

PREVALENCE OF PREHYPERTENSION IN MEDICAL PROFESSIONALS OF JAMMU

Dr Veena Gupta (Sr. Resident) (1), Dr Sunny Gupta (Consultant)(2), Dr Rupali Parlewar (Prof.)
Deptt of Physiology, DRPGMC, Kangra at Tanda ,Himachal pradesh
Corresponding Author: Dr Rupali Parlewar; Email ID- rupalifulzele@gmail.com

ABSTRACT**Background**

Prehypertension (PHT) leads to hypertension (HT) and is closely associated with increased incidence of cardiovascular disease risk (CVD). Prevalence of Prehypertension in medical professionals can give an idea of their risk of progression to (HT), so as to reduce the burden of (HT) and CVD.

Objectives- Prevalence of Prehypertension among Medical professionals of Jammu and comparison of prevalence among males and females of medical professionals of Jammu.

Materials and Methods- The aim was to estimate the prevalence of prehypertension in medical professionals of Jammu city and comparison of prevalence of prehypertension in both males and females. The study included 184 medical professionals from Medical Colleges of Jammu region. The blood pressure was recorded by auscultatory method using mercury sphygmomanometer.

Results- Prevalence of Prehypertension in study population was 74.46 %(males- 92.73%, females- 6.67%) which was stastically highly significant.

Conclusion- Above results shows that there is , High Prevalence of Prehypertension among the medical Professionals , indicative of vigorous preventive measures to be taken so that the risk of progression to Hypertension and subsequent Cardiovascular diseases to be curtailed

Keywords- Systolic/ Diastolic Blood Pressure (SBP/DBP), Prehypertension (PHT).

**PREVALENCE OF PREHYPERTENSION IN
MALE AND FEMALE MEDICAL PROFESSIONALS OF JAMMU**

INTRODUCTION

Prehypertension is a precursor of clinical hypertension and is closely associated with increased incidence of cardiovascular disease. Patients with prehypertension have increase risk of cardiovascular related morbidity and mortality as compared to patients having normal blood pressure (<120/80 mmHg) **(1)**

Greek physician Galen said, *'That the physician will hardly be thought very careful of the health of his patients if he neglects his own'*. Lack of time, sedentary lifestyle and higher socio-economic status could explain the propensity for increased risk among physicians **(2)**.

Hypertension is often regarded as a disease of civilization, on the grounds that it is relatively uncommon in traditional village societies but becomes more prevalent when people adopt urban lifestyles. **(3)**

Relative to normotensive subjects, the risk of hypertension was substantially higher among subjects with "high normal" BP *i.e.*, 130 to 139 (SBP) and 85 to 89 (DBP) mmHg **(4)**.

Increase left ventricular mass in prehypertension is possibly associated with greater hemodynamic load. Pressure variability or prolonged sustained exposure to higher blood pressure during daily activities could explain the greater value of left ventricular mass in prehypertensives **(5)**.

Higher levels of trait anger in middle aged prehypertensive men were associated with increased risk of progressing to hypertension and incident coronary heart disease. Biological mechanisms as sympathetic hyperactivity and arousal associated with anger and psychological stress may play a role **(6)**.

Elevated blood pressure in prehypertension results from increase cardiac output, driven by contractility as well as heart rate and may reflect both diminished parasympathetic and increase sympathetic function. In face of increase cardiac output, systemic vascular resistance falls to decline homeostatically. Such trails display substantial heritability and shared genetic determination and clarify role of hereditary in origin of prehypertension and hemodynamic pathogenesis **(7)**.

Hence , in the present study we have focused on prevalence of prehypertension in medical professionals of Jammu to prevent progression of prehypertension to hypertension. Also we have emphasized on Prevalence of Prehypertension in males compared to females, so that attention will be focused on highly affected group.

