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Increased Arterial Augmentation and Augmentation Index as Surrogate Parameters for Arteriosclerosis in Subjects with Diabetes Mellitus and Nondiabetic Subjects with Cardiovascular Disease

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Abstract

Background:

Arterial augmentation (AP) and the augmentation index (Aix) are surrogate parameters of arterial stiffness and are commonly used as predictors for cardiovascular risk. The aim of this study is to compare these parameters in diabetic subjects and nondiabetic cardiovascular risk subjects with healthy control subjects.

Methods:

One hundred sixty-six nonsmoking subjects aged between 35 and 70 years were included in the study, which included 100 subjects with cardiovascular disease but not diabetes (mean age 62.73 ± 8.75 years), 33 subjects with type 2 diabetes (66.58 ± 2.69 years), and 33 healthy controls (51.89 ± 8.91 years). In these subjects, arterial stiffness was measured by the difference between the second and the first systolic peak of the central pressure waveform, and the Aix was calculated as the percentage of Aix from pulse pressure.

Results:

Arterial augmentation was increased in subjects with diabetes (DM) with 10.21 ± 6.97 mm Hg and in subjects with cardiovascular disease but not diabetes (CV) with 10.74 ± 5.29 mm Hg in comparison to healthy controls (C) with 6.59 ± 3.97 mm Hg ($p < 0.0005$ DM vs C; $p < 0.00005$ CV vs C). Moreover, Aix was increased with 26.00 ± 9.91% in CV subjects compared to healthy controls with 19.84 ± 9.37% ($p < 0.02$ CV vs C). The augmentation index was increased with 21.12 ± 11.21% in subjects with type 2 diabetes mellitus compared to controls, but failed to be statistically significant. There was no statistical significance in arterial augmentation or the augmentation index between CV and diabetic subjects.

Conclusion:

The results of our study revealed a comparable increased augmentation index as a surrogate measure of arterial stiffness and arteriosclerosis in subjects with diabetes mellitus and in nondiabetic subjects with cardiovascular disease.

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Abbreviations: (AP) augmentation, (Aix) augmentation index, (PWA) pulse wave analysis

Keywords: augmentation, augmentation index, cardiovascular risk, diabetes mellitus type 2, pulse wave analysis

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