A study of Association between Overweight and Obesity with Hypertension at Al Zahra Hospital in Kut City

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ABSTRACT

Background and aims: Hypertension is a chronic non-communicable disease. It has long been recognized as a contributing to a variety of adverse health consequences. The major factors responsible for hypertension are obesity where epidemiologic studies have revealed the correlation between body weight and the risk of hypertension. The study aims to identify any association between overweight and obesity with hypertension . In addition, to determine the association it with demographic characteristics of the study population

Materials and methods: A case control study design has been adopted upon 224 subjects (112 cases and 112 controls) attending Al Zahra hospital in Kut city during the period from 1st of July 2016 to end of September 2016. Required data were obtained by direct interview with hypertensive patients and normotensive subjects. Statistical analysis was done by using Minitab version 18.0.

Results: the percent of obesity was 37.50 % and overweight was 46.43% among cases. There was statistically significant association between obesity and hypertension ($p<0.05$). No statistical association of hypertension with demographic characteristics ($p>0.05$).

Conclusions: Hypertension tends to affect age groups between 45-75 years and prevalence in female is more than in males, also it is more prevalent in urban areas than among rural areas. A statistically significant association was proved for obesity and hypertension.

Recommendations: Encourage patients to change their lifestyle through decreasing their weight, adapting physical activity and following healthy eating habits. Activating the role of media in raising awareness about the problems of hypertension and obesity.

Keywords: BMI, Hypertension, Obesity.

INTRODUCTION

Hypertension is a chronic non-communicable disease (Rukevwe *et. al*,2015). It has long been recognized as a contributing to a variety of adverse health consequences (Brandão *et. al*, 2017) which has become the leading cause of mortality and morbidity (Theodore, 2010) thus adversely affect the quality and length of life (Lawal *et. al*, 2014). As reported by WHO, hypertension was the third leading cause of death in the world (Khatib and Sayed, 2005). The results of the national survey conducted in 2006 showed that the overall prevalence of hypertension in Iraq was 41.5 per 1000 (MOH, MPA and WHO, 2007). In the context, the annual report of the Iraqi Ministry of Health has revealed that hypertension among patients attended to different Iraqi hospitals in 2011 was 39.6% (MOH, 2013). The major factors responsible for hypertension are obese (U Odili *et. al*, 2014) where epidemiologic studies have revealed the correlation between body weight and the risk of hypertension (Kingue *et. al*, 2010). The worldwide increased incidence of hypertension is attributed to increased obesity (S S. Shradha *et. al*, 2015). Obesity is an increasing problem and has become a global disease that (Danasekaran and Vinoth, 2015) had dramatically increased in the last decade only (Zoë, 2007), it called new world syndrome(Aroraand Patel, 2007). It is currently estimated that the global prevalence is over 1.5 billion people(Kalani *et. al*, 2015). Dietary behaviors are another factor to play role in the hypertension. Low physical activity is another factor in hypertension in adults (Khaled *et. al* , 2014). In addition, smoking, high alcohol intake and sodium intake are contributory factors for hypertension (Sara *et. al*, 2008). From what have mentioned previously and to highlight the most important cause of hypertension disease, the study aimed to identify the association between overweight and obesity with hypertension. In addition, to determine the association with other variables among the study population.

MATERIALS AND METHOD

A hospital-based case-control study design was used to determine the association between overweight and obesity with hypertension. Cases were involved in the study period between March 2016 to September 2016. Further, controls were involved during the same

