Behavioral pattern, life style and socio economic status in elderly Normolipidemic Acute Myocardial Infarct Subjects - A case control study from South Asia
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Citation

Abstract
BACKGROUND: Mortality due to CAD is increasing at an alarming rate in developing countries and it is going to be the largest killer by 2020. Major risk factors include rapid urbanization, physical inactivity, stressful employment and the personality of an individual, all of which act synergistically resulting in increased CAD rates. Though Indians have less conventional risk factors, they are more susceptible to this disease. The current study was focused on impact of behavioral aspects, lifestyle and physical activity influence on CAD, as these risk factors are not properly established by recent research. AIM: The study was undertaken to evaluate the impact of behavior, lifestyle and physical activity in predicting CAD risk in normolipidaemic acute myocardial infarct patients and to compare the findings with healthy subjects. SETTING & DESIGN: Lipid profile and behavioral aspects and lifestyles were determined in 165 normolipidaemic acute myocardial infarct patients and compared with 165 age/sex-matched controls. MATERIAL & METHODS: Total cholesterol, triglycerides, and HDL-cholesterol were analyzed enzymatically using kits obtained from Randox Laboratories Limited, Crumlin, UK. Plasma LDL-cholesterol was determined from the values of total cholesterol and HDL-cholesterol using the Friedwald's formula. The lifestyle and behavioral aspects of the subjects were determined using pre-tested questionnaires. STATISTICS: The values were expressed as means ± standard deviation (SD) and data from patients and controls were compared using students 't'-test. RESULTS AND CONCLUSION: Lipid profiles were higher in case of patients than with controls. Apart from HDL-c levels (p<.001), which were significantly lower in patients (p<.001). Patients had higher serum cholesterol and blood pressure compared to controls in each behavioral assessment parameters. Physical activity was found to be lower in patients compared to controls. Hyperactive, irrelevant thinkers and highly ambitious subjects had higher cholesterol and blood pressure in each category. Mostly the middle socioeconomic class was affected (71%) by AMI. In conclusion, our findings indicated a high prevalence of various behavioral risk factors among the myocardial infarct patients. Remedial measures are needed to minimize future morbidity burden and there by minimizing medical expenses. In regard to the risk factor of smoking, a strict public policy in restricting the behaviour and cigarette distribution may be considered. Although the Government has taken steps in this regard, it is the individual and community who should reduce the risk factor, especially the high risk groups such as lower social status groups.

INTRODUCTION
Emerging epidemics of cardiovascular disease (CVD) have attracted attention as major causes of global disability and mortality [1]. In 1990, fifteen million deaths were attributable to CVD, and among those deaths 63% occurred in developing countries [1]. CVD (mainly heart disease and stroke) was responsible for approximately half of non communicable disease (NCD) mortality and one quarter of the NCD morbidity rate in 1999, mainly in low- and middle-income countries [1]. Ischemic heart disease and stroke are projected to increase further by 2020, and developing countries will experience the highest burden. The disease pattern is increasing drastically among Indians compared to the Westerners [4]. The CAD rates in India are almost four fold compared to the United States, which had similar rates in 1968. CAD is expected to be the largest killer by 2015 [4]. Although Indians have less conventional risk factors still we succumb to the claws of this disease [4]. Rapid urbanization, lifestyle modifications, demanding and stressful employment, sedentary lifestyle and low rates of physical activity have increased the risk of coronary artery disease. Prospective studies have indicated the risk of CVD is almost 50% increased due to stress induced at work [4]. Lower socio-economic status (SES) groups have higher
mortality rates due to CVD. It is a general observation that only part of the socio gradient in cardiovascular disease mortality can be explained by a higher prevalence of classical risk factors such as smoking, serum cholesterol and hypertension \[10\]. Rates of CAD include metro cities such as New Delhi (10%) \[7\], Chennai (11%) \[8\] and states like Kerala, where the largest death rates occur due to CAD (13% in urban areas and 7% in rural areas) \[11,12\]. In Sri Lanka, CAD rates began to increase in 1980 the rates are now almost similar to India \[13\]. In India, hospitalization rates due to acute ischemic syndromes are four fold higher than in the United States and Japan, and almost six folds higher than in China \[14,15,16\]. Before we are totally affected with CAD, we must modify our lifestyle in order to prolong ourselves from the devastating disease. The current study was aimed to establish the effect of lifestyle, behavioral patterns and stress in acute myocardial infarction (AMI) patients who were admitted to Intensive Coronary Care Unit (ICCU) and these effects were compared with normal healthy subjects.

