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A Study of Arterial Stiffness Index (ASI) in Arterial Stiffness Danger Factors

National Public Service Personnel Mutual Aid Associations Federation Tachikawa Hospital, Health Medicine Center ¹, Department of General Medicine, Kyorin University School of medicine ², Kyorin University School of Health Sciences ³

Hideaki Sato ¹, Keiichiro Harashima ³, Toshiaki Takeichi ², Hideaki Shimazu ³, Jyun-ichi Hayashi ², Kiyoshi Kitamoto ²

Objective:

The handy Cardiovison Model MS-2000 device uses an oscillometric method to non-invasively measure the degree of arterial stiffness (ASI, arterial stiffness index). Here, we study ASI in regards to the arterial stiffness risk factors: hypertension, diabetes, and hyperlipidemia.

Method:

346 medical exam recipients (male 224, female 122, average age 49 years plus or minus 9) at our center participated in this study. Measurement was conducted on the upper arm of the exam recipient and biomedical data was compiled on the same day as the exam. The ASI scores of three groups, hypertension, diabetes, and hyperlipidemia, were compared with the ASI of healthy/normal control group.

Result:

The hypertension group demonstrated an ASI of 67 plus or minus 45, and in comparison with the healthy/normal group's ASI of 44 plus or minus 14, was significantly high. In addition, ASI proved to be closely correlated with systolic blood pressure ($r=0.427$, $p<0.0001$) and diastolic blood pressure ($r=0.130$, $p<0.05$). The diabetes (42 plus or minus 13) and hyperlipidemia (40 plus or minus 9) groups falling within normal blood pressure range demonstrated no change in comparison with the normal/healthy control group, but when combined with the hypertension demonstrated significantly high values. Diabetes plus the hypertension group scored 84 plus or minus 68, and the hyperlipidemia plus the hypertension group scored 59 plus or minus 34.

Conclusion:

The ASI score for the arterial stiffness risk factor of hypertension was significantly high in

comparison with the healthy/normal control group. In addition, diabetes and hyperlipidemia demonstrated no change when compared individually with the normal/healthy group, but when combined with hypertension, demonstrated high scores.

This study suggests that the combination of hypertension and diabetes or hypertension and hyperlipidemia is indicative of progressive arterial stiffness. We believe that the ASI measurement will be relied upon as a new non-invasive method for determining arterial stiffness.