thrombolysed & not thrombolysed patients.

Exclusion Criteria:

- COPD/PPH/Corpulmonale patients.
- Known Valvular heart disease/congenital heart disease.
- Previous MI.
- Presence of complete heart block, arrhythmias during echo.
- Dilated cardiomyopathy/left heart failure of any cause.
- Technically inadequate echo.

Table 1: Patients' Clinical Baseline Profile

Clinical parameters	Group 1 (n=44)	Group 2 (n=60)
Average age (yrs)	54 ± 11.3	51 ± 10.5
Systolic BP (mmHg)	108 ± 14	114 ± 12
Diastolic BP (mmHg)	74 ± 8	76 ± 10
Heart rate (per min)	70.1±7.4	68.3 ± 8.4
Thrombolysis with STK	30	42
CK-MB values	115 ± 40	75 ± 26

Table 2: Values Of Various Echocardiographic Parameters In Patients Presenting With IWMI With Or Without RVMI

Parameters	Group 1 (n=44)	Group 2 (n=60)
• RV EDD (mm)	• 21.8 ± 4.1	• 11.3 ± 3
• RV contraction abnormalities	• 18/44 (41%)	• 2/60 (3%)
• IVS motion abnormality	• 15/44 (31%)	• 1/60 (2%)
• Tricuspid regurgitation	• 21/44 (48%)	• 6/60 (10%)
• PASP (mmHg)	• 31.8±2.7	• 17.1 ± 2.8
• TAPSE (mm)	• 14.1 ± 1.2	• 18.2 ±0.71
• MPI	• 0.44 ± 0.07	• 0.28 ± 0.02
• TDI – RV Free wall Sm (cm/sec)	• 9.45 ± 0.49	• 12.1 ± 0.52
Em	• 6.8 ± 0.34	• 8.3 ± 0.65
Am	• 7.4 ± 0.67	• 9.4 ± 0.65
• TDI – Septal wall (cm/sec) Sm	• 6.3 ± 0.5	• 6.2 ± 0.5

DISCUSSION:

In this observational study conducted on 104 patients admitted to a tertiary care hospital, various echocardiographic modalities for right ventricular function are assessed.

- Observations showed 42% had RVMI.
- Mean patients age was 52.3 years with M:F of 3:1.
- 38% patients had Hypertension and 46% had Diabetes.
- Complications like conduction disturbances, cardiogenic shock, death are observed more in patients with RVMI compared to those without RVMI.
- RV end diastolic diameters, RV contraction abnormalities, Pulmonary artery pressures are more in patients with RVMI.
- Thrombolysed patients have better outcomes compared to non thrombolysed patients.
- On tissue doppler imaging, right ventricular free wall Sm and Em in patients with RVMI was less compared to patients without RVMI.
- Right ventricular free wall late diastolic velocity and septal velocities did not correlate well with RV dysfunction.
- Right ventricular myocardial performance index (Tei index) correlated with RV dysfunction and attained statistical significance.
- Increased MPI values were also associated with higher mortality.
- Thrombolysed patients had lower Myocardial performance index values, compared to those who were not thrombolysed.
- Age and sex did not significantly correlate with right ventricular function after a myocardial infarction.

CONCLUSIONS:

- Echo can identify right ventricular dysfunction in patients who have no or doubtful findings of RVMI on ECG.
- Right ventricular dimension & regional wall motion abnormalities were insignificant in detecting RVMI.

Limitations Of The Study:

1. Analysis of LV MPI was not part of our study. This may also significantly contribute to overall hemodynamics in RV MPI assessment in RVMI.
2. Myocardial velocities obtained by TDI in the apical 4 chamber reflect the movements of the myocardium only along the long axis. The contraction of the ventricular circumferential fibers does affect the TDI.
3. Even though echocardiography was performed within the first 48 hours after IWMI, it is possible that some patients may have already recovered from the damage in the right ventricle.
4. Magnetic resonance imaging which is the gold standard for right ventricular function was not done in our cases, due to financial constraints.

REFERENCES:

1. Bates ER, Clemmensen PM, Califf et al. Precordial ST segment depression predicts a worse prognosis in inferior infarction despite reperfusion therapy. J Am Coll Cardiology 1990;16:1538-1544.
2. Cohn JN, Guiha NH, Broder MI et al. Right ventricular infarction: clinical and hemodynamic features. Am J Cardiol 1974;33:209-214.
3. Nasmith J, Marpole et al. Clinical outcomes after inferior myocardial infarction. Ann Intern Med 1982;96:22-26.
4. Radford MJ, Johnson RA, Daggett WM, Jr et al. Ventricular septal rupture: a review of clinical and physiologic features and an analysis of survival. Circulation 1981; 64**:**545-553.
5. Bommer W, Weinert L, Neumann A, Neef J, Mason DT, DeMaria A. Determination of right atrial and right ventricular size by two-dimensional echocardiography. Circulation 1979; 60**:** 91–100.
6. Kaul S, Tei C, Hopkins JM, Shah PM. Assessment of right ventricular function using two dimensional echocardiography. Am Heart J 1984; 107: 526–531.
7. Levine RA, Gibson TC, Aretz T et al. Echocardiographic measurement of right ventricular volume. Circulation 1984;69**:** 497–505.