

ORIGINAL RESEARCH

Study of correlation between stress and risk factors of hypertension: An original research

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ABSTRACT

Aim: The purpose of the present research was to assess the co-relation between stress and hypertension.

Methodology: In this correlation study 30 individuals were selected. Basic demographic data was collected and were asked to fill up the Perceived stress scale. Blood pressure was measured at the brachial artery three times and average of the three was taken. To study the relation between stress score and BP, correlation was done. As data were not normally distributed, Spearman correlation test was done ($P < 0.001$).

Results: According to the analysis done, PSS shows moderate correlation with SBP while DBP shows weak correlation with r values 0.47 and 0.202 respectively and p values 0.806 and 0.283 respectively.

Conclusion: Stress is significantly related to hypertension and is an independent risk factor for hypertension.

Keywords: Blood pressure, hypertension, stress, perceived stress score, correlation.

INTRODUCTION

The blood pressure (BP) is the pressure that the blood flow exerts against the walls of blood vessels. It varies in the different parts of the human body according to the phases of contraction of heart and to the conditions of health, exercise, stress, etc. If the term BP is used without further specification, usually refers by antonomasia to the arterial pressure in the systemic circulation. BP is usually expressed in terms of the systolic BP (SBP, maximum pressure), over diastolic BP (DBP, minimum pressure). It is usually measured at a person's upper arm and is measured in millimeters of mercury (mmHg) because the traditional device used to measure BP, a sphygmomanometer, used a glass column filled with mercury and

calibrated in millimeters. Normal resting BP in an adult is within the range of 100–140 mmHg systolic and 60–90mmHg diastolic.¹ Moreover, during the last two decades, pulse pressure (PP), defined as the difference between SBP and DBP within a normal range of 30–80mm Hg, has received growing attention as an independent predictor of cardiovascular risk. Some authors, in a meta-analysis of 2,000 combining studies that previously examined over 8,000 elderly subjects, demonstrated that the risk of major cardiovascular complications and mortality increased by nearly 20% within an increase of 10mmHg in PP.² On the other hand, studies on young adults are still meager and results often contradictory, therefore motivating the increasing need of researching on these subjects in order to fulfil an adequate prevention of such in validating diseases. Hypertension (HTN) is either defined as a transitory or persistent elevation of arterial BP with, arbitrarily, a systolic measures >160 mmHg or more and diastolic measures >90 mmHg. HTN represents a worldwide problem afflicting more than a quarter of the world's adult population, in both developed (333 million) and in developing countries (639 million). It represents a major preventable risk factor for premature death and disability and, in particular, a crucial risk factor in the development of cardiovascular diseases (CVDs), such as hypertensive heart disease, coronary artery disease, stroke, aortic aneurysm, peripheral artery disease, cerebrovascular disease, and chronic kidney disease.³⁻⁵ Coronary heart diseases (CHDs) in men are negligible until the age of 40 years, they emerge between 40 and 50 years and then grow exponentially with age; in women occur at ages 50–60 years and grow rapidly. The disadvantage of men compared to women is more pronounced in young people and tends to decrease with age: the lowest frequency of ischemic heart disease in women than in men is particularly evident in their productive age. The prevalence difference between the sexes is accompanied by differences in clinical manifestations: women suffer, in fact, more frequently from sudden death, silent heart attack, and angina pectoris.⁶ Stress has become a part of our life due to hectic lifestyle that we have and so is the lifestyle disorders like hypertension. The aim of this study is to find the correlation between blood pressure and perceived stress and how they are related.

AIM OF THE PRESENT STUDY

The purpose of the present research was to assess the co-relation between stress and hypertension in individuals.

