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Research Article

**HYPERTENSION AND ITS ASSOCIATED MORBIDITY
AMONG ELDERLY POPULATION IN NORTHERN
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Abstract:

Background: Certain unique health problems develop with increasing age like hypertension, diabetes mellitus, cardiovascular diseases, cerebrovascular accidents, obesity, dyslipidemia and various malignancies. **Objectives:** to estimate the prevalence of hypertension and its associated morbidity in elderly population of Arar city, Kingdom of Saudi Arabia. **Methods:** Data was collected from 252 elderly participant aged 60 years and above, attending 5 randomly selected primary healthcare centers in Arar city, during the period from 1 March to 30 June 2018. Participants were selected using a systemic random sampling procedure as we take every 2nd patient. Collected data was analyzed using the SPSS program Version 22. P value of less than 0.05 was considered statistically significant.

Results: Our study found that the prevalence of hypertension among elderly population was 45.6%, it was more prevalent among females by 54.8% than males 45.2% but there was no difference significant ($p=0.246$). As regards relations between hypertension and age group, 63.5% of hypertensive patients were 60-70 years old, 26.1% 71- 80 years old and only 10.4% more than 81 years old, but there was non-significant correlations ($p=0.492$). There were 18.3% of hypertensive patients had DM ($p=0.875$). As regards the BMI, the majority (47%) of hypertensive patients were obese, 29.6% underweight, 20.9% over weight and only 2.6% were normal ($p=0.082$).

Conclusion: In Arar city, KSA, about half (45.6%) of the elderly population were hypertensive. Hypertension was more prevalent among females, in 60-70 years age group, about fifth of them were diabetics and about half of them were obese.

Key words: Hypertension, associated morbidity, elderly, Northern Saudi Arabia.

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INTRODUCTION:

Hypertension is one of the non-communicable diseases, which is an important global public health problem. Globally, cardiovascular disease (CVD) became the leading cause of mortality in 2013 and was responsible for nearly one-third of all deaths [1]. In the meantime, hypertension, which is considered to be the most crucial risk factor for CVD, has caused half of cardiovascular mortality and morbidity and led to 9.4 million deaths per year [2]. Additionally, approximately 40% of adults who were 25 and above were diagnosed with hypertension around the world [2].

WHO has termed hypertension as the Silent Killer, it may exist for prolonged periods in the individual without symptoms and may manifest only after causing serious irreversible pathology and complications. High blood pressure is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), normal blood pressure is a systolic BP < 120 mmHg and diastolic BP < 80 mmHg. Hypertension is defined as systolic BP level of ≥ 140 mmHg and/or diastolic BP level ≥ 90 mmHg [2].

Aging is a natural biological process which is associated with deterioration of health status of elderly people. Ageing is known as a process of deterioration in the functional capacity of a person that results from structural changes, with advancement of age [3].

Over the last twenty years, Saudi Arabia has witnessed major socioeconomic development leading to significant changes in its standard of living and lifestyle. The transformation of the society has also resulted in changes in dietary habits and related social practices. This has been compounded by a lack of exercise among large segments of the society. These factors and others have contributed to the emergence of life style-related diseases, including hypertension and diabetes mellitus [4].

In southwest Saudi Arabia, Al-Modeer study found that, the most prevalent cardiovascular disease was hypertension (59.1%), its prevalence among males was 63.7% compared to 55.5% in females [8].

In Fayum, Egypt, hypertension was the second prevalent disease (37.4) with more prevalence among males 19.3% than Females 18.2% [6].

This study was carried out to estimate the prevalence of hypertension and its associated morbidity in elderly population of Arar city, Kingdom of Saudi

Arabia.

PARTICIPANTS AND METHODS:

The present cross sectional study was conducted in Arar city, the capital of Northern Borders Governorate. The sample size was calculated using the sample size equation: $n = z^2 p (1-p) / e^2$, considering target population more than 1000, and study power 95%.

Data was collected from 252 elderly participant aged 60 years and above, attending 5 randomly selected primary healthcare centers in Arar city. They were selected using a systemic random sampling procedure as we take every 2nd patient.

Each participant was interviewed separately, and confidentiality was assured. Health centers provide healthy and sick citizens with healthcare services in an acceptable atmosphere of both privacy and confidentiality.

