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Prevalence Of Hypertension And Obesity In Hyderabad.

H. MAHESAR, F. D. KHAND* AND G. M. SEEHAR

Department of Physiology, University of Sindh, Pakistan
Corresponding author: H. MAHESAR, email: hidayat-mahesar@yahoo.com Cell: No. 92-3453673419

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Abstract: The prevalence of hypertension and obesity in inhabitants of randomly selected six localities of Hyderabad city were studied by measuring blood pressure and body mass index of 3382 volunteers (2118 males and 1264 females, age range 20-76 years). With the help of a standard questionnaire, information about the monthly income of subjects was also gathered. The prevalence of hypertension in studied population was found to be 18% (16% in males and 22% in females). The prevalence of obesity, as determined on the basis of body mass index (BMI) and over weight was 0.44 % and 30% respectively. Hypertension varied in different income groups and the proportions were highest (67.7%) and lowest (4.43%) in groups having monthly incomes ≥ Rs 25000 and ≤ 10000 respectively. Similar to hypertension, highest and lowest values for body mass index (Mean ±SD) 24.64 ± 3.41kg/m^2 and 21.83 ± 3.05kg/ m^2 were seen in subjects having monthly incomes ≥Rs 25000 and ≤ 10000 respectively. Hypertension was far more prevalent in obese (65%) than in non –obese (6.3%) subjects. It was concluded from present study that the people with higher income were prone to obesity and in turn to hypertension.

Keywords: Hypertension, Obesity, Income, Overweight , Blood pressure.

1. INTRODUCTION

Screening for hypertension and obesity in the general population is a well-recognized beneficial public health practice. Proper diagnosis and treatment can prevent more serious health problems. According to Schroder *et al.,* (2002) and Puska *et al.,* (2003) more than 600 million people suffer from hypertension worldwide. The prevalence of hypertension reported for Saudi Arabia is 25% (Al-Nozha and Osman. 1998) for Iran 20.7% (Mohammadi *et al., 2002*), for Taiwan 24% (Philip 1998), for Canada 22% (Campbell 1999), for China 11.26% (Liu 1997). National Center for Health Statistics of United States (2001) reported that, in the United States of America 64% of men aged > 75 years can be classified as hypertensive.

Ben-Seferrn *et al.,* (2009) reported that those people who are undernourished in childhood and become obese in adulthood are more prone to develop chronic diseases like hypertension and obesity in more severe form than the children who are normal taking normal diet in their early life. Adolescent dieting, overweight and obesity are emerging public health problems in the western world. About ¼th of the Americans meets the definition of obesity as given by Geneva WHO Expert Committee in (1996). Obesity occurs when the number of calories consumed exceeds the number that is utilized, the reminder becomes stored as fat. The purpose of study was to determine the prevalence of hypertension and obesity in inhabitants of Hyderabad city.

2. MATERIALS AND METHODS.

Present study was conducted from December 1999 to June 2005, and included random screening of the inhabitants of the area for hypertension and obesity and determination of the associated risk factors. The targeted population belonged to different localities of Hyderabad city representing different ethnic, socio-economic and educational groups.

The study was initiated by data collection through a self-administered standard questionnaire on the pattern of Schroder (2001) and was specifically designed for face-to-face interview to obtain full information about the personal and family history, socioeconomic status and life style of the respondents.

A total of 4280 persons were approached out of which, 3786 showed their willingness to participate in the study. Amongst the participants 407 were excluded from the study, (374 because of non-compliance to respond to the questionnaire, and 33 were using drugs).

The remaining 3382 subjects (2118 males and 1264 females) age range 20-76 years, met study

*Department of Bio Chemistry ISRA University , Hyderabad Sindh , Pakistan

criteria. Those engaged in professions concerned with manual or physical labor or exercise /frequent walk (three or more kilometers daily) were considered physically active. After written consent had been obtained, all volunteers underwent the following procedures.

i) Blood pressure was recorded with Sphygmomanometer after five minutes rest (Geneva WHO Expert Committee 1996). Two measurements with 20 minutes interval were taken. All measurements were made by the same person. The value used was the arithmetic mean of both determinations, as described by Ministerio *et al* (1990). If the difference between two readings was more than 5 mm Hg, a third reading was taken. Volunteers were advised not to drink or smoke for 30 minutes during or before test, sit with back supported and feet flat, slightly bent their arms while keeping them at the same level as the heart.

