ORIGINAL ARTICLE

Blood Pressure and its Determinants among 3rd and 4th Year Medical Students of a private medical college, Lahore

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ABSTRACT

Aims: To assess the status of Blood pressure and to find out the relationship of different risk factors with blood pressure, and to identify risk group for focused intervention to modify lifestyle by information, education and communication.
Study Design: Cross-Sectional analytic
Duration: From June 2014 to August 2014.
Setting: Study was conducted among MBBS students of 3rd & 4th year in Continental Medical College Lahore.
Methods: Data was collected from 100 students selected by systematic random sampling technique, 50 students from each class. Desired information was collected by administrating a questionnaire. Blood pressure was checked by BP and its determinants were analyzed by using SPSS. Statistical association was determined by chi-square test, P value $\leq$ 0.05 was considered significant.
Results indicated that out of 100 students of 3rd &4th year only 3% had high normal and 3% had stage 1 hypertension, of which 1 student was a known hypertensive and was taking medications regularly for it. The correlating factors as less physical activity , no sports ,long hours o f study, computer and internet searching while sitting and positive family history of obesity, hypertension and coronary heart disease in first blood relations. Students falling in high normal and even normal blood pressure showed positive association and these were concluding risk factors for their future health.
Conclusion: It was concluded that out of 100 students 6 had high blood pressure and all the risk factors like energy dense food, daily exercise, family histories of obesity, hypertension and CHD had positive associative value.
Keywords: Blood pressure trends, Determinants, Medical students

INTRODUCTION

Mortality from stroke has declined dramatically in developed countries throughout most of the past century[1] and more recently mortality from coronary heart disease has also decreased. Raised blood pressure is a major modifiable risk factor for both conditions[2]. These changes did not result from use of antihypertensive medications and point to the importance of factors in early life in determining blood pressure and risk of subsequent cardiovascular disease.

Since blood pressure in young adults is also positively associated with mortality from cardiovascular disease in later life[3], decrease in blood pressure in this age group could underlie declines in mortality from cardiovascular disease. Blood pressure tracks from childhood through to later life[4]. Examining trends in blood pressure in young adults, in whom blood pressure is largely uninfluenced by disease, medication or behavioural changes consequent on morbidity can help to elucidate the population determinants of blood pressure. However, few studies have investigated such trends[5].

B.P is physical pressure of blood in blood vessels. Normal B.P is 120/80 mm Hg. B.P is quite variable in different persons i.e., it changes with different normal daily life activities e.g., exercise, posture changes and stress work. B.P can be high or low. High blood pressure is also called hypertension. It depends upon various risk factors i.e., obesity, salt intake, fats intake, physical inactivity, sedentary life style, alcohol which are modifiable, but genetic factor[6] is considered as most important risk factor among non modifiable factors. Considered the “silent killer” high B.P affects approx one billion people worldwide, including one in three adults in United States (15th May, 2013)

High B.P also damages other organs like brain, kidney etc. It mostly happens in older people and people with family history. High B.P is found in about 20% of the community but in older age (more than 70 years old) ranges 40% to 50%.High B.P also damages other organs brain, kidney etc. It is mostly in older people and people with +family history[7].

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High B.P major complication lead to stroke, coronary Heart disease,IDH.[8] B.P can be measured simply by B.P apparatus(sphygmomanometer)and records both systolic and diastolic readings.[09] Treatment depends upon stage of hypertension of the person[10]. Main treatment is to avoid sedentary life style, physical activity, limit salt intake and lots of fiber intake[11].

Hypertension is a major public health problem of concern across the world because of its association with increased risk of cardiovascular diseases. (15 to 24 years) is an important period of growth and maturation and most of the changes that occur during this period are continued into adulthood[12].

Essential hypertension may have its origin in early life and its co-morbidities are certainly a major burden on resources, and they reduce the productivity of those affected with hypertension[13]. Prospective studies have established increased left ventricular mass and peripheral resistance, with high blood pressure in childhood[14]. Raised BP in childhood has been recognized as one of the most important predictors of adult hypertension[15] This has generated an interest among researchers to investigate the pattern of blood pressure and its determinants in adolescence[16].

