

Original Article

Prevalence and Factors Associated with Obesity and Treatment of Blood Pressure among Kuwaiti Hypertensive Patients in a Primary Health Care Clinic

Nadia Yousef Al-Mahmoud

Ehqaqi Primary Health Care Clinic (Daiya Clinic), Kuwait

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ABSTRACT

Objectives: To determine the prevalence of obesity among adult hypertensive patients and to investigate associated factors and the differences in drug doses at the Daiya primary care clinic in Kuwait

Design: Cross-sectional study

Method: Two hundred hypertensive Kuwaiti patients on antihypertensive medication and attending the Daiya clinic during a period of six months between January and June 2004 were included in the study.

Results: A high prevalence of obesity (68%) was seen

among hypertensive patients. The multiple logistic regression analysis showed that the significant associated factors were non-compliance with diet ($p = 0.006$) and age (< 65 , $p = 0.002$). Factors such as intake of evening snacks and family history of obesity were not found to be significantly associated. Obese patients needed more than one drug to control their blood pressure.

Conclusion: There is a high prevalence of obesity among hypertensive patients. Hence, intensive programs are recommended to control their obesity.

KEYWORDS: body mass index, hypertension, obesity, primary care

INTRODUCTION

Obesity, according to WHO, is defined as Body Mass Index (BMI = weight in kilograms divided by height in meters squared) 30 kg/m^2 and overweight as BMI 25 kg/m^2 ^[1]. Obesity, characterized by storage of additional body fat, develops when energy intake exceeds energy expenditure^[2]. Epidemiological studies show that about 55% of US adult population is overweight and 22% is obese. In the last two decades obesity has increased by more than 30% in USA^[1]. The prevalence of obesity in Kuwait has increased by 15.4% between 1980-81 and 1993-94 among Kuwaiti men due to modernization, affluence and concomitant changes like sedentary life style^[3]. Prevalence of overweight and obesity also increased among both gender in Kuwait between 1980 - 81 and 1993 - 94. The rate of temporal changes in BMI and obesity were higher by comparison in Kuwait than in selected other countries^[4,5].

Obesity, especially upper body fat distribution is an independent risk factor for the development of hypertension^[6-9]. Hypertension is defined as blood pressure $140/90 \text{ mmHg}$ with or without antihypertensive medication^[10]. Recent studies showed that both systolic and diastolic blood pressure increases in a linear manner over the

whole range of BMI or waist circumference^[11-12].

Obesity being one of the risk factors and determinant of poor BP control, it was thought necessary to study the factors associated with obesity among hypertensive patients. Weight reduction is one of the most effective non-pharmacological approach to BP control^[7].

Hypothesis

Majority of hypertensive patients are obese. Factors associated with obesity are lack of exercise and poor diet compliance. More number of drugs are needed to control BP among obese patients.

METHODOLOGY

A cross-sectional study was undertaken at the Daiya (Al - Ehqaqi) primary care clinic in Kuwait during a period of six months between January and June 2004. The study included 200 consecutive Kuwaiti hypertensive patients who attended the Daiya primary health care clinic for monthly follow-up. They were among 300 patients registered in the clinic. Non Kuwaitis were excluded.

A structured questionnaire was either self-administered or assisted by the author in illiterate patients. The questionnaire included the characteristics of the patients (e.g., age, gender, onset of hypertension,

Address correspondence to:

Dr. Nadia Yousef Al-Mahmoud, Head, Ehqaqi Primary Health Care Clinic (Daiya Clinic), Shamiya, P.O. Box 12364, Kuwait 71654. Tel & Fax: 433 5653

Table 1: Comparison of associated factors with levels of body mass index (BMI, kg/m²)

