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RESEARCH ARTICLE

PREVALENCE AND RISK FACTORS OF HYPERTENSION AND OBESITY IN JEDDAH, SAUDI ARABIA.

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Abstract

Introduction: Obesity has been highlighted as a risk factor for hypertension a number of times in several recent reviews. Hypertension in kingdom of Saudi Arabia has become an increasingly important health problem affecting more than one fourth of the population. The relation between obesity and hypertension as a risk factor has not been studied among population of Jeddah city, Saudi Arabia .

Objective: The main objective of this study was to assess the prevalence of hypertensive patient living in Jeddah, Saudi Arabia. In addition, the relation between the ratio of obese patient with hypertension, also to prevent and delay the development of complications within the next 5-10 years.

Method: A randomized Cross-sectional study was carried out among 3230 in Al Balad, A historic festival in Jeddah city, Saudi Arabia. A questionnaire, weight and height scales were used to collect the data of demographic and anthropometric characteristics using standardized tools, adjusted prevalence of hypertension were calculated across gender specific quintiles of body mass index (BMI)and risk factors. Data were analyzed using Statistical Package for the Social Sciences, version 22.0.

Results: Total of the 3230 adult respondents, (54.5%) were females, and (83.3%)were Saudis. The majority of participants were 35 years and younger (68%), followed by the age group of 36-49 years old (19%). We found that 12% of the sample population were diagnosed with HTN while 78% (including the 12%) reported having a family history. Of the total 3230 population sampled, at least 73.3% had increased BMI (30.9% overweight, 21.9% obese, 4.9% morbidly obese).

Conclusion: Hypertension and obesity are both an important public health challenge in both economically developing and developed countries. Obesity was associated with an increased prevalence of hypertension. Obesity is not only deduced to be a risk factor for

developing Hypertension, but is also a risk factor for development of complications in those already diagnosed with Hypertension. Blood pressure measurements should be part of routine clinical examination especially in obese population.

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Introduction:-

Hypertension is an important risk factor for many health conditions including coronary heart disease and stroke, and as many as 35% of atherosclerotic events may be attributable to hypertension.¹ It is well known that obese individuals are more likely to be hypertensive than non-obese individuals.² Obesity has been highlighted as a risk factor for hypertension a number of times in several recent reviews³. The main mechanism causing sustained hypertension is sodium retention from the renal tubules³.

Although with little scientific evidence, the pathophysiological aspects of hypertension show that high blood pressure is linked to body weight gain, because excess fat helps to increase sympathetic nervous activity as certain fat hormones like leptin are responsible for increasing the sympathetic tone which affects the renal sodium re-absorption, which, in turn, increases renin-angiotensin system activity⁴. This in turn increases the glomerular filtration rate which results in decreased sodium excretion and hence elevated blood pressure⁴. Moreover, insulin resistance (hyperinsulinemia) may cause increased blood pressure, since insulin contributes to circulation through vasodilatation, a phenomenon that shows to be dedicatory in obese individuals.⁴

The close association between excess adipose tissue and hypertension is well documented, with population-based studies showing excess adiposity as the strongest known risk factor for hypertension in male and female subjects of different ages and races.⁵⁻⁹ Hypertension & BMI is of particular interest in developing countries as excess cardiovascular mortality among lean hypertensive subjects has become an increasingly important health problem among population. An early detection and management of the risk factors limits the damage to the heart and arteries. The present study was undertaken to measure the prevalence of hypertension and its association with obesity and to determine the prevalence of moderate risk factors of hypertension. It also aimed to educate those who are at risk and modify their lifestyle to a better and healthy life and follow them after 5 years.

Material and Methods:-

Jeddah is one of the biggest city in the kingdom of Saudi Arabia with multi-cultural residents. Being such an important city, a commercial hub and dramatically growing in rate where we chose this beloved city, a randomized study cross-sectional study carried out in Al-balad during Ramadan where most of the people visits for the historic Jeddah festival in the time period of 6/6/2016 – 3/7/2016.

Study Subjects:

Inclusion criteria included

- Adults above 20 years old.
- Both Saudi and non-Saudi respondents

Exclusion criteria:

- Alcohol consumption.

Data Collection Methods

Data collection methods in this study were through a questionnaire, weighing scale, Stadiometer (Height scale), All measurements were taken by trained medical interns and paramedics with reliable instruments. Verbal consent taken after which the questionnaires been filled using computer-based application. Then the participant obtained the remaining measurements which were hand-filled on a prepared sheet and coordinated with the questionnaire format.