Several studies have shown that the level and pattern of blood pressure among adolescents vary from population to population[17]. Life style, age and gender have strong influence on blood pressure[18]. It has been estimated that by 2010, 1.2 billion people have suffered from hypertension worldwide[19]. The prevalence of hypertension averages 26% and it affects approximately 125 million individuals in the Eastern Mediterranean Region. The United Arab Emirates (UAE) is in a period of transition. As late as the 1960s nomadic Bedouin Arabs were the population of UAE. UAE is a wealthy society, heavily influenced by Western living patterns, including a sedentary lifestyle with high Cardiovascular Diseases (CVD) risk profiles[20]. Indeed, CVDs are known to be the leading cause of morbidity and mortality in the UAE among both the nationals and expatriates[21].Of particular concern is the prevalence of obesity, which reaches approximately 24% among medical students[22] with reported high stress levels (65%), unhealthy diets (50%) and low levels of physical activity (77%) which is perhaps attributable to cultural and climatic restrictions[23]. Smoking has increased among people[24]. Hypertension is also common with a reported prevalence of 19-25%[25], 15.3% in urban and 10.6% rural population. The 15-24 years age is an important developmental stage in the life span of individuals as it is a transition period to adulthood.

Research methodology: Study settings and population was MBBS students of 3rd and 4th year in Continental Medical College Lahore. Sample size was estimated by an anticipated population proportion =0.50%, Confidence level 95%, Acceptable difference=0.1%. Calculated sample size was 97 but we took 100 students, fifty from each class. Sampling frame for students of 3rd and 4th year classes was obtained and 50 students from each class were selected by systematic random sampling technique i.e., every 2nd student. From randomly selected sample all willing and cooperative students were included in the study.

Data was collected by structured pre-tested questionnaire. The purpose of study was explained to the respondents and after having informed consent, students' Blood pressure of respondents was recorded and were interviewed by trained medical students who were carefully briefed about the technique of administration. The technique of face to face interview was used for socio-demographic data, student's life style with eating habits and intake of energy dense food, family history of high blood pressure, obesity, coronary heart disease and diabetes (Risk factors for high blood pressure) was asked by close ended questions.

Data was analyzed through SPSS. Age groups were made according to Year of birth and were divided into four bands; linear regression analysis was used to examine trends in blood pressure. Fully adjusted mean blood pressures and ±SD were calculated, controlled for the effects of smoking (yes/no), height(meters),BMI, father's social class. To assess blood pressure adjusted for this age was categorized as optimal (<120/80 mmHg), normal (120-129/80-84mmHg), high normal (130-139/85-89mmHg), hypertension stage I(140-159/90-99 mmHg), hypertension stage II (160-179/100-109mm Hg) or hypertension stage III (≥180/110mmHg). Chi-square test was used to see the association between high blood pressure in this age group and associated risk factors. P value of ≤0.05 was considered statistically significant.

Formal approval for the study was obtained from the Research Ethics Committee of CMC/Principal. Participation of students was voluntary and only those who gave their consent after explaining the purpose of study, their BP was recorded and were interviewed for all other information of 21.

RESULTS

Hundred medical students were enrolled for the study 50 male & 50 females, Minimum age among subjects was 20 and maximum was 24 yrs . Only 6% were of age 20 yrs, 69% were in group of 21- 22 yrs,15% of 23 yrs & 10% of >23 yrs. Ages were normally distributed with mean age of 20yrs, median of 22yrs and mode of 22yrs with a standard deviation of

±1.03 yrs. Mean weight was 65.28kg with a median of 65kg ,mode 60kg and standard deviation of ± 0.64kg. Height was normally distributed among respondents with mean of 1.65m and mode of 1.60 with a standard deviation of ±0.9m.Minimum height was 1.37m and maximum was 1.88m. Mean height was 1.73m among males and 1.63 m among females. Fifty six (56%) of respondents were between optimal range of blood pressure, 36% were normal, and 6 % were among high stage 1 hypertensive group.

Sixty (60%) students were hostlites while 40% were day scholars ,12% belonged to families having monthly income of Rs > 50,000 while rest 39% to families with monthly income of Rs 50,000 - 100,000 and 49% to families with monthly income of Rs 100,000 - 10,00,000.

Forty two (42%) of subjects were not or occasionally involved in some sort of out door and indoor sports activity while 58% had sports activity on regular basis and out of which 40.5% had daily activity 45.2% twice week and 14.3% had thrice week . Only 1% of the students said that they never take energy dense food (pizza ,burgers,biryani) , 56% said that they take 2-3 times /week , 34% on monthly basis and 9% daily. Thirty nine percent (39%) students said that they eat more during stress . Students who had daily studies of 8-9 hours were 7% , 10% had 6-7 hours, 12% for 5-6 hours 13% 4-5 hours while 53% studied only 2-4 hours daily . Twenty six (26%) students gave history of obesity in family. 32% of coronary heart disease and 62% had hypertension in the family . Out of 100 only 20 students were cigarette smokers and 4% were used to take drugs.