Factors	BMI < 30 (n=63)		BMI ≥ 30 (n=135)		p- (*) value
	n	(%)	n	(%)	
Exercise					0.348
Does exercise	19	(30.2)	32	(23.9)	
No exercise	44	(69.8)	102	(76.1)	
Snacks in the morning					0.281
Eats	24	(38.1)	62	(46.3)	
Does not eat	39	(61.9)	72	(53.7)	
Snacks in the evening					0.002
Eats	12	(19.0)	56	(41.5)	
Does not eat	51	(81.0)	79	(58.5)	
Diet compliance					<0.001
Is compliant	41	(56.1)	52	(38.5)	
Not compliant	22	(34.9)	83	(61.5)	
Family history of obesity					0.017
Had family history	9	(14.3)	40	(30.1)	
No family history	54	(58.7)	93	(69.9)	
Age					<0.001
< 65	31	(49.2)	102	(75.6)	
≥ 65	32	(50.8)	33	(24.4)	
Mean age ± 13.2 yrs			58.2		
Mean age at onset of hypertension ± 13.0 yrs			50.9		

*p-values were generated using chi - square test, student's and t-test to compare means.

treatment, diet compliance, exercise and family history of obesity). BP was measured using a mercury sphygmomanometer and recorded in the file (taking the last three readings in file on three separate visits at least one month apart). Thereafter, patients' weight and height were taken by the author, used physician Balance BEAM Scale and BMI was calculated.

The data was entered and analyzed in SPSS (Statistical Package for Social Sciences). Chi-square test was used for the categorical variables and p-value < 0.05 was considered as significant. Factors associated with obesity among hypertensive patients were identified using logistic regression multivariate analysis.

RESULTS

The mean age of patients in the study group was 58.16 ± 13.2 years, mean age at onset of hypertension 51 ± 13.0 years and mean BMI was 32.44 ± 5.50 kg/m². It was also found that the BP was controlled in 77% patients.

The patients were classified into two groups based on their BMI. Those with a BMI ≥ 30 were considered obese while those with a BMI < 30 were non - obese. According to this classification, the prevalence of obesity among hypertensive patients in this sample was 68%.

There was no apparent difference in gender among the low BMI patients, but among the high BMI, there seemed to be more females (75%) than

Table 2: Factors associated with obesity among hypertensive patients as identified by the logistic regression analysis

Variable	Adjusted odds ratio	95% C I	p-value
Evening snack			
No (control)			
Yes	2.115	0.98 - 4.566	0.056
Diet compliance			
Yes (control)			
No	2.581	1.316 - 5.065	0.006
Family history of obesity			
No (control)			
Yes	1.678	0.712 - 3.953	0.236
Age (in years)			
< 65			
≥ 65	2.922	1.48 - 5.767	0.002

Dependent variable (BMI < 30 kg/m² = 0, BMI ≥ 30 kg/m² = 1)
95% CI = 95% confidence interval for adjusted odds ratio

males (60%). Table 1 describes comparison of associated factors with level of BMI. It was observed that eating snacks in the evening was significantly associated with obesity (41% obese versus 19% non-obese). Non-compliance to a proper prescribed diet showed that 61.5% were obese compared to 34.9% non-obese. Patients in the age group < 65 years were significantly associated with obesity (75.6%). Doing exercise and eating morning snacks had no significant association with obesity in this study

A multivariate analysis was done to see the combined effect of the significant factors on obesity. Table 2 describes factors associated with obesity among hypertensive patients as identified by the logistic regression analysis. This shows that non - compliance to prescribed diet (p = 0.006) and age < 65 years (p = 0.002) were significant.

A significant association was found between doing exercise and blood pressure control regardless of obesity. Amongst those who did exercise, 88.2% had their BP controlled whereas in those not exercising, only 74% had their BP controlled.

Among the non- obese, about 73% patients could manage to control their BP with only one drug as opposed to about 52% in the obese group which was statistically significant.

DISCUSSION

The prevalence of obesity among hypertensive patients was 68% in our study group. This indicates that obesity is a major risk factor for the development of hypertension as indicated by previous studies^[1,6,9-13]. As obesity is independently associated with hypertension, there is a strong need to address the problem among hypertensive patients. A previous study in Kuwait reported women more obese than men^[14]. This was also observed in our study.

As seen in this study, compliance to prescribed diet and not eating snacks in the evening had a significant direct association with non-obesity. This should be considered as a significant non-pharmacological measure to control blood pressure [7,9-10].

