

Original Research Article

Risk Factors of Hypertension Among Apparently Healthy Workers in Al-Hilla Textile Establishment

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Abstract

Hypertension is an increasing public health problem in developing countries including Iraq, the consequences of this chronic disease are very serious , the pathogenesis of essential hypertension is still not explained .

The objectives of this study were to assess the prevalence of hypertension, prevalence of newly discovered cases and to identify some risk factors associated with arterial hypertension among a sample of apparently healthy workers in Hilla Textile Company.

This was a case control study conducted on a sample of randomly selected 70 hypertensive workers as cases and 140 non hypertensive (healthy control group), data were collected using a structured questionnaire which included socio-demographic information, life style habits studied as potential risk factors, the prevalence of hypertension was calculated among the study group , the duration of the study extended from September 2014 through January 2015.

This study showed that the overall prevalence of hypertension was 33% and it was higher in male workers 37% . the main risk factors that were significantly associated with hypertension were central obesity (OR=5.053), positive family history of hypertension (OR=2.184), diabetes mellitus (OR=5.4), drinking beverages (OR=2.403), smoking, alcohol consumption, using non-steroidal anti-inflammatory medications regularly and inactivity. there were no significant associations (P<0.05) between hypertension and the following variables: place of residence, educational level marital status and the gender of workers. In conclusion this study showed that hypertension is positively linked to positive family history of hypertension, central obesity, regular drinking beverages and inactivity.

Key words: Hypertension , risk factors ,Textile workers, Hilla, Iraq

عوامل الاختطار لضغط الدم للعاملين الأصحاء ظاهريا لعمال منشأة نسيج الحلة

الخلاصة

بعد ارتفاع ضغط الدم من الامراض غير المعدية التي تنتشر بتزايد ملحوظ في الدول النامية ومنها العراق , عواقب المرض ومضاعفاته خطيرة , ان اسباب المرض لا تزال غير واضحة رغم تعددها .

اهداف هذه الدراسة هي تحديد حجم المشكلة ومعدل الحالات الجديدة غير المكتشفة سابقا وتحديد بعض عوامل الخطورة المرتبطة بالمرض بين عينة من العمال البالغين والصحاء ظاهريا في معمل نسيج الحلة

هذه الدراسة هي دراسة الحالات والشواهد حيث تم اختيار عينة عشوائية من ٧٠ مريض من العمال البالغين بعد التأكد من اصابتهم بالمرض وفق معايير منظمة الصحة العالمية ومقارنتهم ب ١٤٠ من العمال الاصحاء كشواهد جمعت البيانات من خلال ورقة استبانة تضمنت معلومات ديموغرافية ومعلومات عن نمط الحياة للمجموعتين ومعلومات اخرى كعوامل خطورة محتملة للمرض، تم حساب معدل انتشار المرض الكلي للمرض ، امتدت الدراسة من شهر ايلول ٢٠١٤ الى نهاية شهر كانون الثاني ٢٠١٥.

اظهرت الدراسة ان معدل انتشار ارتفاع ضغط الدم هو ٣٣% وكان الاكثر بين الذكور وبمعدل ٣٧%، ان اهم عوامل الخطورة المرتبطة بالمرض كانت السمنة المفرطة وبنسبة ارجحية ٥.٥٣ وتاريخ العائلة الموجب للإصابة بالمرض وبنسبة ارجحية ٢.١٨٤ وارتبطت الإصابة بمرض السكري كعامل خطر وبنسبة ارجحية ٥.٤ وكذا الحال بالنسبة لتناول المشروبات الغازية ٢.٤٠٣ وكان الترابط الاحصائي مهم ومعنوي بين ارتفاع ضغط الدم والتدخين وتناول الكحول والتناول المنتظم لأدوية مضادات الالتهابات غير الستيرويدية. لم تثبت الدراسة وجود علاقة احصائية بين المرض والمتغيرات المعتمدة الاتية: السكن، المستوى التعليمي للمبحثن، الحالة الزوجية والنوع. نستنتج من الدراسة ان عوامل الخطر المرتبطة بضغط الدم المرتفع للعاملين في مصنع النسيج هي : السمنة المركزية، تاريخ العائلة الموجب للمرض، الإصابة بداء السكر، تناول المشروبات الغازية، التدخين وقلة الحركة.