MATERIALS AND METHODS

The study was conducted in Faculty of Medicine, University of Peradeniya, Sri Lanka and Hindustan Institute of Medical Sciences and Research, Sharda Hospital, India. The study comprised of 165 normolipidemic AMI patients, the male to female ratio was 3:1, with ages ranging from 48-69 years, mean ± SD (61.8 ± 3.8 y). One hundred sixty five age-sex matched subjects, with similar ratio of male: female as in patients, were recruited as controls. Their ages ranged from 48-69 years, mean ± SD (60.55 ± 3.98 y). The AMI cases were diagnosed as per diagnostic criteria: chest pain lasting for >3 hours, ECG changes (ST elevation of 2 mm or more in at least two leads), increased creatine phosphokinase (CPK-MB) and aspartate aminotransferase enzyme. Informed consent was obtained from patients and controls recruited for the study and the study were approved by the ethical committee of the Institution.

Exclusion criteria of the subjects: Patients with diabetes mellitus, hyperlipidemia, renal insufficiency, current and past smokers, hepatic disease or taking lipid lowering drugs or antioxidant vitamin supplements.

Inclusion criteria of the subjects: Normolipidemic AMI patients as per the NCEP ATP – III guidelines.

Criteria for defining normolipidemia: Normal lipid profile was defined when total cholesterol was <200 mg/dl, LDL-C<130 mg/dl, HDL-C ≥ 35mg/dl and TG < 200 mg/dl (NCEP, Adult Treatment Panel-III) \[17\].

Criteria for defining dyslipidaemia: Subjects with total cholesterol ≥200mg/dl, low-density lipoprotein cholesterol ≥130mg/dl, high-density lipoprotein <40mg/dl, and triglycerides ≥150mg/dl were considered to be dyslipidemic according to the American National Cholesterol Education Program III guidelines reported \[18\].

Demographic data: This included various lifestyle factors, such as education, socio-economic status, income and type of job. Details of major cardiovascular risk factors such as smoking, diabetes, obesity and hypertension were obtained using a questionnaire.

Blood pressure: The blood pressure was measured using standard mercury manometer. At least two readings at 5 minutes intervals as per World Health Organization guidelines were recorded. If high blood pressure (≥140/90 mmHg) was noted a third reading was taken after 30 minutes. The lowest of the three readings was taken as blood pressure \[19\].

Electrocardiogram: Electrocardiogram (12 lead) was performed on all persons using proper standardization.

Criteria of smoking: Smokers in India consume tobacco in various forms including rolled tobacco leaves (beedi), Indian pipe (chillum, hookah), cigarettes and tobacco chewing tobacco. More than one form is used by many individuals, making it difficult to accurately measure the amount of tobacco consumed. Therefore, users of all types of tobacco products and present and past smokers were considered as smokers.

Criteria for hypertension and obesity: Hypertension was diagnosed when systolic blood pressure was ≥140 mmHg and /or diastolic blood pressure ≥90 mmHg. Body Mass Index (Weight in kg/height in meters \(^2\)) was calculated and obesity was defined as BMI ≥25kg/m \(^2\). Truncal obesity was established when waist-hip ratio was >0.9 in male and >0.8 in female.

Anthropometric data: Height, weight, biceps skin fold thickness, triceps skin fold thickness and waist/hip ratio were recorded. Height was measured in centimeters using stadiometer with an accuracy of 0.01 cm and weight in kilograms using calibrated spring balance. Supine waist girth was measured at the level of umbilicus with a person
breathing silently and standing hip girth was measured at inter-trochanteric level. Mid arm circumference was measured half way between the acromion process of the scapula and the tip of the elbow. Triceps skin fold thickness (TSFT) was measured at a point over the triceps muscle mid way between the acromion and olecranon process on the posterior aspect of the arm. For biceps skin fold thickness the same procedure as TSFT was adopted, but with the measurement done in the midline of the anterior part of the upper arm.