The current study showed that significant proportion of obese people needed two or more drugs to control their blood pressure which again calls for losing weight as an important measure. As mentioned in some other studies, weight loss can help decrease the number and dosage of drugs which can reduce side-effects and treatment costs [7,9,12,14].

In the multivariate analysis, it was found that age factor is a strong predictor of obesity and this is high among the middle age group. The mean age of onset of hypertension in the study group was 51 years. Therefore, it can be suggested that more attention should be given to this age group by the GPs as regards their health education about obesity related hypertension [9,12,15,16].

Exercise was found to play a significant role in the control of BP. Therefore, reinforcing the need to exercise is a very important part of hypertension management [9,10,17-19].

The current study thus reinforces the obvious fact that obesity is one of the prime predisposing factors for hypertension and that all necessary measures to control obesity will facilitate any treatment for this condition.

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REFERENCES

- Atkinson RL. A 33- year old women with morbid obesity. *JAMA*2000; 283:90-94.
- Hamann A, Sharma AM. Genetics in obesity and obesity related hypertension. *Seminars in Nephrology* 2002; 22:100-104.
- Al-Isa AN. Temporal changes in body mass index and prevalence of obesity among Kuwaiti men. *Annals of Nutritional Metabolism* 1997; 41:307-749.
- Al-Isa AN. Body mass index and prevalence of obesity among Kuwaitis. *European Journal of Clinical Nutrition* 1997; 51:743-749.
- Al-Isa AN. Changes in body mass index and prevalence of obesity among Kuwaitis 1980-1994. *International Journal of obesity* 1997; 21:1093-1099.
- Rocchini AB. Obesity hypertension. *American Journal of Hypertension* 2002; 15:505-525.
- Zhang R, Thakur V, Morse S, Reisin E. Renal and cardiovascular considerations for the non-pharmacological and pharmacological therapies of obesity - hypertension. *Journal of Human Hypertension* 2002; 16:819-827.
- Bell AC, Adair LS, Popkin BM. Ethnic differences in the association between body mass index and hypertension. *American Journal of Epidemiology* 2002; 155:346-353.
- Al-Turki AY. The prevalence of overweight and obesity amongst hypertensive and diabetic adult patients in primary health care. *Saudi Medical Journal* 2000; 21:340-343.
- MacKnight JM. Exercise consideration in hypertension, obesity and dyslipidemia. *Clinical Sports Medicine* 2003; 22:101-121.
- Engeli S, Sharma AM. Emerging concepts in the pathophysiology and treatment of obesity-associated hypertension. *Current opinion in Cardiology* 2002; 17:355-359.
- Leiter LA, Abbot D, Campbell RC, Mendelson R, Ogilvie RI, Chockalingam A. Recommendations on obesity and weight loss. *Can Med Assoc J* 1999; 1600:S7-S11.
- Hall JE. The kidney, hypertension, and obesity. *Hypertension* 2003; 41:625-633.
- Saito I, Murata k, Hirose H, Tsujika M and Kawabe H. Relation between blood pressure control, body mass index and intensity of medical treatment. *Hypertension Research* 2003; 26:711-715.
- Al-Isa AN. Prevalence of obesity among adult Kuwaitis: a cross-sectional study. *Internat J Obes* 1995; 19:431-433.
- Al-Isa AN. Changes in body mass index and prevalence of obesity among adult Kuwaiti women attending health clinics. *Ann Saudi Med* 1997;17:307-311.
- Campbell RC, Burgess E, Taylor G, *et al.* Lifestyle changes to prevent and control hypertension: Do they work? *Can Med Assoc J* 1999; 160:1341-1343
- Cleroux J, Feldman RD, Petrella RJ. Recommendations on physical exercise training. *Can Med Assoc J* 1999; 160: s21-s27.
- Davy KP, Hall JE. Obesity and hypertension: two epidemics or one? *Am J Physiol Regul Integr Comp Physiol* 2004; 286: R 803- R 813.