

# Coronary Risk Factors and Ambulatory Blood Pressure and Heart Rate in Asian Indians

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**Abstract:** Wang and co-workers reported on ethnic differences in ambulatory blood pressure (ABP) in African Americans compared to people of European origin [1]. Data on ABP and heart rate (HR) on American Indians and Asian Indians could have made this study even more interesting [2]. Details on diet and lifestyle factors also appear to be important for mapping circadian changes in blood pressure (BP) in populations studied by the BIOCOS group [3]. Circadian changes in BP are synchronized by the daily routine *via* plasma concentrations of neurotransmitters, released by the pineal, pituitary and adrenal cortices, coordinated by clock genes situated in the brain's suprachiasmatic nucleus [2], and at the cellular level [4, 5].

**Keywords:** Fruit, vegetable, w-3 fatty acids, prayer, heart rate.

## INTRODUCTION

The role of ABP monitoring (ABPM) [6] should include detection of abnormal BP variability such as circadian hyper-amplitude-tension (CHAT). Associations between Vascular Variability Disorders (VVDs), including abnormalities in the variabilities of BP and HR, with diet and lifestyle factors should be sought, so that preventive measures can be instituted in a timely fashion, also considering the best scheduling in time [3, 7-9].

Many studies focusing on this issue have relied mostly on single measurements of BP and HR rather than on week-long profiles obtained with an ABPM, interpreted with a view of their time structures (chronomes) [3]. It is now accepted that ABPM is superior to clinical spotchecks in terms of diagnosis and prognosis [6]. Our study involved 209 subjects (142 men and 67 women) 42.4 ± 18.0 years of age living in Moradabad, India.

Anticipated relationships were found. Namely, the MESOR of SBP, DBP and HR increased with age (SBP:  $r=0.260$ ,  $P<0.001$ ; DBP:  $r=0.269$ ,  $P<0.001$ ; HR:  $r=0.242$ ;  $P<0.005$ ), as well as with BMI (SBP:  $r=0.232$ ,  $P<0.005$ ; DBP:  $r=0.257$ ,  $P<0.001$ ). The MESOR of HR also decreased with increased activity ( $F=5.558$ ,  $P=0.001$ ). The MESOR of SBP also decreased slightly with increased activity, yet the relationship is not statistically significant.

Additional relations were uncovered. The SD of DBP increased as a function of BMI ( $r=0.248$ ,  $P=0.002$ ), whereas

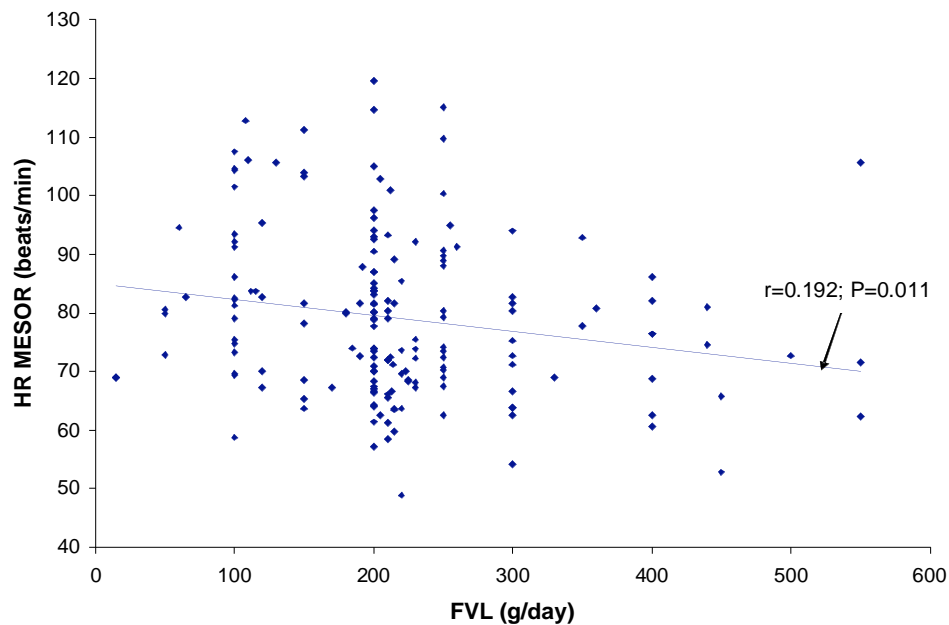
the SD of HR slightly decreased with age ( $r=-0.177$ ,  $P=0.015$ ). The percentage time DBP was above time-specified reference values was elevated in subjects who reported consuming alcohol (17.2% vs. 7.1% in subjects who did not report consuming alcohol, Student  $t=2.367$ ,  $P=0.020$ ). Both the MESOR and the circadian double amplitude of both SBP and DBP, as well as the SD of DBP decreased as a function of social class.

Of particular importance is the effect of consumption of fruits, vegetables and legumes (FVL) on the MESOR of HR ( $r=-0.192$ ,  $P=0.011$ ), Fig. (1). The circadian double amplitude of HR was also found to be higher among Hindus who prayed (11.7 beats/min) as compared to Hindus who did not pray (8.1 beats/min) (Student  $t=2.137$ ,  $P=0.035$ ).

High BP is a serious public health problem in developing as well as developed countries, to the point that the World Health Organization (WHO) is considering using affordable ABPM around the world, a project now underway by a group of volunteering engineers in Minnesota (<http://www.phoenix.tc-ieee.org/>). Immigration of Asian Indians has been shown to influence BP, partly related to effects of urbanization [9].

High BP and altered BP variability can be treated [3, 8]. The effect of treatment on BP variability can be very different from one agent to another and from one treatment schedule to another. Because CHAT, that is too large a circadian variation in BP has been associated with an increase of 720% in the risk of adverse cerebral events [3, 8], it is important to determine a given treatment's effect not only on the MESOR but also on the circadian amplitude of BP.

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**Fig. (1).** Association of fruit, vegetable and legume intake with decrease in heart rate.

Drugs such as ACE-inhibitors and coenzyme Q10 which is rich in the mitochondria of the arterial smooth muscle are being tried for treatment of BP variability by our group. Functional foods rich in  $\omega$ -3 fatty acids, which are rich in neurons and cell membrane phospholipids, may also have a beneficial effect as these fatty acids can influence the brain-heart connection [2].

#### CONFLICT OF INTEREST

Declared none.

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