Blood (5 ml) was collected for serum lipid profile, within 10 hours once the patients were admitted to ICCU

Total cholesterol, triglycerides and HDL-cholesterol were estimated by enzymatic methods using the kits obtained from Randox Laboratories Limited, Crumlin, UK. Plasma LDL-cholesterol was determined from the values of total cholesterol and HDL-cholesterol using the following formulae:

\[ \text{LDL-c} = \text{TC} - \frac{\text{TG}}{5} - \text{HDL-c} \ (\text{mg/dl}) \]

Figure 1

Statistical analysis: The data from patients and controls were compared using Student’s ‘t’-test. Results were expressed as mean ± standard deviation (SD). Microsoft Excel for Windows 2003 was used for statistical analysis. ‘P’ values ≤0.05 was considered to be statistical significance.

RESULTS

ANTHROPOMETRIC VARIABLES

The anthropometric variables of the control and cases are represented in Table 1. The mean height in both control and patients were almost similar (Table 1) but the body weight was higher in cases (p<0.001). The mean body mass index (BMI) in control and cases were >25, and was significant (p<0.01). Almost 80% of the patients and 70% of the controls were over weight with significant difference (p<0.001).

The mean waist/hip ratio was significantly (p<0.001) higher in MI patients compared to the controls (Table1). Only 16.3% of controls and 70% of patients had waist/hip ratio ≥0.95. All female patients were ≥0.90 waist/hip ratio, but only 64% of male cases had ≥0.95. Among controls, all the females had a waist/hip ratio ≥0.90 but 6.5% of males had waist/hip ratio ≥0.95.

The mean mid-arm circumference (MAC) in patients was higher than controls (p<0.05) (Table 1) The biceps and triceps skin fold thickness in patients was significantly higher than that of the controls (p<0.001) (Table1). In summary body weight, waist circumference, hip circumference, waist/hip ratio, mid arm circumference, biceps skin fold thickness and triceps skin fold thickness were significantly higher in MI patients compared to controls. Therefore body weight, waist circumference, hip circumference, waist/hip ratio and mid arm circumference, which reflect the body fat content may be considered as predictive factors for future AMI risk even if normolipidemia is observed. This observation is significant in view of a great deal of reliance placed on lipid profile to assess the risk of getting AMI. Furthermore the waist/hip ratio is a more reliable index than BMI for assessing the risk of subjects who are prone to develop MI. The study revealed that statistically significant difference mainly in waist/hip ratio. This parameter should be examined in patients with conventional risk factor.

LIPID PROFILE PATTERN

Serum lipid profile parameters in AMI patients and control are shown in Table 2. Total cholesterol, its ratio to HDL-cholesterol (TC/HDL-C), LDL-cholesterol, triglycerides was significantly higher in AMI patients compared with control (Table 2). Significant difference for HDL-cholesterol between AMI and control was observed (Table 2). On the other hand, LDL-cholesterol and its ratio to HDL-cholesterol (LDL-C/HDL-C) were higher in patients compared with controls (Table 2). No statistically significant difference was observed in TG/HDL-C ratio among patients with controls. Also, significantly lower HDL-C concentration was observed in AMI patients than in the controls (p<0.0001). Total cholesterol, triglycerides, LDL-cholesterol were higher in AMI subjects as compared to control (p<0.0001). Also, significant differences were seen in HDL-C levels between AMI and controls (p<0.0001).

DEMOGRAPHIC CHARACTERISTICS

The socioeconomic status and lifestyle characteristics of the control and MI patients are shown in Tables 3 and 4. The subjects were classified into lower, middle and higher class depending on monthly income of the family. Subjects whose monthly income was ≤ Rs. 5000/month, Rs. 5000-15000
MONTH and ≥ Rs. 15000/month respectively were categorized as lower, middle and higher class. It was observed that most of the control subjects (79.4%) and MI patients (70.9%) belonged to the middle class with 85 male (69.1%) and 32 female (76.2%) of AMI were in this category. Further 101 (61.2%) control and 145 (87.9%) patients belonged to joint family, where all the member of the family lived together even after marriage.

The subjects were grouped according to the educational status based on the highest degree they possessed (Table 3). It was observed that majority of the subjects in both groups were graduates. The educational qualification reflected their type of job profile.

The percentages of male MI patients engaged in mild and moderate physical activity were 82% and 83% respectively compared to control. Most of the female patients (67.4%) were involved in household jobs (data not shown).

Smoking was recorded only in the males of both groups. Depending on the number of cigarettes they smoked/day the subjects were categorized into 2 groups. Among MI patients 36 males (21.8%) smoked ≥ 10 cigarettes/day, and 9 (5.5%) ≤ 10 cigarettes/day compared to 29 (17.6%) in control.