Occupation of respondent's parents depicted that most of them belong to upper middle class and 16% were Doctor's children , 9% were of engineers ,42% were belonging to Business class and 5% were bankers, 19% were agriculturists and 9% belonged to other occupations. Seventy (70%) mothers were housewives, 5% were doctors, 20% teachers, 2% were business women, 2% belonged to other occupations.

Out of 100, fifty six(56%) students were used to take energy dense food 2-3 times/week and it did show significant relationship with high blood pressure(p value= 0.000). Intake of daily snacks between meals had a significant relation with hypertension (p = 0.007).

No significant relationship was found between high blood pressure and no sports activity whether indoor or outdoor and any other physical activity as walking or jogging respectively
(p value= 0.11 and 0.06).

Table 1: Frequency distribution of students according to Body Mass Index (n=100)

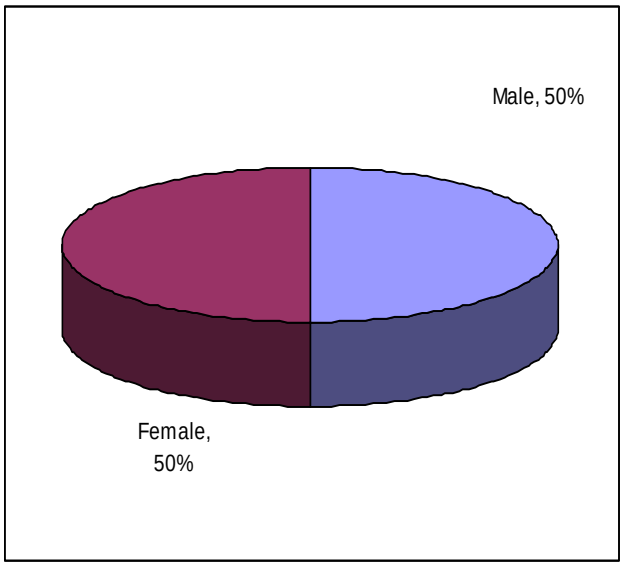
BMI	Frequency
underweight=<18.5	10
normal=18.5-24.5	43
overweight=25-29.9	33
obese=>30	14

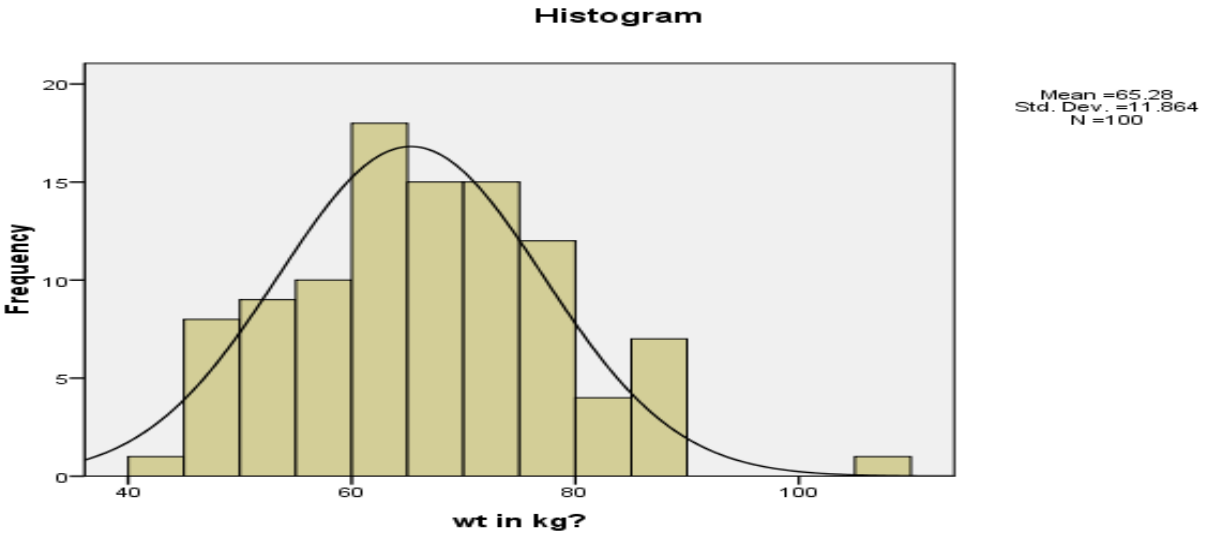
Table 2: Frequency distibution of students according to blood pressure (n=100)