Harris et al. (1953) suggested that prehypertensive individuals were more vulnerable in situations involving psychological stress and hence more subject to the autonomic concomitants of emotions including repetitive rises of blood pressure.**(8)**

Leitschuh et al. (1991) determined that individuals with high-normal blood pressure progressed to hypertension two to three times more frequently than those with normal blood pressure, thus advancing to a higher cardiovascular risk category.(9)

AIMS AND OBJECTIVES

- 1 To estimate Prevalence of Prehypertension in medical professionals of Jammu.
- 2 Comparison of Prevalence of Prehypertension in both males and females.

MATERIALS AND METHODS

The aim was to estimate the prevalence of Prehypertension in medical professionals of Jammu city and comparison of Prevalence of Prehypertension in both males and females.

The study included 184 medical professionals from Medical Colleges of Jammu region. They were grouped in to males and females. All the subjects were requested to present themselves in Postgraduate Department of Physiology, Government Medical College, Jammu. Subjects were instructed not to take fatty, fried and heavy diet 2 days prior to test. Written consent was obtained from all the subjects participating in the study. Male and female subjects consenting to participate in the study were explained all aspects of the project in detail to eliminate their fear and apprehension.

Exclusion criterion

- Subjects with Diabetes mellitus, Hypertension, obesity and Hypothyroidism
- Smokers and alcoholics
- Subjects with history of cardiovascular disorders

The Blood Pressure was recorded by auscultatory method using mercury sphygmomanometer. Subject was made to sit and after a gap of 5min, the cuff of blood pressure apparatus was placed around the upper arm with the centre of bag lying over the brachial artery, keeping its lower edge about 3 cm above the elbow. The chest piece of the stethoscope was placed at the level of bifurcation of brachial artery. Cuff was inflated and pressure was raised to about 40 to 50 mmHg above systolic blood pressure (found by palpatory method). The pressure was

lowered gradually until a clear tapping sound was heard which was taken as systolic blood pressure. The pressure was further lowered and the level at which sound became muffled was taken as diastolic blood pressure. Mean of the three readings were taken **(10)**.

Prehypertension was defined as systolic blood pressure 120-139 mmHg and/or diastolic blood pressure 80-89 mmHg. Hypertension was taken as systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg **(11)**.

Plan of analysis

Data were analyzed using computer software MS Excel for Windows and EPI info version 6.1. Results were expressed as mean \pm standard deviation. Student's t-test was used to compare the parameters between normotensives and prehypertensives. Correlation analysis was done using Karlpearson's method. A 'p'-value of less than 0.05 was considered as statistically significant.

OBSERVATIONS & RESULT

The present study was carried on 184 medical professionals of either sex from the medical colleges of Jammu region. Following observations were made.

Table 1: Gender distribution of subjects into Normotensive and Prehypertensive groups with respect to both SBP and DBP

| SBP and DBP (mmHg) | Male (n=55) | | Female (n=129) | | Total (n=184) | |
|--|----------------|---------------|-------------------|---------------|------------------|---------------|
| | No. | % | No. | % | No. | % |
| Normotensive (SBP<120, DBP<80) | 4 | 7.27 | 43 | 33.33 | 47 | 25.54 |
| Prehypertensive (SBP 120-139, DBP ≥ 80) | 51 | 92.73 | 86 | 66.67 | 137 | 74.46 |
| Total | 55 | 100.00 | 129 | 100.00 | 184 | 100.00 |

The above table shows gender distribution of subjects into normotensive and prehypertensive groups with respect to both systolic and diastolic blood pressures.