BEHAVIORAL PATTERN

The behavioral pattern of subjects is shown in Table 4. When chi square test was applied between the hyperactive subjects in control and patients, values obtained ($\chi^2 = 11.6, p<0.001$) was highly significant. Similarly for trifle thinkers ($\chi^2 = 56.8, p<0.0001$), irrelevant thinkers ($\chi^2 = 115.74, p<0.0001$) and highly ambitious personality ($\chi^2 = 78.56, p<0.0001$) subjects in controls and cases were also highly significant.

The effect of behavioral pattern, sleep, brisk walking and stress induced in jobs on serum total cholesterol and blood pressure is shown in Table 5. Significant differences in total cholesterol levels were observed among control and cases in trifle thinkers, irrelevant thinkers and highly ambitious subjects. Significant differences were also observed in total cholesterol due to sleeping hours, brisk walking and hours of stress due to jobs.

The effect of socioeconomic strata on blood pressure and cholesterol levels is shown in Table 6. The cholesterol levels among control and cases were significant in all the three strata of subjects under study. When the blood pressure was compared between three strata in control and cases, significant differences were observed but it was higher in case of lower socioeconomic strata subjects. Majority of the AMI patients belonged to middle class (Table 6).

DISCUSSION

LIPID PROFILE

The present study was a hospital based study and was conducted in patients who were admitted to ICCU after developing symptoms of myocardial infarction (MI). Though dyslipidemia is considered as a conventional risk factors [21, 22, 23] so the study aimed to observe the effects of behavioral risk factors in normolipidemic AMI patients, which was isolated from the patients admitted in ICCU as per the criteria laid down by the regulatory body (NCEP-ATP-III) [17] .

In the current study significantly higher lipid profile were observed (Table 2) among patients when compared with age-sex matched healthy control, though all AMI patients were well within normal lipid range.

BEHAVIORAL PATTERN

The present study has revealed a substantially high prevalence of some of the behavioral and conventional risk factors in patients compared to controls, especially in smoking habits among men, physical inactivity, stress with employment, truncal obesity, low sleep duration, disturbance in sleep, obesity and hypertension, of which some are potentially modifiable (Table 3 and Table 5). In recent study among Chinese adults, reported both less (≤5hrs) and more (≥9hrs) sleeping hours compared to ≈ 7 hrs duration is a risk factor for cardiovascular disease [24] . Another study conducted on geriatric aged individuals also reported sleep disturbance as a cause of angina leading to cardiovascular disease [25] .

The study observed hyperactive, trifle thinker, irrelevant thinkers and highly ambitious personalities contributed the major risk in the myocardial infarction patients. This was indicated by significant difference in serum cholesterol and blood pressure among the patients compared to controls. Earlier studies reported that personality differences in individuals are risk factors as some individuals are more prone to coronary artery disease, which was correlated with angiography [26] . Even a comparative study between Indians and Chinese residing in Singapore, revealed stronger cardiovascular reactivity to stress among Indians than compared to Chinese men [27] , which may prove that Indians
are more vulnerable compared to other populations. A recent study conducted in USA recommends intensive lifestyle intervention in order to reduce future CVD events [39]. Anger and hostility induces heart instability by T-wave alternans, a marker of repolarization instability, predicts ventricular arrhythmias, moreover hypothalamus, pituitary and adrenal gland axis (HPA-axis) hyperactivity are also considered as a long term risk factors for cardiovascular disease and mortality due to CVD [31]. Reports from various other studies also suggested intensive lifestyle changes have resulted in reduction of cardiovascular disease associated with high risk lifestyle behaviors [30,31]. With lifestyle changes and healthy habits individuals not only survive longer but also they have a better life [30].

**PHYSICAL ACTIVITY**

In the current study, physical activity was lower in patients due to urbanization and sedentary lifestyle and most (86%) did not fulfill the minimum physical activity. When blood pressure and total cholesterol levels were analyzed in patients and controls, it was on higher side in patients with significant difference compared to controls and also when compared within patients with less and more physical activities the significant difference was observed in cholesterol and blood pressure. Studies conducted elsewhere [30] also concluded sedentary lifestyle reduces both arterial compliance and insulin sensitivity further predisposing individuals to cardiovascular diseases. The study recommended regular physical activity in prevention of cardiovascular disease in individuals of all age groups. Another study conducted in Ireland suggested three short bouts of brisk walk, each of 10 minutes duration accumulated throughout the day are at least as effective as one continuous bout of equal total duration in reducing cardiovascular risk and improving aspects of mood in previously sedentary individuals .. [31].

