Material and Methods
MATERIAL AND METHODS

The present study was evaluated in the Department of Medicine, M.L.B. Medical College, Jhansi over a period of one year. The patients were taken from ICCU cardiology ward and cardiology OPD. This study was aimed to detect systolic and diastolic function abnormalities in patient of coronary artery disease by echocardiography.

Criteria for diagnosis of coronary artery disease was:

1) Symptoms suggestive of ischemic heart disease.

2) ECG changes suggestive of myocardial ischemia or infarction.

3) Myocardial infarction was suspected clinically and confirmed by ECG changes or and qualitative estimation of Trop-T. Echocardiography was done with HP-Sonos-2000 which was kept in fully air conditioned room to maintain temperature and humidity for optimal functioning of the machine. It has following modality of echocardiography:

1) 2-D echocardiography

2) M-mode echocardiography
3) Colour doppler eachocardiography

4) Pulse wave and continous wave echocardiography.

**HP-sonos-2000 has following parts:**

M2406A HP SONOS Imaging platforms includes: Quick touch interface, IGC definition CFI Doppler with HPRPF M-Modes, S-VHS, ECG, HP colorization and calculation package.

OPTION A01 HP SONOS 2000- Imaging system (incorporated with opt A04) includes: Dynamic elevation beam forming CV application, vascular improvement Pkg, non-imaging doppler probe.

OPTION C01- Adds continuous loop Review capability to the SONOS 2000 platform for full split and quad screen image and review and editing.

OPTION D01-

- 2.5/2 OMHz Transducer Model 21215A
- 2.5/2 OMHz transducer with dynamic elevation beamforming. Dual frequency agility and streerable PW/CW doppler capabilities.

OPTION D30
7.5/5.5 OMHz Transducer Model 21275A

7.5/5.5 MHz dual frequency agility imaging transducer with steerable PW/CS doppler capability.

OPTION C53-

Sony small format color printer internally mounted. Sony small format colour printer and mounting hardware and cables.

OPTION ACJ-

India- English localization provided appropriate power and video format configuration for India with english documentation and displays.

Source of patients

Subject for echocardiography were selected from cardiology OPD and those admitted in Intensive coronary care unit and wards.

A complete medical history was recorded including definite postal address, Phone No. if any.

A complete history of patients including risk factors like smoking, past history of DM, HT, CRF or other chronic disease etc. was taken. A complete examination of
cardiovascular & other systems was done. Patients selected for study were investigated as follows:

1) **Routine Investigations**

   Complete hemogram
   Blood Sugar (Fasting and PP)
   Blood Urea & S. Creatinine
   Lipid Profile (12-14 hrs fasting)
   Urine – R/M

2) **Special Investigations**

   Creatinine phosphokinase (CPK-MB)
   Serum aspartate transaminase (AST)
   Resting 12 leads standard ECG
   X-ray chest PA view (in deep inspiration)
   Trop-T Test
   Holter monitoring
WORKING PROFORMA

MRD No. .......... .......... Date of admission: ..........

Name: .. .......... A/S: ..................................

Address: .. ........ Religion: ..........................

Occupation: .. .......... Education: .......... ..........

Socio-economic status: .......... Residence U/R: ............

Martial Status: ..........................

Coronary risk factors:

Smoking: .......... Duration/Quantity ............

Diabetes: .......... Duration ............

High B.P. .......... Duration

Obesity

Elevated S. Cholesterol

Sedentary habit

Stress

Chief complains

Present History
Past history

General Examinations

GC  Pallor
PR  Cynosis
RR  Icterus
BP  Clubbing
JVP  Dehydration

Oedema

Systemic examination

CVS
Respiratory
P/A
CNS

Investigations

Hb  TLC  DLC  ESR
Bl. Sugar  B. Urea  S. creat.  Urine R/M
S. Cholesterol  CPK-MB  Trop-T  X-ray PA-view
ECG
**Echocardiography**

LVEDD ..... LVEDD ..... FS ...%   IVRT ....... msec

EDV ..... ESV ..... EF .....%   E-wave ..... cm/sec

RWM ..........................   A-wave ..... cm/sec

.............................   D-time ..... msec

Remarks : .................................................................

.................................................................

**Hospital Summary**

<table>
<thead>
<tr>
<th>Date</th>
<th>HR</th>
<th>PR</th>
<th>RR</th>
<th>Chest</th>
<th>JVP</th>
<th>BP</th>
<th>S3/4</th>
<th>ST-T changes</th>
<th>Compl.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Treatment given :** .................................................................

.................................................................

.................................................................

.................................................................
ECHOCARDIOGRAPHY

The patients were examined in left lateral position (To obtain a good echogenic window) 2-D and Doppler echocardiography examination were performed with HP-Sonos-2000 cardiac Ultrasound Unit using 2.5MHz transducer. Measurement of different cardiac chamber were made according to the recommendation of the American Society of Echo-cardiography. The systolic and diastolic functions were examined as follows:

**Systolic function:**

i) **Ejection fraction**: This was calculated as the percentage of change in LV volume between diastole and systole from apical four chamber view by using Simpson's method.

ii) **Fractional shortening**: This was calculated as percentage of change in dimension between IV septum and posterior wall of LV at end diastole and end systole.

iii) **Regional wall motion**: For this purpose LV was divided into 16 segment model according to American Society of Echocardiography as described previously.
All 16 segments visualized from multiple tomographic plane of surface echocardiography and any abnormalities of wall motion noticed, and graded as: Normal-1, Hypokintic-2, Akintic-3, Dyskinetic-4, Aneurysm-5.

**Diastolic function:**

For diastolic function apical four chamber view was used. Pulsed wave doppler mitral flow velocities were recorded by placing simple volume between the leaflet tips in the center of flow stream. Doppler gain and filter were adjusted to obtain the best spectral recording and the transmitial peak rapid filling velocity (E-wave velocity), peak atrial filling velocity (A-wave velocity). E-wave velocity deceleration time (DT) and E/A ratio were measured. Also LV isovolumetric relaxation time (IVRT) was recorded from apical four chamber view by simultaneous recording of the mitral and aortic flows at a speed of 100mm/sec.

* * * * *