ABSTRACT 149

Title: **Vascular Age Sustainability in Ageing Health Management**

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Background: Health sustainability and management cost is a global financial concern today. Ageing being a natural contributor makes the health management a distressing challenge to most industrialized countries. The research motivation today is in identifying a single reliable index that can predict vascular ageing. A method that is low cost, operator independent, and with remote operational capacity can be used to determine and monitor the rate of human ageing and how with this knowledge, one can be motivated to improve health by delaying the effects of ageing.

Objectives: The aim was to select the most reliable form of pulse wave analysis from the vascular structure that can best achieve the goal of establishing an index for ageing health management.

Methods: The resting peripheral blood volume change of 184 subjects within two age categories (20–44, 45–66) has been characterized using a novel algorithm for the automated determination of a median pulse function. The contour of this resting median pulse has been analyzed with regard to the reference (clinically defined healthy 19 years old male and female) pulse characteristics.

Results: The similarity between the two pulses quantified as fitness value of the subject were further analyzed and underwent logistic regression modeling to produce the vascular risk index and age. The quantified vascular age is an ageing index against the chronological age. A repeatability (93.22±1.18) and variability (6.18±1.51) study was conducted on ten randomly selected subjects in further establishing the single pulse usage. The proposed vascular risk prediction model has produced the following results: sensitivity/specificity in classifying risk is 100.0 %/100 % for 20 to 44 years and 85.7% / 95.2 % for 45 to 66 years old, respectively. The r-square value is 0.8226 for age (20 – 44) and 0.9205 for age (45 – 66) years old

Conclusions: This study provides the potential of using low cost, noninvasive and portable technique in establishing vascular age as an ageing health index.