الكلمات المفتاحية: ارتفاع ضغط الدم، عمال النسيج، الحلة، العراق.

Introduction

Hypertension (HT) is an independent risk factor for cardiovascular and kidney diseases and stroke [1]. It is very common, and its global prevalence being about 40% [2]. Hypertension, which plays a part in approximately 55% of the global mortality caused by cardiovascular diseases and in 7% of all disability-adjusted life year [3], it could be managed at fairly low cost, even in resource-poor settings [4,5]. In the developed world, more than 80% of people with hypertension are aware of their condition and receiving treatment [6,7]. However, the health systems in most developing countries fail to detect and manage hypertension effectively [8,9].

Hypertension is a major public health challenge and it is the most common primary diagnosis in USA with an estimated direct and indirect cost of hypertension is 46.4 billion \$ in 2010 [10]. Hypertension is the most prevalent medically treatable chronic non-communicable disease affecting adult population all over the world [11]. It is a growing worldwide problem [12]. In Iraq, its prevalence during the year 2005

was 14.4% [13]. Hypertension is responsible for at least 45% of death due to heart disease and 51% of death due to stroke, it needs more attention to help patient having better life and outcome [14,15]. Hypertension is referred to as "silent killer" because it is generally asymptomatic until there is end organ damage or found incidentally during routine blood pressure screening. Occasionally, headache, dizziness, visual disturbances, and palpitation could be the presenting symptoms [16,17].

Middle -income countries have higher prevalence and burden of HT than developed countries, as the numbers of people with HT who are undiagnosed, untreated and uncontrolled are higher [14,18]. In more than 95% of cases, a specific underlying cause cannot be found (primary hypertension). Hypertension is probably multi-factorial. It is more common in some ethnic groups especially Black Americans and Japanese, and nearly 40-60% are explained by genetic factors [19,20]. Increased vascular stiffness contributes to isolated systolic hypertension in elderly. The most important environmental factors include high salt intake, Heavy

consumption of alcohol, obesity, lack of exercise and impaired intrauterine growth[19, 20].

In about 5% of cases, hypertension can be shown as a consequence of a specific disease or abnormality (secondary hypertension) leading to sodium retention and / or peripheral vasoconstriction. The most potential risk factor for hypertension are obesity, alcohol consumption, pregnancy induced, renal disease, endocrine disease, drugs, coarctation of aorta and insulin resistance[21-25].

Materials and Methods

The approvals of research ethics committee was taken and the acceptance of factory authority was also gained. verbal consents of participants were taken as well. To start with, the research protocol has been discussed in details through a seminar conducted at textile factory in Hilla city. Data collection period was from September 2014 to January 2015.

Study subjects included 210 adult participants from both genders (70 cases and 140 controls). The total sample was collected out of 1632 workers by using systematic random sample techniques every 8 number were assigned to choose randomly the sample.

A case-control study design has been adopted to achieve the objective of this research. The disadvantage of this design could occur in selection of cases and/ or controls in addition no actual causation can be proved, only associations between disease and risk factors of interest can be detected(27).

A questionnaire form had been filled for each person through direct interview with

participant. The questionnaire pertained demographic, socioeconomic and lifestyle factors

and other information related to potential risk factors of hypertension.

A measurement of blood pressure (BP) for each participant was done using a mercury sphygmomanometer. measurement done on both arms and the mean reading of two measurements was recorded. Weight and height were measured for each patient in order to calculate the body mass index(BMI). After collection of data, body mass index estimation for each patient was done using the following equation: $\text{Body mass index} = \frac{\text{weight in Kg}}{(\text{height})^2 \text{ in meter}}$, measurement of the waist was done by using standard type measure to determine waist circumference, if the waist is 102 cm for male and 88cm for female, they considered centrally obese subjects (28). Systolic BP more than 140 mmHg and or Diastolic Bp more than 90 mmHg considered Hypertensive (28)..Smokers in this study are current smokers and those who quit smoking within one year from the beginning of the study.

