

# DISCUSSION

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Hypertension is a major risk factor for atherosclerosis and thus for cardiovascular disease.

Indians are particularly at a higher risk for cardiovascular disease than other populations due to the genetic predisposition.

It is estimated that by the year 2010 A.D., 60% of all patients with cardiovascular disease would be from India.

This study was thus performed to detect endothelial dysfunction in hypertensive subjects, which serves as an early marker of atherosclerosis.

In our study, the endothelial function in hypertensive subjects was assessed non-invasively by measuring the brachial artery diameter, and was compared with 40 healthy matched controls.

The correlation of endothelial function with parameters such as age, sex, duration of hypertension, electrocardiographic evidence of LVH, Lipid profile and hypertensive retinopathy was also assessed in our study.

Flow mediated dilatation (FMD%) and glyceryl trinitrate mediated dilatation (GTN%) were used as markers of endothelial dependant and endothelial independent function respectively.

The baseline parameters in our study, ie number of cases, age and sex distribution, fasting blood sugars, lipid profile and resting brachial artery diameter were comparable in both the study and control groups.

Our study showed that both the systolic & diastolic blood pressures of the hypertensive subject greater than that in the controls. This was observed although the hypertensives were on treatment. This shows that the hypertensive patients are inadequately treated. These findings are similar to those of the JNC-7 committee.

In our study, the mean flow-mediated dilatation (FMD%) was significantly less in the hypertensive groups as compared to the control. ( $p < 0.0001$ )

This was observed for both males and females in the study group.

These results are consistent with studies by liyama K et al (64) and by Juan C et al ( 65).

The mean glyceryl trinitrate mediated dilatation (GTN%) was also significantly lower in the hypertensives as compared to the controls. ( $p < 0.001$ )

Similar results were obtained in the study by Juan. et al . (65)

However, in the study by Iiyama et al (64) the mean GTN% was not significantly different in the hypertensive group when compared with the controls. The difference between our and the above study may be due to the later detection of hypertension in our setup so that endothelial independent impairment of vasodilatation has occurred in addition to the endothelial-dependant dysfunction.

In relation to the duration of hypertension, there was an inverse correlation between the FMD% and duration of hypertension ( $p < 0.05$ ). The same was true on comparing the GTN% in the two groups namely, duration of hypertension less than or more than 10 yrs.

These results are consistent with those of Ramsey M et al. (66)

In our study, we found an inverse correlation between the serum total cholesterol and FMD% ( $p < 0.01$ ) on comparing hypertensives with serum total cholesterol less than 200 mg% with those above this value. Similar results were obtained on comparing the GTN% in the two groups. ( $p < 0.01$ ) our results are consistent with those of study by Creager MA et al (67)

The serum LDL – cholesterol levels in the study group showed an inverse correlation with FMD% on comparing hypertensives with S.LDL –C less than 130 mg% with those more than this value. ( $p < 0.05$ ). No association of LDL- cholesterol levels and GTN% was found.

These results are consistent with those of study by Creager MA et al. (67)

In our study, serum triglyceride levels correlated inversely with the FMD% ( $p < 0.01$ ). No association of serum triglyceride levels was found with GTN% ( $p > 0.05$ ). These results are similar to those in study by Maggi FM et al. (68)

The serum HDL- cholesterol showed a direct relationship in the study group with the FMD% ( $p < .001$ ).

No association of HDL-cholesterol levels and GTN% was found .

Our findings are similar to those in study by Toikka JO et al. (69)

Our study showed that hypertensives with left ventricular hypertrophy on ECG showed a lower FMD% than those without LVH. ( $p < 0.001$ ).

No association of LVH was found with GTN% ( $p > 0.05$ )

These results are consistent with those of study by Muiesan et al. (70)

In our study, the presence of hypertensive retinopathy did not correlate with the FMD% or GTN%. This may be because only 9 individuals in our study group had retinopathy. A larger sample would be required to demonstrate a correlation if it were present.