The characteristics and comorbidities of chronic diseases in patients visiting in a major governmental clinic in Riyadh, Saudi Arabia.

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Abstract

Background: The objective of the study was to describe the characteristics and comorbidities of chronic diseases in patients visiting a major governmental clinic in Northern Riyadh, Saudi Arabia.

Methods: This descriptive cross-sectional study examined 183 patients visiting a major governmental clinic in northern Riyadh, Saudi Arabia. The visits were conducted between December 2019 and January 2020. A predesigned data extraction sheet was used to collect data from electronic medical records for baseline demographics of patients and clinical features of diagnosed diseases.

Results: The mean age of patients was 60.25 years (SD ±12.3). The mean systolic and diastolic blood pressure was 130.97 mmHg (SD: 12.26) and 68.72 mm Hg(SD: 2.16) respectively. The mean body mass index (BMI) was 31.78 kg/m2 (SD: 6.48). On categorizing BMI values, 104 (59.4%) patients were obese and 55 (32.4%) were overweight. The majority of the patients had dyslipidemia (83.6%). Female patients significantly suffered from arthritis and hypothyroid more than males (34.4% vs 4.7%, p-value <0.001 and 26.7% vs 8.2%, p-value 0.001) respectively. However, other chronic diseases did not show any differences with respect to gender. With respect to age group, hypertension (78.9% vs 21.1%, p value <0.001), dyslipidemia (88.9% vs 11.1%, p value 0.05), diabetes (77.8& vs 22.2, p value 0.05) were significantly higher among individuals from the age group of 60 and older. With respect to comorbidity, the most common comorbidity associated with diabetes was hypertension (71%, p = 0.015), while 87.2% of individuals with dyslipidemia were also diagnosed with diabetes (p = 0.03).

Conclusion: Dyslipidemia was found to be the most frequent chronic condition, followed by diabetes, Hypertension, arthritis and other health conditions (cancer, depression, anxiety, and dementia). Hypertension, dyslipidemia and diabetes were more commonly found in elderly patients (≥60years). Comorbidity was also predominant in our study population. The significant comorbidity of diabetes with both hypertension and dyslipidemia among visitors of primary healthcare settings necessitates the selection of appropriate treatment strategies that aim to control these three conditions together while minimizing the number of adverse effects related to interactions between medications. There is also a need for a greater nation-wide study to extrapolate these findings to Saudi primary healthcare settings.

Keywords: Clinical Characteristics; Chronic Diseases; Governmental Family Medicine Clinics; Saudi Arabia

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1. Introduction:

Saudi Arabia has certainly experienced a significant economic growth in the past three decades. By the same time, Saudi Arabia has also witnessed a tremendous paradigm shift in the occurrence and determinants of chronic diseases, a major representation of which is the adoption of unhealthy lifestyle habits. This, regrettably, includes non-communicable diseases like diabetes mellitus, cardiovascular disease, and obesity, which cause metabolic abnormalities and initiate a vicious cycle of cellular and tissue dysfunction [1].

The increasing influx of patient admission, particularly with non-communicable chronic diseases, is an urgent healthcare concern globally [2-4]. Needless to say, hospital admissions especially frequent ones not only exhaust healthcare services but also add strain to healthcare budgets, including those of caregivers and family members [5]. Research studies describing the disease characteristics of patients can help determine the patterns of healthcare resource utilization. In addition, registry-based or population-based studies are required in order to recognize the precise estimation of chronic disease burden, incidence, prevalence, mortality, and resource allocation. Accordingly, they are crucial for designing healthcare policies. However, research studies are lacking globally, owing to a dearth of trustworthy data, healthcare registry databases and experts in the field [6].

The healthcare system in Saudi Arabia is highly regarded as one of the best in the Middle East [6]. Unfortunately, the chronic disease burden and the status of comorbidities in the Saudi Arabian population who visit primary care facilities remain poorly recognized. The consideration of visiting patients with specific baseline and clinical features as well as chronic non-communicable diseases can help determine the acute needs of both clinics and hospitals. This would also guide the mobilization of resources and aid in devising policies that could minimize suffering by improving access to healthcare.

