Study of Endothelial Dysfunction in Diabetes Mellitus by Doppler Flow Mediated Dilatation of Brachial Artery

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Sir,

This is with reference to the original article published as “Endothelium-dependant brachial artery flow-mediated vasodilatation in patient with diabetes mellitus with and without coronary artery disease” by K Bhargava et al,1 an important information on the subject of endothelial dysfunction in the north Indian population. May I add some additional details in it. We conducted a study on endothelial dysfunction in diabetes mellitus on a group of 50 consecutive patients of diabetes mellitus and correlated them with the severity, duration and HbA1C levels.

We found a significant inverse relation between duration and endothelial dysfunction in diabetes mellitus which was also observed by Johnstone et al.2 We also found that there was an inverse relation between HbA1C and endothelial dysfunction which was also observed by Furomoto et al.3 In our study, 5 patients had diabetic retinopathy, 7 had non-proliferative diabetic retinopathy and 38 had normal fundoscopic picture. FMD values were less in patients with diabetic retinopathy (91.8 ± 15.01) compared to those in whom there was non proliferative diabetic retinopathy (94.71 ± 10.56) which was also less than in patients with normal fundoscopic picture (106.54 ± 13.80). The probability value was less than 0.05 which shows that there was statistical significance. Sogawa et al4 in their study showed that there was a significant correlation between plasma glucose levels and flow mediated dilatation.

In our study, 18 patients had albuminuria and 32 patients had no albuminuria. There was a marked decrease in flow mediated dilatation in patients in whom albuminuria was present (95 ± 14.2) than in those in whom it was absent (108.1 ± 12.4). The probability value was less than 0.003 which was highly significant. Steuhover et al5 in their HOORN study showed that there was an inverse relationship between microalbuminuria and flow mediated dilatation which was significant. Also, it was found that FMD values were less in diabetic patients (93.23 ± 6.68), compared to patients with impaired glucose values (108.64 ± 5.30) which was less as compared to patients with normal glucose values (124.09 ± 8.95). The probability value was < 0.0001 which is highly significant. Kawano et al6 in their study showed that there was a significant correlation between plasma glucose levels and flow mediated dilatation.

Ravikumar et al7 have compared the FMD and Augmentation Index (AI) in diabetic and non-diabetic subjects and correlated these measurements with the carotid IMT in the CUPS-9 study.2 FMD values were significantly lower among diabetic subjects compared with non-diabetic subjects (2.1 ± 2.95% vs 6.64 ± 4.38%, p < 0.0001). At any given age, diabetic subjects in the study had significantly higher AI and lower FMD values compared to non-diabetic subjects. Chugh et al8 evaluated the effect of glycaemia on FMD endothelial function in type 2 diabetic patients have reported significant improvements in endothelial function after 12 weeks of treatment during which there was a concomitant significant improvement in glycaemic control in them. Regardless of whether these patients started with a low or very low FMD in those with

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364
fair or poor glycaemic control, the FMD values reached close to those observed in the control group once excellent glycaemic control was achieved in them. These results point to a significant reversible component of endothelial dysfunction that is amenable to good glycaemic control at least in those diabetic subjects who did not already have evidence of clinical vascular disease such as hypertension, or other macroangiopathy. Earlier studies have not reported effects of glycaemic control in improving endothelial function in diabetes and if confirmed in a larger subset of diabetic patients the results of the present study would provide all physicians yet another reason to strive for achieving strict glycaemic control in diabetic patients.

To conclude, flow mediated dilatation was inversely related to diabetic neuropathy, diabetic retinopathy, diabetic nephropathy and blood sugar values, HbA1C and duration of diabetes mellitus. However, the sample size should be sufficiently large and should include multicentric studies to arrive at a definite conclusion.

References


