Different relation between 24-h blood pressure and distensibility at different peripheral arteries. Data from the European Lacidipine Study on Atherosclerosis (ELSA).

INTRODUCTION: The European Lacidipine Study on Atherosclerosis (ELSA) has been planned to investigate the effect of reduction in office and ambulatory blood pressure by lacidipine versus atenolol on carotid artery wall thickness in mild to moderate essential hypertensive patients with no metabolic abnormalities. One prespecified sub-study of ELSA focused on measurements of arterial distensibility in the carotid as well as in the radial artery to determine the relationship of functional arterial properties with office versus ambulatory blood pressure (BP) values as well as the correspondence between functional and structural arterial alterations.

METHODS: The sub-study was conducted on 124 patients recruited in four centres (Monza-Milan, Paris, Grenoble and Glasgow). BP was measured both by a mercury sphygmomanometer and by 24-h ambulatory monitoring. Common carotid artery wall thickness was measured by certified sonographers as described in the main study. Common carotid and radial artery distensibility were obtained by echotracking techniques, which allowed to relate changes in arterial diameter with systo-diastolic BP changes. RESULTS: Carotid artery wall distensibility showed (1) a negative correlation with office and
more so 24-h average systolic BP ($r = -0.45$ and $-0.58$, $P< 0.008$ and 0.001) but not with office or 24-h diastolic BP) and (2) a negative correlation with the corresponding wall thickness ($r = -0.47$, $P< 0.005$). In contrast, at the radial artery level distensibility and thickness showed no correlation with each other and with BP. Carotid (but not radial) artery distensibility also correlated with ambulatory systolic BP variability but the correlation was lost after adjustment for age and mean BP values. CONCLUSION: These data suggest that stiffening of large elastic artery is reflected more by ambulatory than office BP elevations, systolic BP being much more important than diastolic. Alterations of large elastic arteries function is related to structural wall changes. Functional and structural properties of middle-size muscle arteries are independent of BP.