DATA COLLECTION:

Data were collected by means of personal interview with the sampled elderly using a predesigned questionnaire covering the following items:

- Socio-demographic characteristics including age, sex, educational and marital status.
- Smoking status and certain of diseases that may be prevalent among elderlies suggested to affect cardiovascular system diseases such as diabetes mellitus, renal diseases and thyroid gland diseases.
- Questions regarding the previously diagnosed hypertension and its determinants, after ensuring the diagnosis by reviewing the accompanied health reports and prescriptions and asking the caregivers about the case.
- Anthropometric examination included height and weight measurements with the use of a calibrated balance beam scale and a wall-mounted stadiometer and calculation of Body Mass Index.

Ethical considerations

Data collector gave a brief introduction to the participants by explaining the aims and benefits of the study. Informed written consent was obtained from all participants. Anonymity and confidentiality of data were maintained throughout the study. There was no conflict of interest.

STATISTICAL ANALYSIS:

We utilized the statistical package for social sciences (SPSS Inc., Chicago, Illinois, USA), version 22, to

analyze the study data. The results were displayed as counts and percentages. The X^2 test was used as a test of significance, and differences were considered significant at P value less than 0.05.

RESULTS:

Our study found that the prevalence of hypertension among elderly populations was 45.6%. As regards relations between hypertension and age group our study found that 63.5% of hypertensive patients were 60-70 years old, 26.1% 71- 80 years old and only 10.4% more than 81 years old ,but there was non-significant correlations ($p=0.492$). Another study

reported, high blood pressure is more prevalent in age group above 80 years (61.2%) and it was statistically significant ($p \text{ value} < 0.05$) Regarding to relations between gender and hypertension this study reported that it more prevalent among females by 54.8% than males 45.2% and there was no difference significant ($p=0.246$). Our study found that 18.3% of hypertensive patients had DM ($p=0.875$). According to relations between BMI group and hypertension our study reported that the majority of hypertensive patients were obese 47%, 29.6% underweight, 20.9% over weight and only 2.6% were normal but with non- difference significant ($p=0.082$).

Table (1): socio-demographic characteristics of the studied elderly population, Arar, 2017

Variable	Responses	Frequency (No.)	Percent (%)
Sex	Female	131	52.0
	Male	121	48.0
Age group	60-70	169	67.1
	71-80	61	24.2
	>80	22	8.7
Marital status	Widow	82	32.5
	Single	5	2.0
	Married	159	63.1
	Divorced	6	2.4
Educational level	Illiterate	121	48.0
	Primary	50	19.8
	Preparatory	21	8.3
	Secondary	20	7.9
	University or more	40	15.9

Table (2): prevalence of hypertension, BMI group, smoking, diabetes mellitus, renal diseases and stroke among the studied elderly population, Arar, 2017

Variable	Responses	Frequency (No.)	Percent (%)
Hypertension	Yes	115	45.6
	No	137	54.4
BMI group	Underweight	6	2.4
	Normal	61	24.2
	Overweight	71	28.2
	Obese	114	45.2
Smoking	Non smoker	172	68.3
	Smoker	17	6.7
	Ex-smoker	63	25.0
Diabetes mellitus	Yes	46	18.3
	No	159	63.1
Renal diseases	Nephrectomy	4	1.6
	Diabetic nephropathy	14	5.6
	Chronic renal failure	4	1.6
	Renal insufficiency	16	6.3
	No renal disease	214	84.9
Stroke	Yes	12	4.8
	No	240	95.2

