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## Occupational Stress, Dietary and Socio Economic Factors in a Patient with Hypertension-An Indian Perspective

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### ABSTRACT

The etiology of hypertension is multifactorial and is strongly associated with behavioral and multiple genetic factors. Despite these non-modifiable risk factors, the role of chronic stress and psychosocial factors like impaired social support, anxiety, depression contributing to the development of hypertension must always be considered. There is compelling evidence suggesting the role of chronic stress and psychosocial factors in the development of hypertension. Further studies are to be undertaken to establish a causal relationship and the role of preventive measures stress induced hypertension. The clinician treating patients with hypertension must always consider the role of chronic stress and associated psychosocial factors.

**Keywords:** Diet, Blood pressure, Smoking, Alcohol

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## INTRODUCTION

Hypertension, defined as persistently elevated blood pressure of >140 mm of Hg systolic and >90mm of Hg diastolic on 2 or more occasions is one of the leading non-communicable diseases. The etiology of hypertension is multifactorial and is strongly associated with behavioral and multiple genetic factors. Despite these non-modifiable risk factors, the role of chronic stress and psychosocial factors like impaired social support, anxiety, depression contributing to the development of hypertension must always be considered.

Indian cuisine is diverse and Indian dietary habits depend on umpteen factors like environmental, religious, cultural and socio economic background. Thus, the role of individual dietary habits and the composition of Indian food like the dietary salt content must be borne in mind. Smoking, alcohol consumption and sedentary lifestyle are well known risk factors to develop hypertension. From a clinician's perspective, the possibility of white coat hypertension must also be considered especially among patients during their first visit. These risk factors being modifiable are of utmost importance as they provide an opportunity for preventive measures. The role played by these factors in the development of hypertension in the Indian population is discussed subsequently from a clinician's perspective.

It is well known that acute stressors lead to transient elevations in blood pressures due to sympathetic stimulation. Along these lines, it may be hypothesized that sustained elevations in blood pressure may be contributed by chronic stress. One of the hypotheses is the delayed recovery of cardio vascular reactivity to pre stress levels among individuals with chronic stress induced hypertension.

Chronic stress may be stress that is related to the working environment, socio-economic status and due to stress in relationships. Despite the influence of each of these elements in the development of hypertension have been established, many questions remain unanswered. These include ambiguity in the exact mechanism of chronic stress induced hypertension and the role of preventive factors.

## WORK RELATED STRESS AND HYPERTENSION

India being among the low and middle-income countries, a smaller proportion of healthy work force will have to take responsibility for a large and aging population [1]. This causes additional social and financial burden and ultimately contribute to increasing stress among healthy individuals. Considerable numbers of studies have shown that work stress and strain are associated with musculoskeletal, cardio vascular and psychological disorders [2].

India is now one of the biggest Information technology (IT) and Information Technology Enabled Services (ITES) capital of the modern world. Major players in the world IT sector are present in the country and the city of Bengaluru is known as the IT hub of India. The onset of hypertension among Asians is a decade earlier than in the western population [3]. Nevertheless, it has been shown that the onset of hypertension among IT/ITES professionals occurred even a decade earlier than the rest of Indian population [4].

The study was undertaken in the city of Bengaluru and showed the prevalence of hypertension was found to be at an alarming 31% with approximately 5% having malignant hypertension. It involved 27 different IT companies with a study population of 1071 subjects. Another frightening observation was that 46% of the subjects had prehypertension. Interestingly, the odds of getting hypertension was inversely related to their professional work, with prevalence of hypertension highest with lesser work experience than those with those who worked more than 12 years. IT professionals have desk-bound working, sedentary lifestyles, bizarre sleep patterns and time constraints to actively engage with their families leading to weakened social support making them at high risk for non-communicable diseases [5].

These results are disturbing and warrant immediate measures to prevent development of cardiovascular diseases among IT professionals at an early age. IT companies must initiate health education programs and stress management programs for employees which would ultimately translate into retaining costs on health expenditure, superior capacity and productivity of the company.

Comparable outcomes have been attained with studies done in the line of work with levels of work stress and sedentary lifestyles. Maroof et al. established high rate of prevalence of hypertension (69.5%)

among bank employees in Meerut, India [6]. Similarly, the role of work stress among policeman as a risk factor for developing hypertension and other non-communicable diseases was established in the study conducted by Kamble SV in Rahtaka taluq of Ahmednagar district [7].

Likewise, the role of working conditions among employees was established in the study conducted by Tiwai R et.al, in the city of Wardha. The study conducted among cotton textile workers found the prevalence of hypertension to be as high as 20% of its employees. Hypertension was found to be higher in individuals working in noisy department and those working in the cotton textile industry for greater than 10 years [8].