The participant was classified as normotensive whose systolic blood pressure (SBP) was≤140 mm Hg and diastolic blood pressure (DBP) ≤90 mmHg.

ii) Mean arterial pressure (MAP) was calculated as DBP+1/3 of PPiiiv) Body mass index (BMI) was calculated according to Al-kandari (2006) as the weight in kilograms divided by height squared in meters i.e, Kg/m^2.

As an indicator of obesity subjects were classified into three categories according to WHO criteria for overweight and obesity is Asians as acceptable weight (BMI < 23 kg/ m^2), overweight (≥23 k/g m^2), and obesity (≥ 25 kg/ m^2).

3. STATISTICAL ANALYSIS OF THE RESULTS.

Data was analyzed and expressed as %, mean ± standard deviation of the mean. Two tailed Pearson correlation was used for the determination of relationship of different variants with blood pressure and obesity. In all cases, statistical significance was accepted when two-sided p values were lower than 0.05. SPSS 11.0 version for computer Windows was used for processing and analyzing all data.

4. RESULTS

(Table-1) **S**hows that the BMI of normotensive and hypertensive volunteers was (mean ±SD) 21.9 ± 2.6 Kg/m^2 and 25.7 ± 2.7 Kg/m^2 respectively.

BMI of the oil consumers and ghee consumers was 23.44 ± 2.91/m^2 and 22.11 ± 3.04/m^2 respectively. BMI was positively associated with income.

Prevalence of hypertension and obesity was 18.5% and 0.44% respectively. Hypertensive subjects 35.3%, 2.0%, 77.5% and 72.1% were respectively smokers, obese, overweight and with sedentary life style. The data revealed that, the frequency of hypertension in obese subjects was (86.7%). Individuals with an income of rupees >25000/month were at higher risk of hypertension than those having income Rs ≤10000/month. It was also noted that 70 % hypertensive, 86.6% obese and 69.8% overweight volunteers were from higher income group.

Prevalence of obesity and overweight in normotensive volunteers was 0.07% and 20.72% respectively, as against 2.08% and 77.56% respectively in hypertensives. Females as against males were 0.71% vs 0.28% obese and 13.51% vs 17.23% overweight.

Prevalence of obesity was highest in age range70≤ years and lowest in 30-39 years. Prevalence of hypertension was highest in age range 50-59 years. Present results indicate that age had significant (P< 0.01) correlation with blood pressure. BMI had significant (P< 0.01) correlation with blood pressure, income, and physical activity. SBP and DBP had significant (P< 0.01) correlation with income, and physical activity.

Table 1. Relationship of socio-demographic factors with blood pressure and body mass index

N= total number of samples, SBP=Systolic blood pressure, DBP= diastolic blood pressure, PP= pulse pressure,