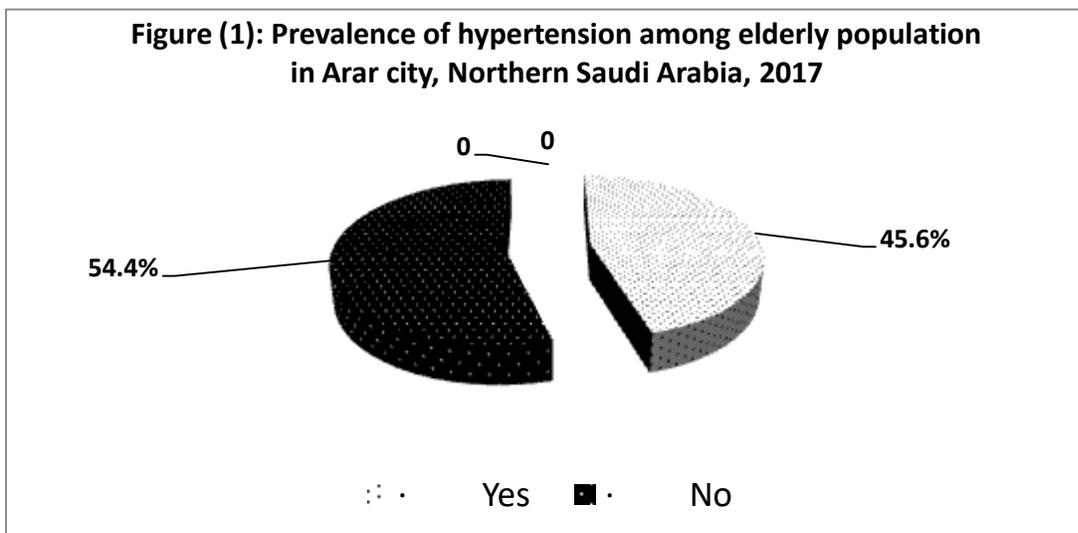


Table (4): relationship between Hypertension and BMI group, smoking, diabetes mellitus, renal diseases and stroke among the studied elderly population, Arar, 2017

Variables	Responses	Hypertension		Total (N=252)	P value
		Yes (N=115)	No (N=137)		
Age group	60-70	73	96	169	0.492
		63.5%	70.1%	67.1%	
	71-80	30	31	61	
		26.1%	22.6%	24.2%	
	81+	12	10	22	
		10.4%	7.3%	8.7%	
Sex	Female	63	68	131	0.246
		54.8%	49.6%	52.0%	
	Male	52	69	121	
		45.2%	50.4%	48.0%	
Marital status	Widow	44	38	82	0.072
		38.3%	27.7%	32.5%	
	Single	0	5	5	
		.0%	3.6%	2.0%	
	Married	69	90	159	
		60.0%	65.7%	63.1%	
Divorced	2	4	6		
	1.7%	2.9%	2.4%		
Educational level	Illiterate	70	51	121	0.001
		60.9%	37.2%	48.0%	
	Primary	20	30	50	
		17.4%	21.9%	19.8%	
	Secondary	7	13	20	
		6.1%	9.5%	7.9%	
	University or more	6	34	40	
		5.2%	24.8%	15.9%	
	Preparatory	12	9	21	
		10.4%	6.6%	8.3%	

Table (3): relationship between Hypertension and socio-demographic characteristics of the studied elderly population, Arar, 2017

Variables	Responses	Hypertension		Total (N=252)	P value
		Yes (N=115)	No (N=137)		
BMI group	Underweight	3	3	6	0.082
		2.6%	2.2%	2.4%	
	Normal	34	27	61	
		29.6%	19.7%	24.2%	
	Overweight	24	47	71	
		20.9%	34.3%	28.2%	
Obese	54	60	114		
	47.0%	43.8%	45.2%		
Smoking	Non smoker	90	82	172	0.007
		78.3%	59.9%	68.3%	
	Smoker .	5	12	17	
		4.3%	8.8%	6.7%	
	Ex-smoker	20	43	63	
		17.4%	31.4%	25.0%	
DM	Yes	21	25	46	0.875
		18.3%	18.2%	18.3%	
	No	71	88	159	
		61.7%	64.2%	63.1%	
Stroke	Yes	6	6	12	0.491
		5.2%	4.4%	4.8%	
	No	109	131	240	
		94.8%	95.6%	95.2%	
Renal diseases	Nephrectomy	4	0	4	0.042
		3.5%	.0%	1.6%	
	Diabetic nephropathy	4	10	14	
		3.5%	7.3%	5.6%	
	Chronic renal failure	0	4	4	
		.0%	2.9%	1.6%	
	Renal insufficiency	7	9	16	
		6.1%	6.6%	6.3%	
No renal disease	100	114	214		
	87.0%	83.2%	84.9%		

DISCUSSION:

This is across sectional study was conducted among 252 of studied elderly populations in Arar city, Northern Saudi Arabia. The study aim to estimate the prevalence of hypertension and its associated morbidity in elderly population of Arar city, Kingdom of Saudi Arabia.

Our study found that the prevalence of hypertension among elderly populations was 45.6%. Our results were higher than another study conducted in Jeddah among 243 participants which reported (22.6%) had hypertension [7]. In Al-Qassim region, Kingdom of Saudi Arabia another study conducted among 1114 persons; the prevalence of hypertension was 30% [8].

Another study conducted among 4758 subjects, the overall prevalence of hypertension was 25.5% [9]. In Nigeria, a descriptive cross-sectional design study involved 806 respondents aged from 18-90 years; the overall prevalence of hypertension was 33.1% [10]. There were other studies reported high prevalence of hypertension among elderly populations. In Shanghai, China: a cross-sectional study carried out among elderly populations; 59.9% of participants had hypertension [11]. A descriptive cross sectional study included a sample from Tabriz population, in North-West of Iran; among 1071 individuals included in this study, 724 (67.6%) had hypertension [12].