A subject was categorized as “active” if he or she engaged in 30 minutes of moderate activity at least five times per week or in 20 minutes of vigorous activity at least three times per week. All other subjects were considered to be “not active”.

Worker who drink more than three cans or bottles of soft drink per week regularly was considered (soft drink consumer).

Inclusion Criteria for cases : Adult hypertensive participant is that participant whose age ≥ 35 years and known to be hypertensive (on treatment or not i.e. controlled or not) for more than one year.

Inclusion criteria for control group : Adult normotensive participant is that participant whose age ≥ 35 years and known to be normotensive for more than one year (without any antihypertensive therapy) and proved

to be normotensive after measuring his(her) blood pressures in three occasions .

Data entered and analyzed, using statistical package for social science program (SPSS software version 20), and data presented in figures, tables, frequencies, percentages and cross tabulation. Odds Ratio (OR) was calculated. The Chi-square (χ^2) test used to test the association between the variables. The association considered statistically significant when the p-value is less than 0.05.

Results

Table (1) shows that the overall prevalence of hypertension among a sample of apparently adult (>35years of age) healthy workers who were randomly selected in Al-Hilla textile factory was 33%, the prevalence among males is 37% while the prevalence among females was 28%.

The rate of newly discovered cases of hypertension 25.7% Table (2) shows that there are no significant differences between the age groups of both cases and control ($p>0.05$) this reflects that both groups are age matched.

Similar findings are found regarding the gender of the study groups as well as the difference in the places of residence ($p>0.05$). Marital status and the type of work are insignificantly associated with hypertension Chi Square = 0.043, $df=1$ $p=0.837$, OR=1.06 There is no statistical significant differences of the occupation variable

between cases and control groups $p=0.837$, OR= 1.06 Table (3) explains the associations between hypertension and the lifestyle habits such as: tobacco smoking which is more prevalent among hypertensive workers but this difference does not reach the significant statistical level OR=1.35, $p=0.366$. Family history of hypertension is positively associated with hypertension among the study group OR=2.184 this association is statistically significant $p=0.007$ Overweight and obesity significantly associated with hypertension $p=0.007$, central obesity is highly and strongly related to hypertension OR=5.053, $p=0.001$).

Drinking beverages is correlated positively and significantly with this disease (OR=2.403, $P=0.006$). This table reveals that 22.9 % of cases were physically active compared with 29.3 %among the control group (OR=0.715, $p=0.323$) this shows that physical activities is a protective factor for hypertension. Alcohol consumption proportion is more among cases compared to the control healthy group (OR= 3.513) this means that alcohol drinkers are about three folds more liable to develop hypertension compared to nonalcoholic individuals . The same table shows that there is a statistical significant associations between hypertension and diabetes mellitus, diabetics are five times more likely to have (HT)(OR=4.5, $p=0.001$).

Table (1): The prevalence of hypertension among the study population , by gender and the newly discovered cases

Gender	Hypertensive	normotensive	total	prevalence
male	47	80	127	37 %
female	23	60	83	28 %
Both Gender	70	140	210	33 %

Number of newly discovered cases- 18

**Newly discovered cases rate = $18/70$
=25.71**

Table: (2) socio-demographic characteristics of cases and healthy control groups

Socio- demographic parameter		Case n =70		Control n =140		χ^2	P value	odds ratio
		No.	%	No.	%			
age group (in year)	35-45	32	45.7	76	54.3	1.373	0.241	0.709
	46-55	38	54.3	64	45.7			
Gender	male	47	67.1	80	57.1	1.952	0.162	1.533
	female	23	32.9	60	42.9			
Residence	urban	48	68.6	102	72.9	0.420	0.517	1.230
	rural	22	31.4	38	27.1			
marital status	single	1	1.4	4	2.9	3.946	0.267	
	married	66	2.9	6	4.3			
	divorced	1	1.4	0	0			
		1	27.1	46	32.9			
	widow	2	52.9	56	40			
education state	illiterate	1	18.6	38	27.1	5.646	0.130	
	primary	19	67.1	92	55.7			
	secondary	37	32.9	48	34.3			
	Graduated	13						
occupation	worker	47				0.043	0.837	1.066
	employer	23						