- Prevalence of prehypertension in study population is 74.46%.
- Number of male and female normotensive subjects are 4 (7.27%) and 43 (33.33%) respectively.
- Number of male and female prehypertensive subjects is 51 (92.73%) and 86 (66.67%) respectively.
- Thus, out of 184 subjects included in the study, 47 (25.54%) were normotensives and 137 (74.46%) were prehypertensive

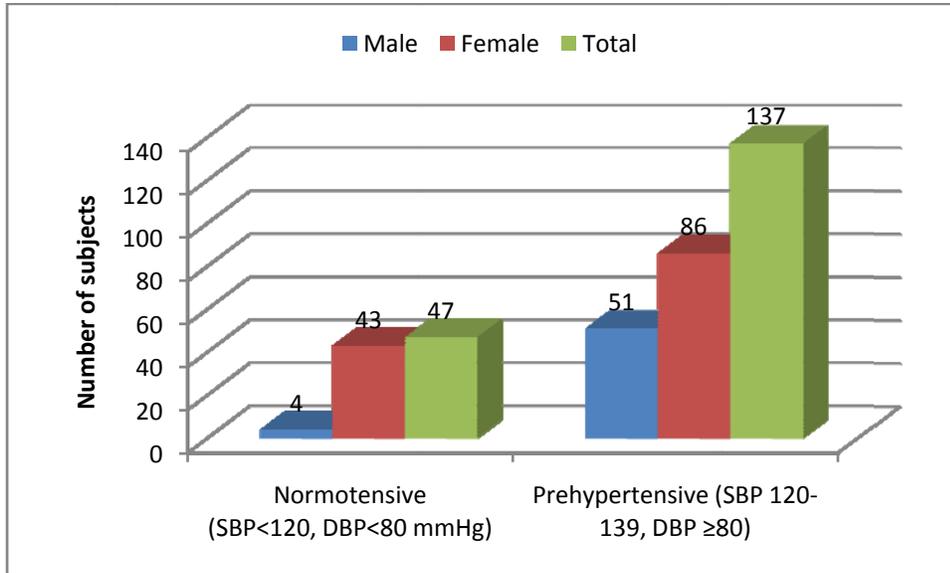


Fig. 1: Bar chart showing Gender distribution of subjects into Normotensive and Prehypertensive groups with respect to both SBP and DBP

Table 2: Comparison of Systolic blood pressure (SBP) of Normotensive and Prehypertensive subjects

| Study Groups | SBP (mmHg) Mean ± Standard deviation | Equality of means 't'-value | Statistical inference (2-tailed) |
|--------------|---|--------------------------------|-------------------------------------|
| | | | |

| | | | |
|-------------------------|---------------|--------|-------------------------------|
| Normotensive (n=47) | 110.63 ± 2.95 | -13.91 | p=.000; Highly significant |
| Prehypertensive (n=137) | 122.11 ± 5.70 | | |

The above table shows comparison of mean systolic blood pressure (SBP) of normotensive and prehypertensive subjects.

- Mean SBP of normotensive subjects is 110.63 ± 2.95 mmHg and that of prehypertensive subjects is 122.11 ± 5.70 mmHg.
- The difference between the two groups is statistically highly significant (p=.000).