METHODOLOGY

In this correlation study, OPD based patients with blood pressure $\geq 120/80$ or k/c/o HTN or newly diagnosed HTN were invited to be the part of the study. The participation was voluntarily. Out of them 30 individuals agreed to participate. Details about the study were given and oral consent was taken. Basic demographic data was collected and were asked to fill up the Perceived stress scale. Blood pressure was measured at the brachial artery three times and average of the three was taken. Psychiatric co-morbidities, heart failure cases were excluded. Outcome was to evaluate systolic and diastolic blood pressures (SBP, DBP) and Perceived stress score (PSS). Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) 25. To study the relation between stress score and BP, correlation was done. As data were not normally distributed, Spearman correlation test was done ($P < 0.001$).

RESULTS

30 participants were included in the study. In this 20 were males and 10 were females. According to the analysis done, PSS shows moderate correlation with SBP while DBP shows weak correlation with r values 0.47 and 0.202 respectively. (Table 1)

Table 1- Correlation of PSS with SBP and DBP

	PSS with SBP	PSS with DBP
r	0.47	0.202
p	0.806	0.283
Correlation	Moderate	Weak

Females showed better correlation of PSS with SBP and DBP compared to male with r values 0.386, 0.291, 0.264 and 0.107 respectively. (Table 2,3)

Table 2- Correlation of PSS with DBP

	Female	Male
r	0.264	0.107
p	0.461	0.654
Correlation	Weak	Very Weak

Table 3- Correlation of PSS with SBP

	Female	Male
r	0.264	0.107
p	0.461	0.654
Correlation	Weak	Very Weak

DISCUSSION

Stress is defined as a condition in which an organism's adaptive capacity is strained, resulting in both psychological and biological alterations that may put them at risk for sickness. The link between stress and hypertension has long been hypothesised, as blood pressure and serum cholesterol rise during stressful situations.⁷ The perceived stress scale was employed in this study to assess stress. It was first created in 1983. It enables us to comprehend how various conditions influence our emotions and stress levels. This scale's questions focus on feelings and thoughts from the previous month.⁸ In the present study, high stress was significantly associated with hypertension. While there is moderate correlation with SBP, DBP showed weak relationship which is supported by Garda Vera et al⁹ where the sustained hypertension group showed more stress than the normotensive group in a research. High stress levels were found to be related with hypertension in the current study, while growing stress levels were not. Lin et al¹⁰ found the opposite, finding a link between stress levels and hypertension development. There is giant proof to signify that excessive BP is related to continual strain and the manner wherein humans cope. Chronic mental strain is related to expanded activation of the sympathetic-adrenomedullary axis and expanded circulating ranges of adrenaline and noradrenaline. Chronically improved adrenaline ranges had been implicated with inside the improvement and development of and hypertensive topics had been established to have expanded sympathetic and decreased parasympathetic tone as compared to wholesome controls. Conversely, behavioral interventions that lessen strain and sympathetic arousal had been proven to be powerful nonpharmacologic remedies for hypertension; such remedies had been related to clinically vast and sustainable BP discounts in addition to decreased fitness care costs.¹¹ However, there is evidence that controlling some types of stress can be extremely beneficial in the treatment and prevention of essential hypertension.¹² We discovered an mild connection between self-perceived stress and SBP in this study. This relationship is found in both men and women. While females showed weak positive correlation between stress and both SBP and DBP, males showed weak correlation between stress and SBP and very weak correlation between stress and DBP. This association has nothing to do with age and/or weight. Patients receiving antihypertensive therapy did not show this relationship. No to very weak relationship was found between DBP and stress

score. Suter et al. found that individual stress perception was inversely associated to systolic blood pressure (SBP). There was no link discovered between diastolic blood pressure (DBP) and stress perception. In addition to the psychophysiological factors, other stress management strategies can further promote the development of hypertension. Some of these coping mechanisms, especially smoking, drinking, and overeating, can partially and temporarily help control stress, but at the cost of a higher risk of hypertension.¹³ In this study, we found that there is a moderate relationship between self-perceived stress and SBP. We suspect that the relationship between blood pressure and self-perceived stress reflects the psychological and metabolic environment characterized by insufficient stress management, which can lead to increased blood pressure.

CONCLUSION

The study found that stress is significantly related to hypertension and is an independent risk factor for hypertension.

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