Discussion
DISCUSSION

The present study was undertaken to assess echocardiographic evaluation of systemic hypertensive patients by means of echocardiography (M-mode, 2D and Doppler) in 60 cases.

Although conventional ECG and radiography provide some information about the cardiac anatomy, these remain silent regarding myocardial functional impairment. Contrast ventriculography in addition to being a invasive investigation carries risk of nephropathy, anaphylaxis and more over because of dye, diuresis may influence ventricular function.

Out of these we had chosen echocardiography as this can be employed safely in any setting without patient preparation, discomfort and convinence. This is noninvasive economical and can be repeated any number of times.

The age wise distribution of hypertensive cases in various age group has been well highlighted by many workers like Janeway (1913), Bell and Clawson (1928), Be Chgaard (1946) and Paulwood (1968). In our study, the age of patients with systemic hypertension ranged from 31-68 years with mean of 49.3±9.8.
maximum number of cases were between 41-60 years being equally divided in 5th and 6th decades.

The male: female ratio of 2:1 in conformity with the study of Bell and Clawson (1928) and Gaur et al (1956).

Echocardiography vs. ECG and radiography to detect LVH in systemic hypertension

Echocardiography showed LVH in 53.3% cases of hypertension as given in table-6. In these patients ECG indicated LVH in only 2 cases (6.6%) while radiography was even a poorer parameter which suggested LVH in only one case (3.3%). Echocardiography therefore, was found to be far superior method to detect earliest increase in the girth of LV wall. Early detection may useful in predicting not only the prognosis but also highlighting therapeutic measure to control hypertension.

In the study of Savage et al (1989), 3% cases were found to have LVH in hypertensives and 5% by chest X-ray while echocardiography detected in 67%. Pearson, Gudipati et al (1987), found that out of 15 patients of hypertension, only one met ECG criteria of LVH, while 8 cases have echocardiographically proved LVH. Findings are also in conformity with Woythaler JN et al
(1983) and Daugherty et al (1984), who found quantitative M-mode echocardiography more sensitive and specific as compared with electrocardiographic voltage and Este's criteria as an index of hypertrophy.

LVH and LV dysfunction

In the present study LV dysfunction was found in 76.6% hypertensive subjects while it was normal in rest 23.3% Savage et al (1989), found deranged LV function in 60% cases of hypertension.

Among the hypertensive cases 73.3% had diastolic dysfunction while only 13.3% had abnormal systolic function. Combined dysfunction was found in only 10% cases. These findings are consistently with so many workers who also found systolic dysfunction uncommon in such cases while diastolic dysfunction was the rule (Pearson and Labovitz, 1987).

The incidence of LVH was 53.3% in this study by echocardiography, among cases of systemic hypertension. Similar incidence is reported by Savage et al (1989), who found it in 615 cases of hypertension by echocardiographic measurements. All the cases with LVH had LV dysfunction and that too mostly in the
form of diastolic dysfunction (100%), while systolic or combined
dysfunction occurred in only 18% cases of LVH. In patients with
combined dysfunction if LVH it was present, it was of eccentric
type.

This also is in agreement with various authors. Smith et al
(1985), Pearson and Labovitz (1987), and Papademetriou et al
(1985), found abnormalities in diastolic properties of left ventricle in
patients with LVH secondary to systemic hypertension, an usual
finding.

In the present study diastolic dysfunction was present in 6
cases without LVH and one case of systolic dysfunction was
present without LVH among hypertensives. Inouye et al (1984) had
also observed LV diastolic dysfunction without LVH. The
occurrence of diastolic dysfunction preceding LVH could be
explained on the basis that factors beside increase in LV mass are
also responsible for altered LV filling dynamics. The other
possibility is that in such patients although increase in LV mass
has occurred but yet this increase is not sufficient enough to meet
criteria for LVH by echocardiography.
Inouye et al (1985) also observed that severity of LV diastolic dysfunction increases in hypertensives with LVH.

**Risk factors and LV dysfunction**

In the present study LV dysfunction correlated well with advancing age of patient. This is in agreement with the study of Savage et al (1989) who also found decrease in ejection fraction with increase in age.

No definite correlation was found between severity of hypertension on LV dysfunction in this study which is consistent with conclusions of Savage et al (1989).

LVH in hypertensive patients increases with increase in age, duration and severity in the present study.

Savage et al (1989), also found positive correlation with age of hypertensive and severity and duration of hypertension.

In this study there was positive correlation of LV dysfunction with increase in age and blood pressure.

LV dysfunction was present in asymptomatic cases of hypertension also which is important from therapeutic point of view for otherwise these cases would have been treated as without
target organ damage. No sex wise preponderance of LV dysfunction was found as in Inouye et al 1985 and others.

**CHF and Systemic Hypertension**

Congestive heart failure is a common and often lethal complication of chronic systemic hypertension. In the present study 3 cases of systemic hypertension also had CHF clinically. On echocardiographic evaluation, diastolic dysfunction, systolic dysfunction, and combined dysfunction was found equally prevalent in them i.e. 33%.

Earlier studies implicated that in CHF, only systolic functions of LV was deranged, but now CHF cases with isolated diastolic or combined dysfunction has been recognized by Pearson and Labovitz (1987), Topol et al (1990). Among such CHF cases with diastolic dysfunction, systemic hypertension has been found to be a major cause.

Inouye et al (1984), postulated that systolic dysfunction is uncommon in patients with prehypertension and stage 1 hypertension, even though this group forms the substrate form which many persons with CHF will emerge. In contrast, diastolic dysfunction is the rule.
This is consistent with the early appearance of left atrial enlargement in the evolution of LVH and may explain the dyspnoea and pulmonary congestion, which are sometimes seen in hypertensive patients.

Our findings are in agreement with those of Dougherty et al (1984), who studied 188 patients with CHF. 64% of them had reduced LVEF while 36% had normal EF. Of these patients with normal EF, 65% were due to systemic hypertension.

These findings point out that such patients need little inotropic support, rather therapy should be aimed at improving the diastolic filling.

Echocardiography thus permits rapid and non-invasive detection of cardiovascular complications in systemic hypertension, some of which would remain unrecognized or even unsuspected.