period. The study was conducted in Al Zahra hospital in Kut city. The population in this study included patients attending Al Zahra hospital in Kut city. The case definition included all patients from Al Zahra hospital in Kut city, who have hypertension (diagnosed by physician). The control group definition included all patients from Al Zahra hospital in Kut city, who don't have hypertension (normotensive). Researcher identified 121 eligible cases (49 male, 72 female) aged between 45 and 75 years and from both genders, resident of Wassit Governorate and who have hypertension. Only nine of these refused to participate, therefore, they were excluded from the study. Finally number of the cases was 112 with respondens 93% and the same number of controls who don't have hypertension and resident of Wassit Governorate (n=112) were chosen from the same hospitals. Controls were matched with cases according to age and gender . Data were collected, by direct interviewing of every patient, by using questionnaire form that included the following domains: socio demographic characteristics (age, gender, place of residence, Occupation), anthropometric measures : weight (measured with participants wearing light clothing without shoes, weight was measured in kilograms), height was measured with shoes removed , in cm using tape measure, body mass index (BMI) was calculated using to the formula: BMI = weight (kg)/ height (m^2). Patients were classified into subgroups according to their BMI [Normal weight (18.5-<25), over weight (25.00-29-99) , and obese (≥30.00)](Ali, 2011). The data analyses were conducted with the use of Minitab 18.0 . Means and proportion for clinical parameters were calculated. Data were analyzed using descriptive statistical methods. The Chi-square tests were used to evaluate the associations between hypertension and obesity. Pearson correlation was calculated for the correlation between two quantitative variables In the present study, statistical significance was set at $P<0.05$.
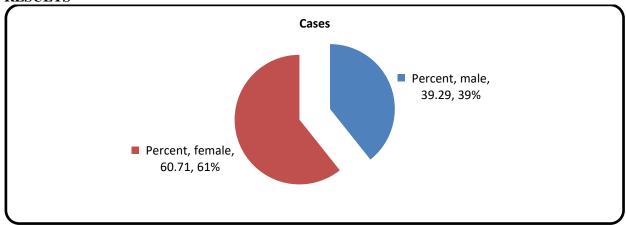
RESULTS

Figure (1) Distribution of the studied population according to the gender

Table (1) Distribution of the studied sample according to the age groups (years) for both genders, and the mean (±SD) values of data.

Age (years)	Cases N=112						Controls N=112					
	Males		Females		Total		Males		Females		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
45 - 55	15	34.09	32	47.06	47	41.96	15	34.09	34	50.00	49	43.75
56 - 65	22	50.00	22	32.35	44	39.29	22	50.00	22	32.35	44	39.29
66 - 75	7	15.91	14	20.59	21	18.75	7	15.91	12	17.65	19	16.96
Mean±SD (Range)	58.161± 7.434 (45-75)						58.571± 7.798 (45-75)					

Table(2)Distribution of the studied sample according to Demographic Characteristics.

Demographic characteristics	Cases N=112		Controls N=112		OR	95%CI	P-value
Education level	No.	%	No.	%			
Illiterate	46	41.07	46	41.07	-	-	
Read and write	8	7.14	6	5.36	1.33*	0.428-4.146	
primary school	16	14.29	24	21.43	0.66*	0.313-1.415	
intermediate school	18	16.07	12	10.71	0.75*	0.359-1.5644	0.572
secondary school	12	10.71	9	8.04	1.33*	0.512-3.0468	
Institute, university	12	10.71	15	13.39	0.8*	0.337-1.896	
pearson correlation= -0.002			χ^2= 3.848				DF=5
Employment status							
Unemployed	10	8.93	7	6.25	-	-	
Retired	23	20.54	25	22.32	0.644**	0.210-1.973	
Government employed	15	13.39	14	12.50	0.75**	0.223-2.514	0.954
Private	6	5.36	6	5.36	0.7**	0.158-3.099	
Housewife	58	51.79	60	53.57	0.676**	0.241-1.867	
pearson correlation= 0.024			χ^2= 0.681				DF=4
Residence							
Urban	111	99.11	108	96.43	0.243	0.026-2.211	0.175
Rural	1	0.89	4	3.57			
pearson correlation= 0.091			χ^2= 1.841				DF=1

* As compared with Illiterate.
** As compared with Unemployed

Table (3): Distribution of the studied sample according to obesity parameters.

