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Can We Slowdown Early Vascular Aging and Cognitive Disabilities in High Risk Young Adults?

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Rec date: September 25, 2014, Acc date: September 27, 2014, Pub date: September 30, 2014

Introduction

In recent years, the new concept of early vascular aging (EVA) has emerged as a useful tool to aid understanding of how cardiovascular risk increases in relation to the biological aging process. The core feature of EVA is arterial stiffness, which can be measured as increased pulse wave velocity in relation to a subject's chronological age and sex [1]. EVA is the early arterial aging observed in young patients with essential hypertension compared with age- and gender-matched normotensive individuals [2]. Pulse pressure (an indirect measure of arterial stiffness) is a robust predictor of cardiovascular events. One independent predictor of cardiovascular morbidity and mortality in hypertensive patients is pulse pressure [3]. Although pulse pressure derives from the interaction of cardiac ejection (stroke volume) and the properties of arterial circulation (arterial stiffness and wave reflection), elevated pulse pressure is thought to be largely associated with increased arterial stiffness due to aging, arteriosclerosis, or both [3,4]. Orthostatic hypotension (OH) is one clinical manifestation of diabetic autonomic neuropathy and is also a significant risk for fall, syncope, cardiovascular disease and all-cause mortality. Mean arterial pressure and pulse pressure are keen to determent of cerebral perfusion and cognitive performance [5].

Non invasive method for early detection of early vascular aging and cognitive disabilities:

I. **High risk individuals**: They are Young adult offspring's of known Type 2 diabetic and hypertensive parents aged between 18-25 years. Early identification of vascular Dysfunctions by using following non-invasive techniques and simple scoring system.

II. **Non–invasive Parameters to be studied**:

- 1. Hypertension Risk Prediction from the Framingham Heart Study [6].
- 2.   Indian Diabetic Risk Score (IDRS [7].
- 3.   **Anthropometry** :

BMI was calculated by the formula Weight (kg) = {Height (m)} 2.

Waist to hip ratio (WHR).

4. **Physiological parameters:**

Resting average heart rate,

Resting systolic blood pressure,

Diastolic blood pressure,

Mean arterial blood pressure,

Pulse pressure.

Arterial wave form analysis & augmentation index [1]

Resting short term 5 min ECG Recording for HRV (Heart rate variability) [8]

5. **Neuro–cognitive test battery [9,10]**

Trail making test A.

Trail making test B.

Digit span test – Forward & Reverse.

Letter cancellation test.

Discussion, Conclusion & Recommendation:

Future prevention of premature vascular aging will be achieved by early identification of high risk group and life style modification is the first intervention to consider in adults followed by drug therapy to control risk factors such as hypertension, increased blood pressure variability, hyperglycaemia, and hyperlipidaemia. These implementations should start early in life to prevent cardiovascular diseases, maintain good quality of life and thereby increase the life expectancy.

Acknowledgment:

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