Therefore, the present study aims to identify and document the clinical characteristics and comorbidities of chronic diseases in patients visiting a major primary governmental family medicine clinic of Northern Riyadh, Saudi Arabia. The findings of the present study may provide valuable data regarding the burden of chronic disease and comorbidities within the Saudi community. They may also assist physicians, primary healthcare management, public health experts and health policy makers to ponder mindful decisions with reference to personalized and population-based patient care and the forecasting of healthcare services.

2. Material and Methods:

This descriptive cross-sectional study retrospectively included 183 patients with chronic diseases who visited a major governmental family medicine clinic in northern Riyadh, Saudi Arabia. The study was conducted between December 2019 and January 2020. Electronic medical records were also reviewed for the baseline and clinical features of patients.

Confidentiality of the patients was maintained and data extracted for research purposes were anonymized in order to conceal the patients' identities. Computer-based data were password protected and access to the research data was only available to research team members.

A predesigned data extraction sheet was used to collect research data. The analyses included demographics (age [years] and gender) and clinical characteristics (body mass index [BMI, kg/m^2], blood pressure [mmHg], and pre-existing diseases [%]).

Data entry and analysis were performed using Statistical Package for Social Sciences (SPSS) software version 25 (SPSS Inc., Chicago, Illinois, USA). Data were presented as mean ± standard deviation (SD) for continuous variables, and as frequency and percentages for categorical variables. The chi-square test was used to check the comorbidity status associated with diabetes and other diseases.

3. Results:

The total available data were of 183 patients, 94 (51.4%) of whom were female, with a mean age of 60.25 years (SD: 12.3). The mean systolic blood pressure was 130.97 mmHg (SD: 12.26) and the mean diastolic blood pressure was 68.72 mmHg (SD: 12.16). The mean BMI of the study participants was 31.78 kg/m2 (SD: 6.48). On categorizing BMI values, 104 (59.4%) patients were obese and 55 (32.4%) were overweight (Table 1).

Table 1: Baseline and clinical characteristics of patients (n=183)

Baseline and clinical characteristics	Frequency	Percentage
Age (years)*		
Mean (SD)	60.25 (12.3)	
≤60	81	47.4
≥61	90	52.6
Gender*		
Male	85	48.6
Female	90	51.4

BMI (kg/m^2)*		
Mean (SD)	31.78 (6.48)	
Normal	13	7.6
Underweight	1	0.6
Overweight	55	32.4
Obese	101	59.4
Blood pressure (mmHg)*		
Systolic (mean, SD)	130.97 (12.26)	
Diastolic (mean, SD)	68.72 (12.16)	

*Indicates missing data
Abbreviation: SD, Standard deviation; and BMI, Body mass index

Regarding past chronic diseases, diabetes was present in 72% of patients, HTN was present in 66% of patients, asthma was present in 12% of patients, arthritis in 20%, dyslipidemia in 83.6%, hypothyroidism in 18% and obesity in 12%, while other conditions (for example: cancer, depression, anxiety and dementia) were prevalent in 20.8% of the patients (Figure 1). Female patients suffered from arthritis and hypothyroid significantly more than males (34.4% vs 4.7%, p value<0.001 and 26.7% vs 8.2%, p value 0.001). However, other chronic diseases did not show any differences with respect to gender. With respect to age group, hypertension (78.9% vs 21.1%, p value <0.001), dyslipidemia (88.9% vs 11.1%, p value 0.05) and diabetes (77.8& vs 22.2, p value 0.05) were significantly higher among individuals aged 60 or older.