In Nepal, another study conducted among 318 elderly

people; 56.9% were found to be hypertensive [13]. In Greece, the results of the Nemea Study conducted by Skliros et al.[14] indicated that hypertension prevalence in the elderly aged >65 years old was 69%. In Singapore a nationally representative survey carried out among 4441 elderly Singaporeans, nearly three-fourths (73.9%) of them had hypertension [15].

As regards relations between hypertension and age group our study found that 63.5% of hypertensive patients were 60-70 years old, 26.1% 71- 80 years old and only 10.4% more than 81 years old, but there was non-significant correlations ($p=0.492$). Another study reported, high blood pressure is more prevalent in age group above 80 years (61.2%) and it was statistically significant ($p \text{ value} < 0.05$) [16]. Another study found that as age increases, the prevalence of hypertension significantly increases ($p < 0.001$) [9]. In Jeddah another study found that the incidence of HTN across the different age groups revealed strong evidence of an increasing probability of HTN with increasing age ($p = 0.001$) [7]. Another study reported, age distribution of hypertension showed the highest prevalence (71.1%) in the ≥ 60 years age-group, while the lowest prevalence (14.7%) was recorded in the 18–29 years age-group, this difference was statistically significant ($P \leq 0.001$) [10].

Regarding to relations between gender and hypertension this study reported that it more prevalent among females by 54.8% than males 45.2% and there was no difference significant ($p=0.246$). In Iran, another study reported that hypertensive individuals were significantly more likely to be female 56.9% ($p < 0.001$) [8]. Sheth AM et al. [16] reported, Prevalence of hypertension was as high as 48.5% in females compared to males 38.9% and it was statistically significant ($p < 0.05$). However, another study reported, the prevalence of hypertensive males was significantly higher than hypertensive females 27.1% and 23.9% respectively, ($p=0.013$) [9]. Another study reported that prevalence of hypertension was slightly higher for males (36.8%) compared to females (31.1%), this difference was however not statistically significant ($P = 0.097$) [10].

Our study found that 18.3% of hypertensive patients had DM ($p=0.875$). This was less than reported by another study which found that 26.5 of hypertensive patients had DM ($p < 0.001$) [12]. Another study reported that diabetics subjects have significantly higher hypertension prevalence ($P < 0.001$), there were 53.6% of hypertensive patients had DM [9].

Our result showed that from hypertensive patients the majority 78.3% were smokers, 17.4% ex-smokers and only 4.3% smokers with significant associations ($p=0.007$). Another study found that the prevalence

of hypertension among those who smoke currently (59.4%) and those smoked in the past (44.0%) was higher than those who never smoked (36.1%), this difference was found to be statistically significant [16]. Another study showed that for smoked tobacco products, there is a significant association ($P = 0.002$) between hypertension and current smoking status where nonsmokers have significantly higher hypertension prevalence [9]. Among current smokers themselves, nondaily smokers have lower hypertension prevalence compared to daily smokers, but differences were not significant ($p=0.163$) [9]. Another study reported, prevalence of hypertension was higher among smokers 11 (42.3%) compared to nonsmokers 256 (32.8%), the association was not statistically significant ($P = 0.312$) [10].

According to relations between BMI group and hypertension our study reported that the majority of hypertensive patients were obese 47%, 29.6% underweight, 20.9% over weight and only 2.6% were normal but with non- difference significant ($p=0.082$). Another study found that BMI status was statistically associated with hypertension ($P \leq 0.001$); obese respondents had the highest prevalence (51.4%), while the under weights had the lowest prevalence (28.6%) [6]. Another study reported that body mass index increases, prevalence of hypertension increases ($P < 0.0001$) [9]. Another study reported that the prevalence of HTN increased proportionally with BMI, an HTN prevalence of 15.2% in overweight patients and of 36.4% in obese patients [7].

CONCLUSION:

In Arar city, KSA, about half (45.6%) of the elderly population were hypertensive. Hypertension was more prevalent among females, in 60-70 years age group, about fifth of them were diabetics and about half of them were obese. Early and good control of hypertension is recommended. Also we recommend that, policy makers must condense their efforts to increase the awareness campaigns to protect and treat those hypertensive patients and all the groups of the population who are at high risk from this disease and its subsequent morbidities. In addition, we recommend large scale community based study about the disease in all areas of Saudi Arabia.

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