**EDUCATION AND SOCIOECONOMIC STATUS**

The higher incidences of AMI were observed in graduates compared to higher educated class. This finding is similar to the findings of numerous studies conducted elsewhere [30,31]. In the current study most of the subjects belonged to middle socioeconomic strata (71%) but significant difference in serum cholesterol and blood pressure was observed in lower socioeconomic strata compared to the other socioeconomic classes.

Education has an impact for health status because the current study observed that education is usually associated with increased knowledge about health matters and consequent reduction in risky health behaviors. Explanations for the differences in education levels were observed among those who died from CVD and include differences in risk factors such as blood pressure, blood cholesterol, smoking, and obesity (data not shown). Indeed, studies have observed that people with lower education levels smoke more [30] and have more hypertension [31].

As most of the patients were graduates (61%) and had low profile and stressful job. We analyzed serum cholesterol and blood pressure in the two groups of subjects and significant differences were observed. Most of them used public conveyance as a means of transport, where striding of traffic is obviously there, the individuals had to travel for longer duration to reach their work place which made their life more stressful which was supported by elevated cholesterol and blood pressure in patients compared to control. (Table 5).

**CONCLUSION**

In conclusion, our findings indicated a high prevalence of various behavioral risk factors among the myocardial infarct patients. Remedial measures are needed to minimize future morbidity burden and there by minimizing medical expenses. Regarding smoking, a strict public policy in restricting its use and its distribution may be considered, although the Government has taken steps in this regard, it is the individual and community who should make it effective. This is especially the case with high risk groups, mainly the lower social status groups.

**LIMITATIONS OF THIS STUDY**

The current study was a hospital based case controlled study and the participants were normolipidemic acute myocardial infarct patients who were admitted in ICCU and the variables were compared with the age-sex matched healthy control. Most of the patients were above sixty years of age (≈ 70%) so it is sort of study in elderly patients.

**WHAT THIS STUDY ADDS**

Over the past years, a large number of studies have been conducted in various parts of the world. This study compiles the behavioral patterns of Acute Myocardial Infarct patients from India and Sri Lanka. It is noticed that the middle socioeconomic strata are mainly affected and they carry the major burden of cardiovascular disease. The results of the
current study suggest stress, physical inactivity, sleep disturbances are the major behavioral patterns affecting the sub class of population leading to events of acute coronary syndromes and acute myocardial infarction.

**Figure 2**

Table 1. Anthropometric data of control subjects and MI patients

<table>
<thead>
<tr>
<th></th>
<th>Control group (n=165)</th>
<th>MI patients (n=165)</th>
<th>p-value (99% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>60.5 ± 3.8 (58-61)</td>
<td>61.8 ± 3.8 (61-72)</td>
<td>0.003 (61-26-62.82)</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>1.63 ± 0.09</td>
<td>1.64 ± 0.09</td>
<td>0.91 (1.61-4.64)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>68.34 ± 3.97</td>
<td>72.1 ± 3.57</td>
<td>&lt;0.001 (71.97-72.82)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>25.40 ± 1.20</td>
<td>26.16 ± 1.45</td>
<td>&lt;0.01 (25.82-26.38)</td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>91.76 ± 3.64</td>
<td>90.77 ± 3.79</td>
<td>&lt;0.001 (90.45-90.19)</td>
</tr>
<tr>
<td>Hip circumference (cm)</td>
<td>101.06 ± 1.16</td>
<td>105.72 ± 2.53</td>
<td>&lt;0.001 (104.92-106.45)</td>
</tr>
<tr>
<td>Waist-to-hip ratio</td>
<td>0.98 ± 0.03</td>
<td>0.99 ± 0.03</td>
<td>&lt;0.002 (0.99-0.94)</td>
</tr>
<tr>
<td>Waist to Hip ratio</td>
<td>99.12 ± 0.37</td>
<td>100.01 ± 1.18</td>
<td>&lt;0.005 (99.93-100.09)</td>
</tr>
<tr>
<td>Triiceps skin fold thickness (cm)</td>
<td>11.87 ± 1.17</td>
<td>11.85 ± 0.16</td>
<td>&lt;0.003 (11.83-13.14)</td>
</tr>
<tr>
<td>Subscapular skin fold thickness (cm)</td>
<td>11.40 ± 1.29</td>
<td>12.01 ± 1.16</td>
<td>&lt;0.012 (11.59-12.49)</td>
</tr>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>192.0 ± 1.59</td>
<td>202.5 ± 1.74</td>
<td>&lt;0.001 (192.1-169.56)</td>
</tr>
<tr>
<td>HDL cholesterol (mg/dl)</td>
<td>34.4 ± 0.4</td>
<td>34.6 ± 0.6</td>
<td>&lt;0.001 (34.68-34.97)</td>
</tr>
<tr>
<td>Triglycrides (mg/dl)</td>
<td>107 ± 11.25</td>
<td>120 ± 12.32</td>
<td>&lt;0.000 (120.1-124.8)</td>
</tr>
<tr>
<td>LDL cholesterol (mg/dl)</td>
<td>83.6 ± 12.9</td>
<td>119.4 ± 14.1</td>
<td>&lt;0.001 (117.24-122.5)</td>
</tr>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>22.0 ± 3.2</td>
<td>22.0 ± 3.2</td>
<td>0.01 (20.39-23.74)</td>
</tr>
</tbody>
</table>