Figure 1: Prevalence of pre-existing chronic diseases (n=183)
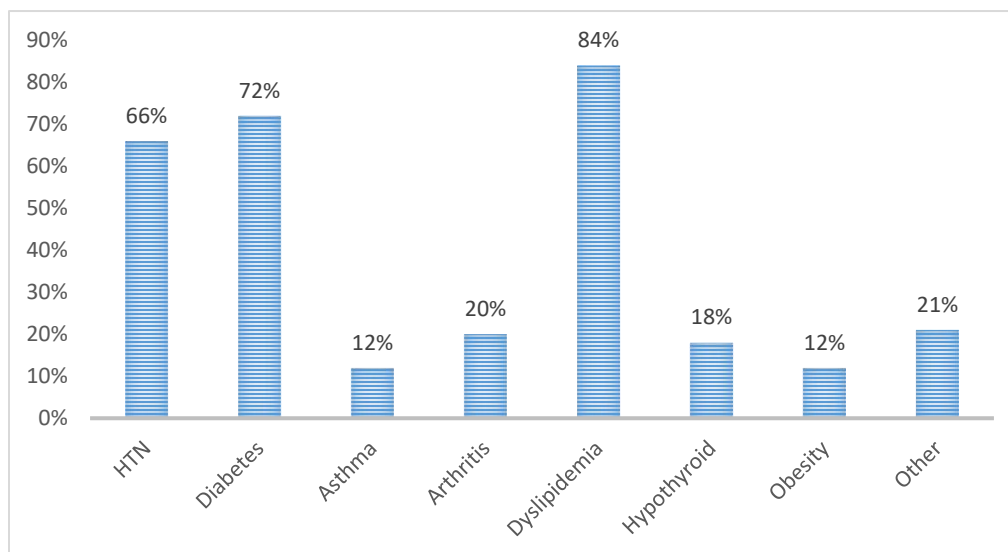
The prevalence of diabetes mellitus as a binary variable (0=yes diabetic; 1=no non-diabetic) was contrasted with other variables. Seven cross-tabulation (X2) tests were conducted to assess the relationship between the presence of diabetes and each of: hypertension, arthritis, asthma, hypothyroidism, obesity, dyslipidemia, and other diseases. The results are summarized in Table 2. Individuals with hypertension had a significantly higher percentage of diabetes (70.7%) compared to non-hypertensive individuals (29.3%, P-value 0.017). Similarly, there was a significantly high proportion of participants with dyslipidemia (87.2%) who had diabetes compared with their counterparts (12.8%, P-value 0.031). There was no significant association found between diabetes and other diseases. This included arthritis, asthma, hypothyroidism and obesity.

Table 2. Univariate Analysis regarding Diabetes status and comorbidity sample (n=183)

Variables	Non-diabetic	Diabetic	Total	Chi-Square (X^2)	p-value
	n (%)	n (%)	(n=183)		
Hypertension					
No	24 (48)	39 (29.3)	63 (34.4)	5.6	0.017
Yes	26 (52.0)	94 (70.7)	120 (65.6)		
Arthritis					
No	38 (76)	109 (82)	147 (80.3)	0.82	0.37
Yes	12 (24.0)	24 (18)	36 (19.7)		
Asthma					
No	43 (86)	118 (88.7)	161 (88.0)	0.26	0.61
Yes	7 (14.0)	15 (11.3)	22 (12)		
Dyslipidemia					
No	13 (26.0)	17 (12.8)	30 (16.4)	4.63	0.031
Yes	37 (74.0)	116 (87.2)	153 (83.6)		
Hypothyroidism					
No	40 (80)	111 (83.5)	151 (82.5)	0.30	0.58
Yes	10 (20.0)	22 (16.5)	32 (17.5)		
Obesity					
No	42 (84)	119 (89.5)	161 (88.0)	1.03	0.31
Yes	8 (16.0)	14 (10.5)	22 (12.0)		
Other					
No	31 (62.0)	96 (72.2)	127 (69.4)	1.77	0.18
Yes	19 (38.0)	37 (27.8)	56 (30.6)		

4. Discussion:

The findings of the current study, the first from northern Riyadh, demonstrate that dyslipidemia was the most prevalent chronic disease, followed by other health conditions (cancer, depression, anxiety and dementia), arthritis, hypothyroidism and obesity. The present study provides compelling evidence that the disease burden is swinging towards chronic diseases and underlines how dyslipidemia is responsible for the majority of admissions in this major primary governmental family medicine clinic in northern Riyadh in Saudi Arabia.