BMI	Hypertensive (Cases)		Normotensive (Controls)		OR	95%CI	P-value
	No.	%	No.	%			
Normal weight	18	16.07	60	53.57	6.190*	3.077-12.453	
Over weight	52	46.43	28	25.00	5.833*	2.818-12.0721	0.000
obese	42	37.50	24	21.43			
pearson correlation= -0.335			χ^2= 34.724			DF=2	

* As compared with normal weight.

DISCUSSION

In this study, The majority (61%) of cases were females while males were 39% . (figure 1). This table represents the distribution of patients for both genders according to three age groups. The highest frequencies fell in the (45 – 55 years) of cases was 41.96% (34.9% males, 47.6% female) and controls was 43.75% (34.09% males, 50.00 female), then followed by the (56 – 65 years) age group (39.29%) for cases and controls. The mean and standard deviation (SD) age of cases was 58.161± 7.434 , range: 45-75 years.

The study shows that the higher percentage of cases 41.07% were illiterate while the lower percentage 7.14% were in read and write education level, and the higher percentage of controls 41.07% were in illiterate while the lower percentage 5.36% were in read and write education level, the difference between cases and controls with respect to education level was statistically not significant (*P*-value =0.572). The higher percentage of cases 51.79% was among housewives and the lower percentage was 5.36% among private with no significant association *P*-value=0.954. This table reveals

that 99.11% of cases and 96.43% of controls were residing in an urban area with no significant result *P*-value =0.175.Table (2).

Table (2), shows the frequency and percentage of clinical data (obese, overweight, normal-BMI) for cases and controls. When assessing studied sample state in regard to obesity, study results revealed that 37.50% of cases and 21.43% of controls are having a BMI > 30. While 16.07% of cases and 53.57% of controls have normal weight (BMI < 25). In addition, 46.43% of cases and 25.00% of controls found having over weight with significant finding (*P*-value =0.000).

The mean age of the present study population is 58.161± 7.43 years. and 58.571±7.798 years respectively. This is similar to the mean age of Conen *et. al*, in USA study during (2009), which was 54+7 years. A non significant difference was found between the numbers of patients in the three age groups when we compared them with that of control (*P*-value > 0.05). This result is contrary to the findings of previously conducted study done by Mussa *et. al*. The present study showed that residence was negatively associated with hypertension, on the other hand, majority of study subjects were urban residents. Such result goes with the findings of study done by Amandi (2012) in South Africa which found that the prevalence of hypertension is not significantly in urban than rural subjects.

Regarding educational status, forty one of cases were illiterate. The association between hypertension and education was not significant. The findings of a study by Fikadu *et. al*, 2016 in Ethiopia shows that there was negative association between hypertension and educational status. In regard to employment status, a non significant difference was found between the cases when they were compared with that of control responding (*P*-value > 0.05). These results match with Fikadu *et. al*, 2016 in Ethiopia who had stated that the association between hypertension and employment status was not significant. The present study revealed that 37.50% of cases have BMI ≥30 and 46.43% of cases have overweight against 21.43% and 25% of controls. Such high rates of overweight and obesity among hypertensive patients go with the finding of Mussa study which demonstrated that, 60% of hypertensive patients were obese. Also the current study shows that there was a significant correlation between hypertension and obesity (r = 0.23, *P* <0.000). Similar finding was documented by

Mohamed *et. al*. It is well known that obesity plays an important role in the development of hypertension. It has been found that weight has a positive impact on hypertension.

CONCLUSION

Hypertension tends to affect age groups between 45-75 years and prevalence in female is more than in male. It also is more prevalent in urban areas than among rural areas. A statistically significant association was proved for obesity and hypertension.

RECOMMENDATIONS

Obesity as assessed by BMI is associated with hypertension. Thus approaches to reduce the risk of developing hypertension may include prevention of overweight and obesity, including Encourage patient to change life style through decreasing body weight, adopting physical activity and healthy eating habits. It also recommends activating the role of the media in raising awareness about the problems of hypertension and obesity. Further researches are suggested for early identification of other of hypertension risk factors.

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