Table(3) frequency distribution of study population according to personal and familial characteristics

personal/familial parameters		Case n =70		Control n =140		χ^2	P.value	odds ratio
		No.	%	No.	%			
Cigarette smoking	smoker	20	28.6	32	22.9	0.818	0.366	1.350
	non smoker	50	71.4	108	77.1			
Alcohol consumption	drinker	5	7.1	3	2.1	3.184	0.074	3.513
	non drinker	65	92.9	137	97.9			
physical activity	active	16	22.9	41	29.3	0.975	0.323	0.715
	inactive	54	77.1	99	70.7			
	+ve	42	60	57	40.7			
Family history for HT	-ve	28	40	83	59.3	6.966	0.0078	2.184
	≤ 25	12	17.1	38	27.1			
	25.1-29.9	16	22.9	50	35.7			
Body mass index	≥ 30	42	60	52	37.2	9.861	0.007	
	+ve	32	45.7	20	14.3			
	-ve	38	54.3	120	85.7			
Central obesity	+ve	18	25.7	10	7.1	24.742	0.001	5.053
	-ve	52	74.3	130	92.9			
	Diabetic							
	present	28	40	43	30.7	13.929	0.001	4.500
	absent	42	60	97	69.3			
	daily	27	38.6	29	20.7			
History of CVA	driving					1.798	0.180	1.504
	little	43	61.4	111	79.3			
Beverage consuming	driving					7.610	0.006	2.403
	+ve	39	55.7	42	30			
	-ve	31	44.3	98	70			
Medication NSA	excessive salty diet	34	48.6	79	56.4	13.023	0.001	2.935
	little salty diet	36	51.4	61	43.6			
	familial dietary pattern							
						1.159	0.282	0.729

Discussion

This study shows that the prevalence of hypertension is high among working population this is higher than what was reported by another local study in Iraq (13).

Males have higher rate than females this finding is similar to the findings of other studies (28).

Among the important risk factors of hypertension in our study are obesity especially central obesity, this finding is in consistent with the finding of other study (29).

Positive family history of hypertension proved to be a risk factor of hypertension this result agreed with the result reported by Yassen in Missan Iraq (30). Diabetes Mellitus has a highly significant statistically association with hypertension, this finding is similar to the finding of other studies (31).

In the present study there is a significant association between hypertension and excess drinking of all kinds of beverages, This finding is in consistent with the finding of other study carried in USA which confirmed the association between drinking sugar sweated beverages and developing hypertension (32).

Using medications is associated significantly with hypertension. Tobacco smoking (cigarette, Shisha and mixed tobacco smoking) is related to hypertension but this relation is weak (OR=1.350) other studies proved that this bad habit is positively associated with hypertension (33) smoking causes immediate increase in blood pressure (both systolic and diastolic) and the heart rate persists to increase for about 15 minutes after one cigarettes, there is currently no evidence that smoking cessation directly reduces blood pressure in people with hypertension the weak relationship between hypertension and smoking in our study may be related to the limitation of this

study because of the small sample size due to limited time of the study (34, 35).

Alcohol consumption shows that regular alcohol drinking has a significant statistical association with HT in the current study (OR = 3,513) this agrees with findings of other studies conducted in and outside Iraq (28,33,34,35).

Other independent variables such as place of residence, types of occupation and levels of education are not associated significantly with this chronic disease ($p > 0.05$), this finding is similar to the result reported by other study done in AL-Ain city in United Arab Emirate (31).

Conclusions

This study reveals that hypertension is a highly prevalent disease and it is more common in male workers. This study shows that one quarter of workers were not aware about their hypertension (newly diagnosed). the following risk factors are positively and significantly associated more common among the diseased workers: positive family history of hypertension, obesity especially central obesity, diabetes mellitus, excessive drinking of beverages and using medications regularly, there are no significant associations between hypertension and other variables; place of residence, marital status and education of workers, types of jobs

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