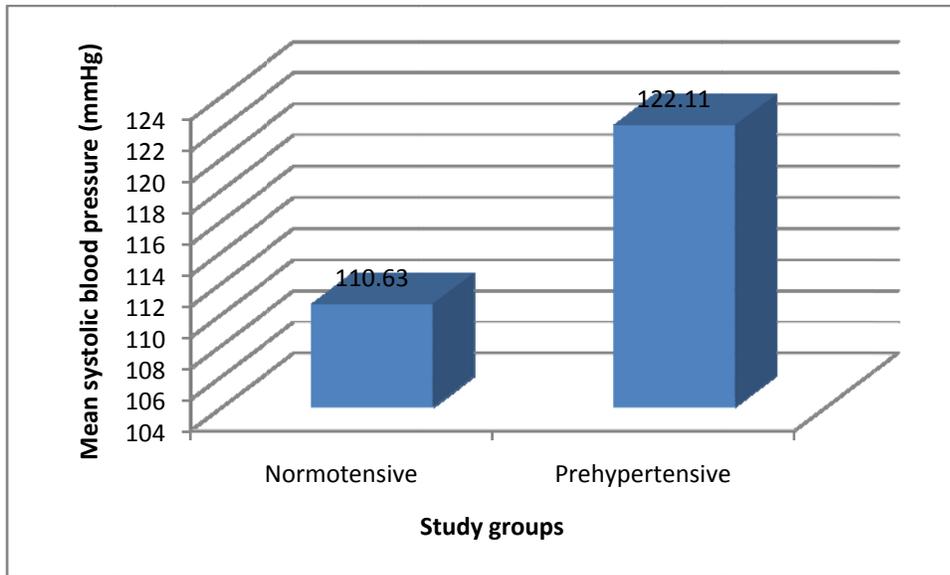


Fig. 5: Bar chart showing means Systolic blood pressure of Normotensive and Prehypertensive subjects

Table 3: Comparison of Diastolic blood pressure (DBP) of Normotensive and Prehypertensive subjects

| Study Groups | DBP (mmHg) | Equality of means 't'-value | Statistical inference (2-tailed) |
|-------------------------|---------------------------|--------------------------------|-------------------------------------|
| | Mean ± Standard deviation | | |
| Normotensive (n=47) | 70.63 ± 3.15 | -9.80 | p=.000; Highly significant |
| Prehypertensive (n=137) | 81.27 ± 7.19 | | |

The above table shows comparison of mean diastolic blood pressure (DBP) of normotensive and prehypertensive subjects.

- Mean DBP of normotensive subjects is 70.63 ± 3.15 mmHg and that of prehypertensive subjects is 81.27 ± 7.19 mmHg.
- The difference between the two groups is statistically highly significant ($p=0.00$).

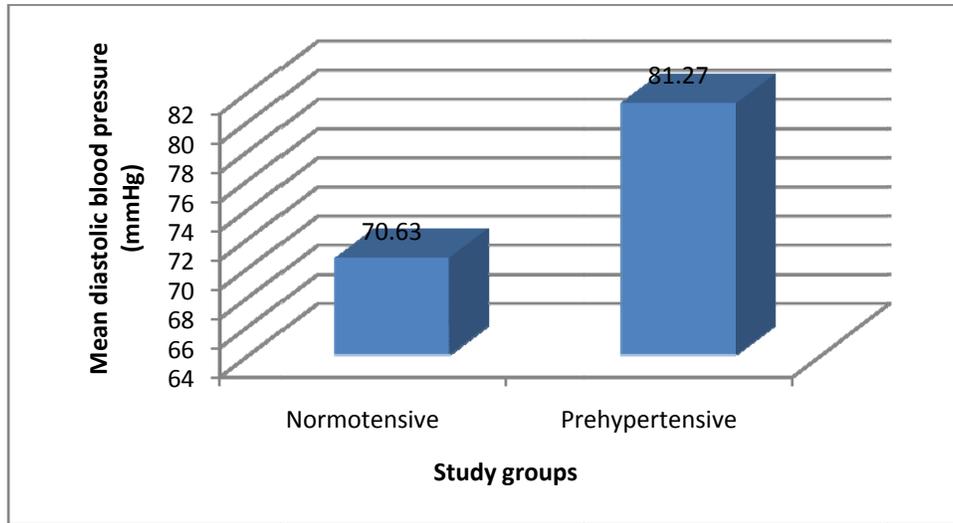


Fig. 3: Bar chart showing Mean Diastolic blood pressure of Normotensive and Prehypertensive subjects

Table 4: Comparison of Systolic blood pressure (SBP) of Male and Female subjects

| Study Groups | SBP (mmHg) | Equality of means 't'-value | Statistical inference (2-tailed) |
|-------------------|-------------------------------|--------------------------------|-------------------------------------|
| | Mean \pm Standard deviation | | |
| male (n=55) | 125 ± 8.69 | 6.156 | p=0.00; Highly significant |
| Female (n=129) | 117 ± 7.28 | | |

The above table shows comparison of mean systolic blood pressure (SBP) of male and female subjects.

