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Research Article

Correlation between age and pulse wave velocity in adults, salvador, bahia, brazil in a population-based study: Design, methods and preliminary results

Abstract

Cardiovascular diseases are the leading cause of death in Brazil. The pulse wave velocity (PWV) is an independent cardiovascular risk factor detecting arterial stiffness, correlated to age, among other variables.

Objective: Analyze age (i) and PWV correlation on individuals aged ≥ 18 years.

Methods: A cross-sectional exploratory study on a representative population of a community in Salvador-Bahia-Brazil. The data were obtained from a simple random sample, including 301 individuals, over 12 census sectors. 95 individuals of both sexes were initially assessed, from November 2016 to February 2018. Home visits were carried out to fill out individual and home records and to schedule examinations, including PWV measurement, in an outpatient clinic. The carotid-femoral PWV was measured as the velocity between the carotid and femoral wave coupled to the electrocardiogram, considering the beat-to-beat pulse wave base, adjusted for a .8 ratio. Femoral carotid length is measured in millimeters. An AT Cor SphygmoCor applanation tonometer was used. Central and dispersion trend measures were analyzed and stratified by sex, age and PWV. Frequency and descriptive measures, Spearman's linear correlation coefficient between PWV and age and Prevalence Ratio per sex were obtained with the respective confidence intervals, estimated as a function of the Odds Ratio. STATA v.12 software was used. The level of statistical significance was 5%. The standards of the human research ethics board were observed.

Results: There was a prevalence of women (65.3%); mean PWV was higher among men (9.5 ± 2.5) compared to women (8.9 ± 2.5); 68.7% of women and 31.3% of men presented normal PWV values. Statistically significant trends (ES) of PWV mean gradient increase over age groups ($p = 0.000$) were found. There are no changes in the mean value of PWV among participants that are less than 30 years old. The prevalence of adjusted abnormal PWV was 29.5%, 36.4% among males and 25.8% among females. The chance of women, when compared to men, to present PWV abnormality was 1.64 times (95% CI: 0.66-4.07). There was a positive and statistically significant moderate correlation between adjusted PWV values and age ($r=0.54$, $p=0.0000$). The correlation was moderate and statistically significant among women ($r=0.63$, $p=0.0000$), weak positive and statistically significant among men ($r=0.41$, $p=0.0167$).

Conclusion: The correlation between PWV and age progression in both sexes was verified, with higher correlations found for women.

Introduction

Cardiovascular diseases are the main cause of death in Brazil and Bahia, accounting for 28% and 24.2% of all deaths in both sexes, respectively [1]. Increased arterial stiffness has been associated as an independent risk factor for fatal cerebrovascular accident, coronary events, and general and

cardiovascular mortality in hypertensive patients and in the general population [2-5].

Aging itself has been pointed as the main cause of increased arterial stiffness, either as a physiological process or as an early underlying pathological mechanism. With age, arteries are more likely to have their structure and function changed.