#### **PREVENTION OF HYPERTENSION AMONG PEOPLE WITH HYPERTENSION DUE TO WORK STRESS**

Is there any way of curtailing the alarming prevalence of hypertension amongst the working class? A thought provoking study was conducted by Christopher millet et.al on the manner of active commutation to work and relationship with non-communicable diseases [9]. The study involved a total of 3,902 participants working in both urban and rural areas and were assessed regarding their mode, duration of travel to work and presence of other cardiovascular risk factors and matched for age, gender, occupation, caste, standard of living, factory location, leisure time physical activity, smoking and alcohol habits, daily fat intake. The results of the study were overwhelming and thought provoking. Rural inhabitants used bicycle to work than their urban counterparts. The prevalence of all non-communicable diseases was less among individuals walking or bicycling to work than among those using individual transit system. The risk was even less among individuals who had longer period of bicycling to their work. The study is an eye-opener and efforts should be made to increase physical activity by means of active travel like bicycling, walking to work place. Sufficient safety measures and convenience like bicycle parking areas must be provided to encourage people to indulge in bicycling and walking to work place in urban and rural areas.

#### **INDIAN DIET AND HYPERTENSION**

The salt content in Indian cuisine depends on diverse origins like salt used in direct cooking, and added salt as in pickles, papad. The role of dietary salt intake and its association with the development of hypertension was determined by Radhika et.al [10]. The study conducted in the city of Chennai included 1902 subjects and the intake of dietary salt micro and macronutrients was calculated. The mean salt intake was found to be higher (8.5g/day) than the recommended 5g/day and was associated with an increased risk of hypertension. The study also demonstrated an increase in both systolic and diastolic blood pressure with increased salt intake among both hypertensive as well as normotensive subjects. Notably, the increased fatty and salty foods intake was seen among better income people due to the habit of eating out, especially at the fast-food restaurants. Thus, sincere efforts must be developed to educate people regarding hazards of excess salt in diet and to avoid consuming junk foods that have not only a high content of salt, but also a substantial amount of sugar and fat.

Another intriguing study was conducted by Chiplonkar S et.al, on the possible role of micronutrient deficiencies leading and risk of hypertension among vegetarian Indian adults [11]. Increase in oxidative stress due to deficiency of micro nutrients zinc, folic acid and vitamin C levels were plausible risk factors for developing hypertension.

#### **ROLE OF SOCIAL STATUS AS A RISK FACTOR FOR DEVELOPING NON-COMMUNICABLE DISEASES**

In a study performed by Singh et.al, in the city of Moradabad in North India, it was found that people with higher socio-economic status had higher prevalence of hypertension, obesity and dyslipidemia [12]. Identical outcomes were observed among the socially higher class living in 2 villages in the same district of Moradabad [13]. It was also contemplated that the prevalence of hypertension was higher in the urban population even among the people with the same ethnic background [14].

In yet another intriguing study conducted by Yip et.al, the prevalence of hypertension was compared among South Asian Indians living in two geographic regions-Singapore and rural India. The results were striking with higher level of hypertension detected among Indians living in Singapore compared to their rural counterparts [15]. The level of awareness on hypertension and treatment was more among Indians in

Singapore. These studies call for urgent needs to establish public health strategies among the affluent class to curb the alarming acceleration in the prevalence of hypertension and other non-communicable diseases.

Nonetheless, people living in urban slums are also at an immense risk of developing non-communicable diseases. In a study done by Tushar et.al in the urban slums of North 24 Paraganas district, West Bengal, the prevalence of hypertension was found to be an alarming 35% among men and 33% of women [16]. The study involved 1052 participants dwelling over 24 slums. Smoking and alcohol consumption seen in almost 50% of men were the most significant risk factors for developing hypertension. Diet deficient in fruits and vegetables was consumed, presumably due to the high cost. Health promotion and awareness programs addressing cessation of smoking and de-addiction of alcohol along with strengthening of primary health care facilities should be undertaken in the urban slums in India.

### **ROLE OF YOGA IN HYPERTENSION**

June 21 every year henceforth will be celebrated as “International Yoga day” as declared by the United Nations general assembly. It is a matter of pride for Indians as Yoga is a physical, mental, and spiritual practice or discipline that originated in India. There have been considerable studies demonstrating the beneficial effect of Yoga in the control of hypertension. In a study conducted by Bhavanani et.al, pranayama-based breathing training was shown to be effective in reducing blood pressure [17]. The likely explanation is that pranayama therapy increases the vagal tone and reduces sympathetic activity with enhanced production of nitric oxide, which is a potent vasodilator. Further large-scale studies and research is essential in establishing the benefits of Yoga therapy, which can prove to be a simple and cost effective modality in the treatment of hypertension.

### **CONCLUSION**

There is compelling evidence suggesting the role of chronic stress and psychosocial factors in the development of hypertension. Further studies are to be undertaken to establish a causal relationship and the role of preventive measures stress induced hypertension. The clinician treating patients with hypertension must always consider the role of chronic stress and associated psychosocial factors.

To conclude, we would like to quote Sir Tinsley Randolph Harrison, one of the most eminent physicians and authors of the applauded textbook *Harrisons principles of internal Medicine*- “No greater opportunity, responsibility, or obligation can fall to the lot of a human being than to become a physician. In the care of the suffering, [the physician] needs technical skill, scientific knowledge, and human understanding. Tact, sympathy, and understanding are expected of the physician, for the patient is no mere collection of symptoms, signs, disordered functions, damaged organs, and disturbed emotions. [The patient] is human, fearful, and hopeful, seeking relief, help, and reassurance” —Harrison's Principles of Internal Medicine, 1950.

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