- Mean SBP of male subjects is 125 ± 8.69 mmHg and that of female subjects is 117 ± 7.28
- The difference between the two groups is statistically highly significant($p=0.00$)

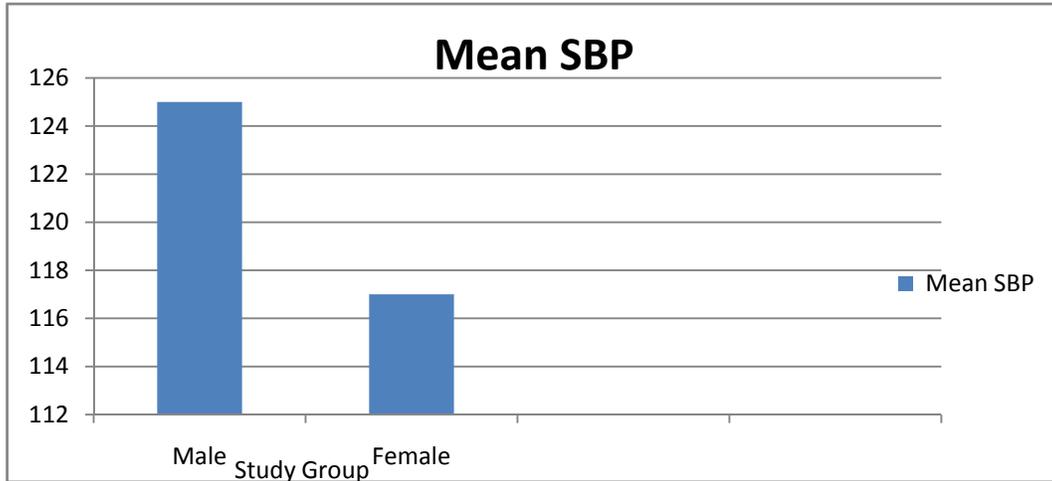


Fig. 4: Bar chart showing means Systolic blood pressure of Male and Female subjects

Table 5: Comparison of Diastolic blood pressure (DBP) of Male and Female subjects

| Study Groups | DBP (mmHg) | Equality of means | Statistical inference |
|-------------------|-------------------------------|-------------------|-------------------------------|
| | Mean \pm Standard deviation | 't'-value | (2-tailed) |
| male (n=55) | 84 \pm 7.45 | 7.105 | p=0.00; Highly significant |
| Female (n=129) | 76 \pm 7.68 | | |

The above table shows comparison of mean diastolic blood pressure (DBP) of male and female subjects.

- Mean diastolic blood pressure of male subjects is 84 \pm 7.45 and that of female subjects is 76 \pm 7.68
- The difference between the two groups is statistically highly significant (p=0.00)

