

USEFULNESS OF STIFFNESS INDEX DERIVED FROM DIGITAL VOLUME PULSE AS A SCREENING TOOL FOR CARDIOVASCULAR RISK IN THE COMMUNITY

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OBJECTIVES: We have demonstrated that arterial stiffness (SI) simply derived from digital volume pulse was associated with overt renal dysfunction and vascular disease in hypertension. Now we studied the usefulness of this method as a screening tool for identification of cardiovascular risks in a community-based study.

METHODS: We enrolled 102 subjects (age 60 ± 13 years, 66 women) from a community-based cardiovascular risk screening program. Digital volume pulse was measured by photoplethysmography after 5 minutes of rest. The SI was computed as body height divided by transition time from early systolic peak to the inflection point of reflection wave.

RESULTS: All these measurements were completed within 3 hours. SI significantly correlated with age ($r = 0.344$, $p < 0.001$) and systolic blood pressure ($r = 0.283$, $p = 0.005$). SI was also higher in male subjects. Regarding cardiovascular risk factors, there were 19 subjects (19%) without risk factors, 39 subjects (38%) with one risk factor and 44 subjects (43%) with multiple risk factors. SI significantly increased gradually from no risk factor, one risk factor, to multiple risk factors (10.1 ± 2.5 , 11.4 ± 3.1 , 12.7 ± 4.3 m/min $p=0.036$). The area under ROC (receiver operating characteristic) curve was 0.648 (95% CI: 0.517-0.779) for identifying risk factors by using SI.

CONCLUSION: SI derived from digital volume pulse was a useful marker for arterial stiffness and was associated with cardiovascular risk factors. Although the accuracy of the method was modest, this method was still useful in a community setting.

Keyword: arterial stiffness, digital volume pulse, risk factor