Results:-

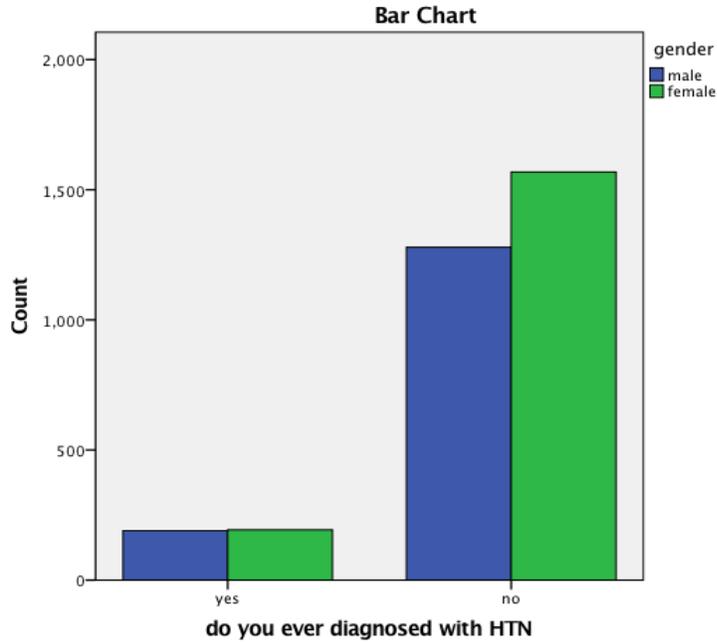
Total of the 3230 adult respondents, (54.5%) were females, and (83.3%) were Saudis. The majority of participants were 35 years and younger (68%), followed by the age group of 36-49 years old (19%). 85.1% of whom were Saudi, with a slight female predominance (50.4%). We found that 11.9% of the sample population was diagnosed with HTN while 78% (including the 12%) reported having a family history. Of the total population sampled, at least 73.3% had increased BMI (30.9% overweight, 21.9% obese, 4.9% morbidly obese). Prevalence of overweight and obesity was 30.9% overweight, 21.9% obese, and 4.9% morbidly obese in our population with females having more obesity as compared to males. And the prevalence of hypertension among obese population was 25.36% which clearly state the association between obesity and hypertension.

Any one of your family diagnosed with this diseases?

Category	N	%
	Total = 3230	
No diseases	327	10.1
DM	406	12.6
DM, HTN, HD	433	13.4
DM, HTN, HD, Stroke	143	4.4
HTN, CAD, HD	16	0.5
DM, HD	93	2.9
HTN,HD, Stroke	9	0.3
CAD, HD	11	0.3
DM, HTN, Stroke	132	4.1
HTN, HD	46	1.4
DM, CAD, HD	19	0.6
DM, stroke	26	0.8
HTN	188	5.8
DM, CAD	13	0.4
DM, HTN, CAD, Stroke	20	0.6
Stroke, HTN	30	0.9
DM, HD, Stroke	14	0.4
HTN, CAD	12	0.4
HD, Stroke	1	0
CAD	7	0.2
HD	45	1.4
Stroke	14	0.4
CAD, HD, DM, HTN, Stroke	122	3.8
DM, HTN, CAD, HD	179	5.5
DM, HTN, CAD	58	1.8
DM, HTN	866	26.8

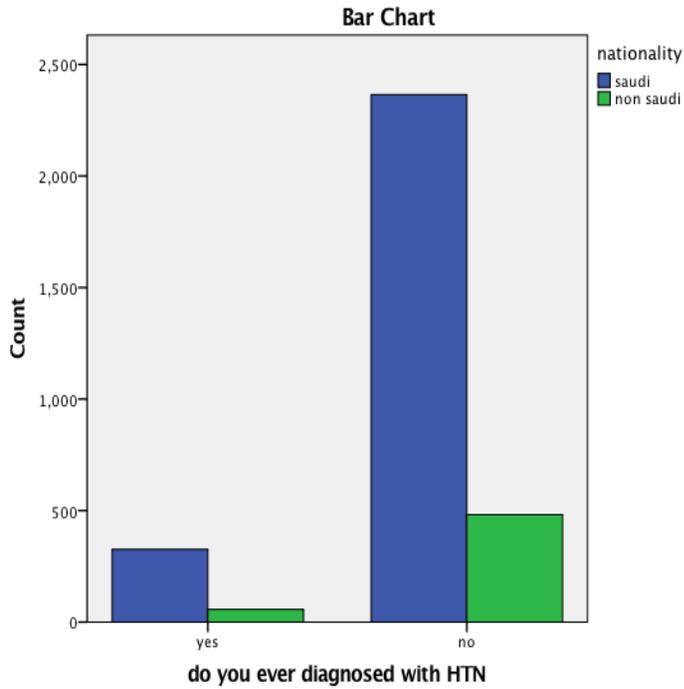
Do you ever diagnosed with HTN * gender?

		Gender		Total
		Male	Female	
do you ever diagnosed with HTN	yes	190	193	383
	no	1279	1568	2847
Total		1469	1761	3230