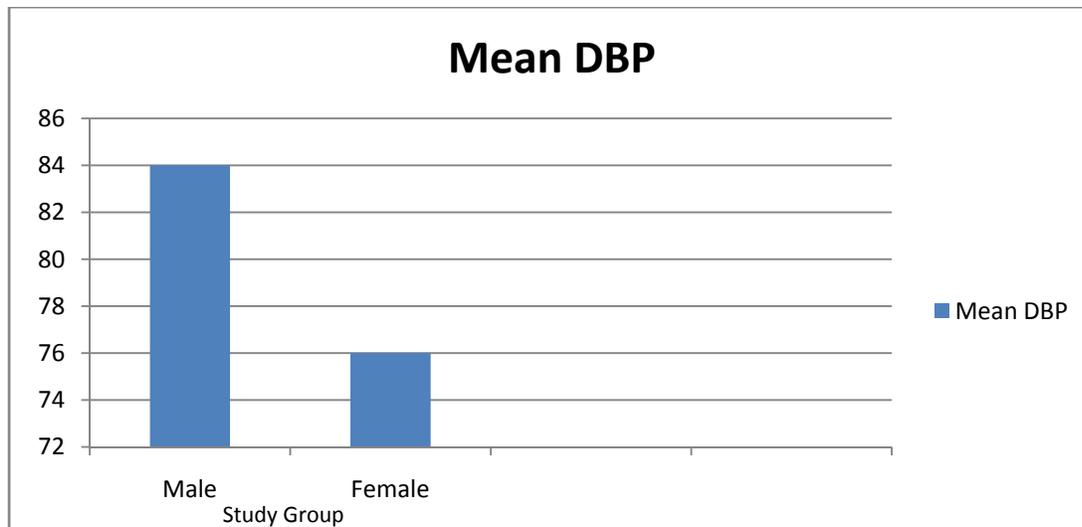


Fig. 5: Bar chart showing means Diastolic blood pressure of Male and Female subjects

DISCUSSION

From our study we observed that out of total (184) subjects, most of them were in the age group of 25-30yrs. Out of which 30% were males and 70% were females. It was found that out of total subjects examined 74.46% were Prehypertensive which is statistically significant. This indicates that there is high prevalence of Prehypertension among the medical Professionals, indicative of vigorous preventive measures to be taken so that the risk of progression to hypertension and subsequent Cardiovascular diseases to be curtailed.

In our study it is also found that Prevalence of Prehypertension in males is 92.73% , and that in females is 66.67% which is stastically significant. This shows that males are at higher risk of Hypertension as compared to females.

Similar result was given by **Pang et al. (2008)**, who conducted a study on 45,925 adults of Chinese rural population and found that prevalence of prehypertension was higher in males than females (48.7% vs 39.6%).**(12)**

Our finding are similar to those of **Janghorbani et al. (2008)**, who studied blood pressure and associated risk factors of 35,048 men and 34,674 women aged 25-65 years. Prevalence of prehypertension in males was 59.6% and females and 44.5% in females.**(13)**

It is possible that high prevalence of Prehypertension among medical professionals may be due to high levels of stress as explained by Pickering that, Hypertension is often regarded as a disease of civilization, on the grounds that it is relatively uncommon in traditional village societies but becomes more prevalent when people

adopt urban lifestyles. Although it is generally conceived as an essential component of aging, an age related increase of blood pressure is by no means inevitable **(14)**

Our study is in partial agreement with that of **Shetty and Nayak (2012)** who conducted a study in 500 medical students in coastal Karnataka and found that prevalence of prehypertension was 55.4%. The study stresses the need to target this subgroup of prehypertensives more aggressively to prevent epidemic of hypertension and its sequel like coronary artery disease. It has been shown that overweight and increasing age are potential risks for future development of hypertension. Thus, control of weight and lifestyle modifications are potential factors in prevention of hypertension.**(15)**

A simulation model has shown that elimination of prehypertension results in a substantial public health benefit, thus providing the rationale for an interventional approach to this condition **(16)**.

Over the last decade, attention has been drawn to the diagnosis and treatment of disease during the preclinical stages, before the progression to overt clinical manifestations. The true question regarding prehypertension is not the mere method of its progression to overt hypertension but rather the global CVD risk associated with this condition and the potential risk reduction to be gained by early initiation of treatment **(17)**.

People with prehypertension have greater degrees of target-organ damage than do the normotensive individuals. Lifestyle modifications including weight loss, sodium restriction and dietary approaches should be recommended to and adopted by, all individuals with prehypertension **(18)**.

Recommendations

1 Monthly Blood Pressure checkup among the Medical Professionals should be made mandatory, so that Preventive measures can be taken.

2 Lifestyle modifications like salt restriction, weight loss and dietary changes are suggested in prehypertensive.

3 Stress relaxing modules like yoga, meditation should be practiced among all prehypertensive medical professionals.

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