Blood Pressure in mmHg	Frequency
Optimal to normal=<120-129/70-85	96
Stage 1 high= 130-139/86-89	03
Stage 2 high= 140-159/90-99	03

Positive family history of obesity (p value 0.000),hypertension(p value 0.012) and coronary heart disease (p value 0.00000) of the respondents also had highly significant relationship with high blood pressure.

Eating more during stress was also related to high blood pressure (p value 0.028) .Long study hours and other activities while sitting (7-8 hours/day) did show highly significant relationship with blood pressure(p value 0.000) .Total family income was also related to high BP(P value 0.000).and last but not the least smoking habit also had a significant relation with hypertension (p = 0.00001).





DISCUSSION

Blood pressure is a worldwide escalating problem caused by a complex interaction of genetic, socio-demographic, behavioural and environmental factors. Societal and behavioural changes over the last decades are held responsible for considerable increase in sedentary lifestyle as well as inappropiate dietary patterns including snacking, large portion sized meals, soft drinks, high fat and energy dense diet[26], which results in higher blood pressure and obesity.

Compared with similar and age standardized studies in western countries, the prevalence of hypertension found in this study population is considerably lower. This accounts for urban as well as for rural areas[27]. This difference can be partly explained by the relatively larger number of elderly people in the total adult population of the western countries. When we look at the prevalence of hypertension in different age groups in white Americans and suburban Dutch people and compare these data with ours, it is evident that the prevalence of hypertension is about the same in the younger age groups. However, in western societies elderly people are more likely to have hypertension. This may be due to less health care and higher mortality from non cardiovascular diseases which means survival of the fittest, thus eliminating potential hypertensive subjects among the elderly. When medical attention improves and life expectancy rises hypertension became probably become a more prominent problem. Our study, as well as many others, shows a difference in the increase in blood pressure with age between male and female students of age 20 to 24 yrs[28]. Salt intake, whose causal relationship with blood pressure levels is supported by results of experimental studies in south africa[29]

In our study among 100 students under study 56% were found within optimal range of blood pressure and only a total of 6% had a blood pressure between high normal and stage 1 hypertension.

Results of our study regarding relationship between blood pressure and high energy dense food intake was statistically significant to positive association (P=0.000).In our study about 26% students out of 100 had a positive family history of obesity (P=0.000),32% had positive family history of coronary heart disease (p=0.000),62% had positive family history of hypertension in first blood relations (p=0.012).In between snacks, large meals, family income etc showed significance with high blood pressure (0.000).

Besides income and education, racial group assignment may indirectly capture differences in household wealth, genetic ancestry, social stress (e.g. migration, discrimination) and dietary intake, possible confounders of the association between income and blood pressure were not otherwise captured in our analyses[30]. Economic development is associated with improving living standards and better health conditions leading to a decline in infectious diseases and the emergence of non communicable diseases. These processes are more rapid in affluent groups, and cardiovascular diseases and their risk factors such as obesity or hypertension may be associated with affluence in low-income countries.[31] This contrasts with the situation in high-income countries where cardiovascular diseases and their risk factors are more consistently associated with lower socioeconomic status. The studies reviewed by

Colhoun et al2 show that patterns of association of blood pressure and socioeconomic position are inconsistent in middle-income countries.

Eating more during stress (p= 0.028) and Residential status(p=0.046) both had positive significance.Daily exercise or 2 to 3 times/day sports activity showed significance of p=0.11

Smoking showed significance of p=0.000. Beyond differences in relative magnitude and statistical significance, the overall patterns of association of physical exercise, drug abuse, smoking and heart rate with blood pressure are consistent with those found in high income countries.

CONCLUSION

The results of the study indicated that out of 100 students of 3rd and 4th yr only 3 % had high normal and 3% had stage 1 hypertension out of which 1 student was a known hypertensive and was taking medications for it regularly, others didn't know they had hypertension, but the correlating factors as low physical activity, no sports activity, long hours of activities while sitting and positive family history of obesity, hypertension in first blood relations and coronary heart disease related to the students falling in high normal and even normal blood pressure, were concluding risk factors for their future health.

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