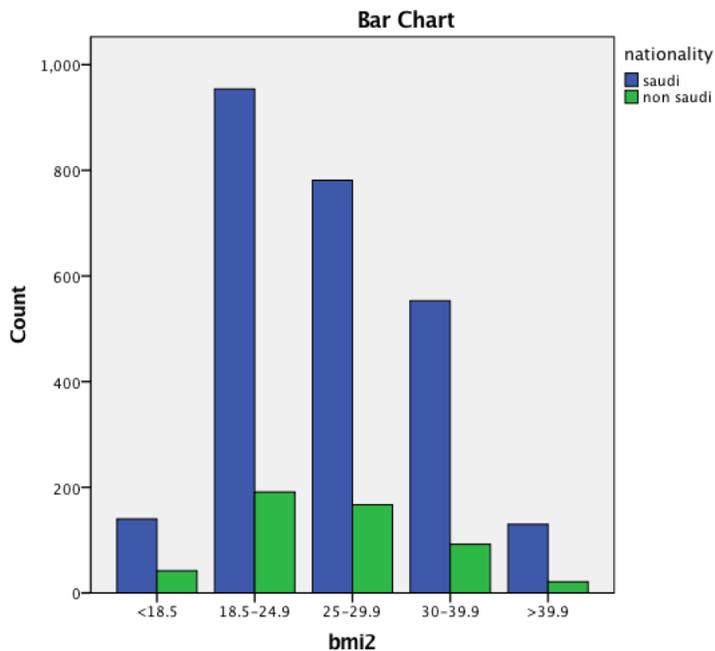


Do you ever diagnosed with HTN * nationality

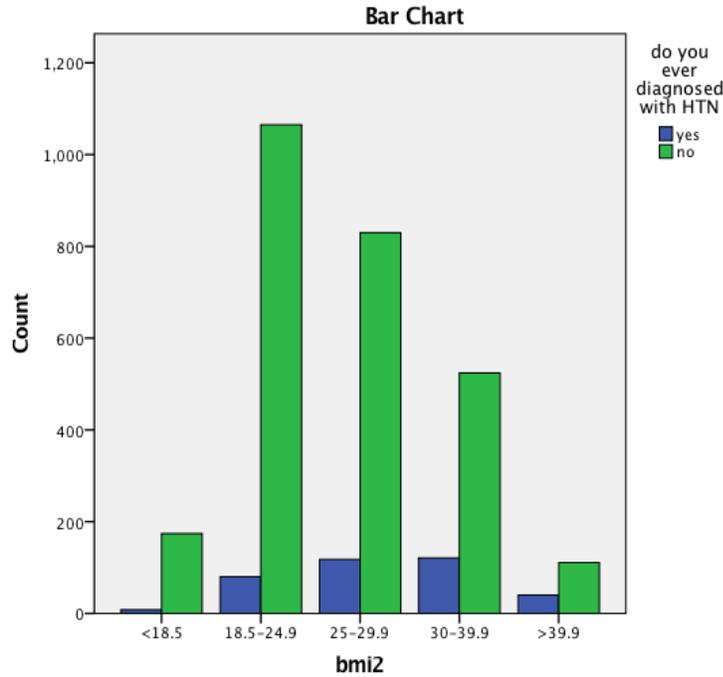
		Nationality		Total
		Saudi	Non Saudi	
Do you ever diagnosed with HTN	yes	326	57	383
	no	2365	482	2847
Total		2691	539	3230



BMI * Nationality		Nationality		Total
		Saudi	Non Saudi	
BMI	<18.5	140	42	182
	18.5-24.9	954	191	1145
	25-29.9	781	167	948
	30-39.9	553	92	645
	>39.9	130	21	151
Total		255	513	3071
		8		



BMI * Do you ever diagnosed with HTN		do you ever diagnosed with HTN		Total	OR	P- value
		yes	no			
BMI	<18.5	8	174	182	0.587	0.000*
	18.5-24.9	80	1065	1145		
	25-29.9	118	830	948		
	30-39.9	121	524	645		
	>39.9	40	111	151		
Total		367	2704	3071		



BMI * gender		Gender		Total
		Male	Female	
bmi2	Underweight	58	124	182
	Normal	491	654	1145
	Overweight	485	463	948
	Obese I	329	316	645
	Obese II	61	90	151

Discussion:-

In this study, the research population included 3230 Saudi and non-Saudi respondents, 383 of whom diagnosed with hypertension (11.9 %). Data was collected on a pre-designed, structured schedule (which included socio-demographic details) by interview technique by the investigators themselves and medical interns after ensuring the confidentiality of the information. Respondents were called for anthropometric measurements and variables such as weight (kgs), height (cms), BMI (kgs/m²). From our data, we found that 11.9% of the sample population was diagnosed with HTN while 78% (including the 12%) reported having a family history. Of the total population sampled, at least 73.3% had increased BMI (30.9% overweight, 21.9% obese, 4.9% morbidly obese). With the available reviews of Obesity being a risk factor for development of hypertension and obesity being prevalent in the community, we need to follow up with education and control measures in order to prevent increase in prevalence of Hypertension and its complications. This should be followed by another collection of similar data after five years of follow-up.

Conclusion:-

Hypertension and obesity are both important public health challenge in both economically developing and developed countries. Obesity was associated with an increased prevalence of hypertension. Obesity is not only deduced to be a risk factor for developing Hypertension, but is also a risk factor for development of complications in those who already diagnosed with Hypertension. Continuous research is required consisting each factor of obesity that is said to contribute to the development of hypertension in order to find further ways to prevent it. Until then, prevalence of obesity must be reduced in the community by conducting awareness campaigns, mass education, and

awareness on social media. Blood pressure measurements should be part of routine clinical examination especially in obese population .

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