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Investigating the correlation of the second derivative of digital pulse wave (DPW) with QT variability index in women

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Abstract

Objective: To determine the correlation between the second derivative of digital pulse wave and the QT variability index.

Methods: The cross-sectional study was conducted from October 2021 to May 2022 at the Department of Physiology, College of Medicine, University of Mustansiriyah, Baghdad, Iraq, and comprised healthy women. Samples were raised by simple random technique. Digital pulse waves were captured using a fingertip pulse wave transducer. Lab Chart Pro version 7.2 was used to automatically detect and quantify the amplitude of A, B, C, D and E waves expressed by the second derivative. QT interval of each beat was recorded by electrocardiogram, and was calculated automatically via Lab chart Pro version 7.2 without averaging. Data was spread out on Microsoft Office Excel 2013 and analysed using SPSS version 26.

Results: There were 55 women with mean age 37.4 ± 9.9 years and mean body mass index 31.2 ± 7.2 kg/m². Age was positively associated with QT variability index and normalised wave amplitude values of B/A and (B-C-D-E)/A ($p < 0.05$). QT variability index was positively associated with the normalised values of the second derivative of digital pulse wave B/A and (B-C-D-E)/A ($p < 0.05$).

Conclusions: QT variability index I was significantly correlated with second derivative of photoplethysmogram, and both were affected by age and arterial stiffness.

Keywords: Photoplethysmography, Vascular Stiffness, Electrocardiography, Transducers.

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