Variable	Frequency of variable N	%	SBP mmHg Mean ± S.D	DBP mmHg Mean ± S.D	MAP mmHg Mean ± S.D	BMI Kg/m² Mean ± S.D
Normotensives	**2758**	**81.5**	121.8±58.58	81.4±6.34	94.8±6.88	21.9±2.66
Hypertensives	624	18.5	153.8±9.0	102.6±5.28	119.6±5.88	25.7±2.72
Females	1264	37.3	127.7±17.20	84.9±11.01	99.2±12.88	22.6±3.53
Males	2118	62.6	128.6±14.47	85.8±9.81	100.1±11.05	22.7±2.73
Smokers	933	27.5	130.1±16.33	87.2±11.28	101.5±12.80	22.6±3.07
Non smokers	2449	72.4	127.6±15.19	84.8±9.80	99.1±11.29	22.7±3.05
Obese/ O.W	697	20.6	144.69±14.98	96.40±8.86	112.49±10.62	26.78±0.96
Normal/ U.W	2685	79.4	124.09±12.61	82.68±8.61	96.47±9.62	21.65±2.47
Oil consumers	1509	44.6	132.7±16.36	88.8±10.69	103.4±12.41	23.4±2.91
Ghee consumers	1873	55.3	124.7±13.88	82.8±9.11	96.8±10.33	22.1±3.04
Physicallyactive	1796	53.1	124.6±12.99	83.4±9.19	97.1±10.30	22.3±3.02
Sedentary	1586	46.9	132.4±17.10	85.5±10.28	99.7±11.78	22.7±3.05

MAP= mean arterial pressure, BMI= body mass index, mmHg= milli meters of mercury, SD= standard deviation.
O.W = Over weight U. W= Under weight

Table 2. Relationship of monthly income with blood pressure and body mass index (N=3382)

Variable	SBP mmHg	DBP mmHg	PP mmHg	MAP mmHg	BMI Kg/m²
Income (Rs/month)	**Mean ± S.D**	**Mean ± S.D**	**Mean ± S.D**	**Mean ± S.D**	**Mean ± S.D**
≤10000	124.5±14.29	82.4±9.64	42.0±7.66	96.4±10.82	21.83±3.05
10001- 15000	126.9±11.98	85.8±7.69	41.0±5.79	99.5±8.93	23.37±2.39
15001- 20000	129.3±14.55	85.8±8.95	43.4±6.81	100.3±10.66	23.12±2.79
20001- 25000	144.6±16.92	90.2±10.49	44.3±7.40	105.0±12.51	23.66±2.70
>25000	144.7±16.71	96.1±10.93	47.5±8.08	112.0±12.57	24.64±3.41

Table 3. Relationship of socio-demographic factors with hypertension, obesity and overweight

Variable	Frequency of variable n =3382	Frequency of Hypertension n =624	Frequency of Obesity n =15	Frequency of Overweight N=1040
Males	2118	351	06	583
Females	1264	273	09	457
Smokers	933	220	04	294
Non smokers	2449	404	11	746
Normotensives	2758	----	02	556
Hypertensives	624	----	13	484
Obese	15	13	----	----
Overweight	1040	484	----	-
Normal/ underweight	2327	127	----	----
Active	1796	174	03	447
Sedative	1586	450	12	593
Oil consumers	1509	438	12	612
Ghee consumers	1873	186		
Income ≤Rs 10000/m	1670	187		
Income >Rs 10000/m	1712	437	13	726

Table 4. Relationship of age with obesity, overweight and hypertension. (N=3382)

Age (Years)	Variable Frequency	Obese n	Overweight n	Hypertension n
20-29	1710	1	272	46
30-39	339	0	126	29
40-49	431	5	189	132
50-59	394	3	246	195
60-69	436	5	204	190
≥70	72	1	3	32

Table 5. Correlation Co-efficient of blood pressure with socio-demographic factors.

Variable	SBP	DBP	MAP	BMI
SBP	--------	--------	--------	
DBP	--------	--------	--------	
MAP	--------	--------	--------	
Age	0.599**	0.608**	0.521**	0.274**
Sex	-0.028	-0.044*	-0.130	0.002
Smoking	-0.072**	-0.103**	-0.312**	0.015
Income	0.363**	0.383**	0.133	0.273**
BMI	0.511**	0.550**	0.572**	--------
Physical Activity	0.127**	0.250**	0.605**	0.127**