Values are in Mean ± SD; Lipid profiles were determined in serum

**Figure 3**

Table 2. Lipid Profile and biochemical parameters in control subjects and MI patients

**Figure 4**

Table 3. Socioeconomic and lifestyle characteristics of study and control subjects

<table>
<thead>
<tr>
<th></th>
<th>Control group (n=165)</th>
<th>Study group (n=165)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>60.5 ± 3.8 (58-61)</td>
<td>61.8 ± 3.8 (61-72)</td>
</tr>
<tr>
<td>Range (years)</td>
<td>46.5 (42-58)</td>
<td>48.5 (42-60)</td>
</tr>
<tr>
<td>Civl status</td>
<td>Lower Class</td>
<td>Middle Class</td>
</tr>
<tr>
<td></td>
<td>Highers Class</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19 (11.31)</td>
<td>12 (7.27)</td>
</tr>
<tr>
<td>Female</td>
<td>131 (79.36)</td>
<td>117 (79.39)</td>
</tr>
<tr>
<td>Type of family</td>
<td>Spilt</td>
<td>Joint</td>
</tr>
<tr>
<td></td>
<td>101 (61.21)</td>
<td>143 (87.87)</td>
</tr>
<tr>
<td>Education</td>
<td>Below Mariculate</td>
<td>Higher-Secandary</td>
</tr>
<tr>
<td></td>
<td>12 (7.77)</td>
<td>15 (9.89)</td>
</tr>
<tr>
<td></td>
<td>Graduated</td>
<td>132 (80.96)</td>
</tr>
<tr>
<td></td>
<td>Post Graduate</td>
<td>101 (61.21)</td>
</tr>
<tr>
<td>Type of work</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>58 (35.15)</td>
<td>82 (50.60)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>100 (60.60)</td>
</tr>
<tr>
<td>Walking (min)</td>
<td>≤ 180 min/hk</td>
<td>142 (86.06)</td>
</tr>
<tr>
<td></td>
<td>&gt; 180 min/hk</td>
<td>43 (26.06)</td>
</tr>
<tr>
<td>Hours of sleep</td>
<td>≤ 7 hours/day</td>
<td>88 (53.31)</td>
</tr>
<tr>
<td></td>
<td>&gt; 7 hours/day</td>
<td>59 (35.75)</td>
</tr>
<tr>
<td>Smoking</td>
<td>≤ 10 cigarettes/day</td>
<td>43 (26.06)</td>
</tr>
<tr>
<td></td>
<td>&gt; 10 cigarettes/day</td>
<td>29 (17.77)</td>
</tr>
<tr>
<td>Hours of travelling in work place</td>
<td>≤ 10 hours/day</td>
<td>&gt; 10 hours/day</td>
</tr>
<tr>
<td></td>
<td>28 (13.33)</td>
<td>78 (47.27)</td>
</tr>
<tr>
<td>Hours of stress in job</td>
<td>≤ 4 hours/day</td>
<td>89 (55.81)</td>
</tr>
<tr>
<td></td>
<td>&gt; 4 hours/day</td>
<td>122 (74.54)</td>
</tr>
</tbody>
</table>

Values are in mean ± SD; Numbers in parentheses indicate number of subjects

Reference

25. Newman AB, Enright PL, Manolio TA, Haponik EF, Wahl PW.Sleep disturbance, psychosocial correlates, and cardiovascular disease in 5201 older
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