Research studies from developing nations have also documented an analogous shift towards chronic diseases as being responsible for major admissions [7, 8]. The acute adoption of westernized standards of living, such as sedentary lifestyle habits and consumption of fast foods—both globally and in Saudi Arabia—has unquestionably added to the ever-growing prevalence and incidence of chronic diseases [6].

Hypertension, one of the leading cardiovascular diseases worldwide, and the metabolic abnormality of obesity have substantially increased in developing countries [6]. Although this did not apply to mean diastolic blood pressure, mean systolic blood pressure was slightly higher in this study. Likewise, the mean BMI of the study subjects leaned towards overweight, which upon categorization of BMI values, revealed that 59.4% of the subjects were obese. In addition, 9.8% and 5.2% had borderline and high serum cholesterol levels respectively. Similar to other chronic diseases, diabetes and kidney disease were prevalent in the present study, with 55.1% of the subjects having an HbA1c of more than or equal to 6.5%, stage 3a CKD in 7.4% and stage 3b CKD in 1.7% of patients. One study reported diabetes mellitus diagnoses in 10.5% of hospitalized patients in Saudi Arabia [9]. Another study from Saudi Arabia by Elrewihby et al. (2018) communicated a high prevalence (10.2%) of acute kidney injury in hospitalized patients at King Abdul-Aziz Hospital, Makkah [10]. In agreement with the subclinical hypothyroidism prevalence among adults visiting primary healthcare settings [11], study patients also presented low levels of TSH (although they were hospitalized).

There is a notable increase in the elderly population around the world [12]. Aging is also linked with an exponential increase in comorbidity. Two thirds of the people at the retirement age have suffered from two or more chronic diseases [13, 14]. The studied population showed multiple comorbidities associated with diabetes. The most prevalent and significant comorbid conditions associated with diabetes included hypertensive and dyslipidemia. Hypertension is the

known comorbid condition associated with diabetes [15, 16]. Another study found that one third of individuals had both hypertension and diabetes [17]. Similarly, this study's results are consistent with most of the published studies where dyslipidemia was most found in diabetic individuals [18, 19]. A study found that the chances of developing dyslipidemia had significantly increased by nine times in diabetic individuals (OR = 9.27; 95% CI: 1.68–52.19, p = 0.019)[20].

The present study has a few notable limitations. The small sample size of patients included in this study restricts the generalizability of the study findings. In addition, statistically significant associations between diseases could have been missed due to the higher chance of type two statistical errors in hypothesis testing. However, this is the first study of its kind in northern Riyadh, Saudi Arabia. It delineates the nature of chronic diseases frequently encountered in outpatient clinics and the associations between such diseases in a major primary healthcare family medicine clinic in the northern region of the capital city, Riyadh.

5. Conclusion:

Dyslipidemia was found to be the most frequent chronic disease, followed by other health conditions (cancer, depression, anxiety and dementia), arthritis and hypothyroidism. The majority of patients also suffered from at least two chronic conditions. The most frequent combinations found in the studied population were diabetes-hypertension and diabetes-dyslipidemia. The significant comorbidity of diabetes with both hypertension and dyslipidemia among visitors of primary healthcare settings necessitates the selection of appropriate treatment strategies that aim to control these three conditions together, while minimizing the number of adverse effects related to interactions between medications. There is also a need for a greater nation-wide study to extrapolate these findings to Saudi primary healthcare settings

6. Declarations

6.1 Conflict of Interest Statement
None.

6.2 Funding Disclosure
None.

7. References:

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