** Correlation is significant at p<0.01
* Correlation is significant at p<0.05

5. DISCUSSION

Present findings showed that, BMI was slightly higher than reported by Bender (2009). Results of present study depict that, the prevalence of hypertension was 18.4% in Hyderabad. Observed rate in present study is higher than reported by Khan *et al*., (1993) from Multan, Pakistan, lower than the report of a Geneva WHO Expert Committee (1996). A survey report from northern Taiwan (1997) stated that, approximately 20% of the population was affected in most developed countries. However Cielito *et al.,* (2000) reported 23% hypertension rate in a rural area of the Philippine. It may differ among different parts of a country depending on the region of the country and the population subgroup, for example, hypertension, prevalence in Brazil ranges from 5% to 40%, (Yunis and Krob 1998). Prevalence of hypertension in males was observed (16%), lower than females (21%). However, more males than females were aware of their raised blood pressure, but most of the hypertensive volunteers did not undergo drug therapy. Gender wise findings of present study regarding prevalence of hypertension were in contradiction with the a survey report by Sixth national committee of northern Taiwan (1997) according to this report 27.2 % males and 13.6 % females were hypertensive. Similarly from Philippine Cielito. (2000) also reported prevalence of hypertension in males (24%) and in females (22.64%). It is reported by Feinman *et al.,* (2003) that, in females, arterial pressure generally increases after menopause.

Present results depict that 86.6% obese were hypertensive where as non obese respondents were 5.4% hypertensive. It demonstrates the appositive ssociation of obesity and hypertension. The reason might be their high caloric dietary intake.

Findings of present study show that 0.44% of total volunteers were obese and 30.75 % overweight. Normotensives were less obese (0.07%) than hypertensive volunteers (2.08%), these findings are in consistence with the findings from a cross-sectional population survey conducted in Finland documented by Kastarinen, *et al.,* (2000), suggesting that more than 85% of hypertension occurs in subjects with a body mass index (BMI) > 25 kg/ m^2. In the results of a study by Xavier. Pi- Sunver *et al.,* (1998) Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, stated that among hypertensive patients, about 70% were overweight and among obese 72% had hypertension. It indicates that, in present study, over all prevalence of obesity was lower than from Europe. Similar associations of weight and blood pressure are reported from Multan by Taswar *et al*., (2001), and Khan *et al.,* (2003). Findings of present study showed that females were more prone to obesity (0.71%) than males (0.28). Similarly females were 17.2% overweight and males were13.5%. Present rate was near to the earlier findings of Musaiger *et al*., (1993) from Bahrain, they have reported that, 17.4% of girls were either overweight or obese (BMI > 25kg/m^2) in Bahrain.

Present results revealed that amongst the obese volunteers 87% belonged to monthly income ≥Rs10000. Amongst the volunteers with income <10000, 0.12% were obese and 43.3% overweight. Similarly the prevalence of hypertension in volunteers with income < Rs 10000/m was lower (11.2%) than in respondents with higher income (25.53%). It demonstrates that prevalence of hypertension was positively associated with income. Present results agree with the findings reported by Cielito and Reyes (2000) that prevalence of hypertension in volunteers with lower monthly income(≤$ 63) was 20.47% and in volunteers with higher income (≥$ 63) it was 25.90%. The higher value of blood pressure (BP) in higher income group was observed in association with high living status and high caloric dietary habits and less physical activity than that of low income group. Results of present study revealed that prevalence of

hypertension in oil consumers was higher (29%) than in ghee consumers (9.3%) and blood pressure level in oil consumers was found to be higher (132/88 mmHg) than ghee consumers (124/82 mmHg) and body mass index in oil consumers was also higher (23.44±2.91kg/m^2) than ghee consumers (22.11±3.04kg/m^2). Volunteers with lower income were 10.5% oil consumers, whereas, 80.6% of volunteers with lower income were ghee consumers. From results of present study therefore it could be concluded that oil is consumed frequently by higher income subjects so; social status might be the reason for the higher rate of hypertension in oil consumers. The income and body mass index had significant correlation with blood pressure at (P>0.01) level. Findings of present study agree with the reports of Cielito and Reyes (2000) that, respondents with body mass index ≥ 25kg/m^2 had more than double the risk for hypertension suggesting the need for behavior modification programs pertaining to weight control.

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