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ADHERENCE TO SAUDI NEPHROPATHY SCREENING PROGRAM IN PRIMARY HEALTH CARE CENTER IN ALKHOBAR CITY

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Abstract:

Background: *Chronic kidney disease (CKD) affects approximately 13% of the adult population, resulting in significant morbidity, mortality and health care costs.*

Method: *A Cross-sectional study was conducted among Patients with type II diabetes or hypertension or both in chronic disease clinics (CDC) in PHC centers in Eastern Province to assess adherence to nephropathy screening guideline among physicians in chronic disease clinics.*

Results: *The study included 246 patients, the majority 51.6% was females. 40.2% of patients had type 2 diabetes mellitus, 24.4% had hypertension and 35.4% had both. There were only 26% of cases follow guideline in screening of nephropathy.*

Conclusion: *The study concluded that the majority of cases do not follow nephropathy screening guideline. We recommend decision makers to conduct further planning on increasing the adherence level and the outcomes of the screening program.*

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BACKGROUND:

Chronic kidney disease (CKD) is a major health problem in Saudi Arabia. There has been a noticeable rise in the prevalence and incidence of end stage chronic kidney disease (CKD) in Saudi Arabia over the last three decades. This rise exceeds those reported from many countries. Diabetic nephropathy and hypertensive nephropathy are the two major causes of CKD (43%, and 36% respectively). Deaths from ESRD were 2.21% annually. Of those 12% dying with CKD in Saudi Arabia annually, we estimated that two thirds were diabetics.[1]

The prevalence of diabetic nephropathy among dialysis patients in Saudi Arabia has increased by 162% in the last twenty-five years.[1] Hypertension, on the other hand, affects more than 25% of the adult Saudi population.[2] Perform an annual test to assess urine albumin excretion in all type 2 diabetic patients starting at diagnosis. Measure serum creatinine at least annually in all adults with diabetes regardless of the degree of urine albumin excretion. [3]

According to NICE guidelines, CKD is classified into 5 grades based on glomular filtration rate (GFR) and Albumin Creatinine Ratio (ACR) : (Normal : 90<=, Mild : 89-60, Moderate: 59-30, Severe : 29-15 and :Kidney Failure: 15>=).[4]

Kidney disease often has no symptoms in its early stage, therefore, adherence to nephropathy screening program plays a vital role in early detection, intervention, and treatment.

Frequency of requesting renal profile based on Saudi National Nephropathy screening guidelines (as recommendation from American Diabetics Association ADA2017)[5,6], is to be run annually for all patients, every 6 months if eGFR 45-60 ml/min/1.73m^2, every 3 months if eGFR 30-44 ml/min/1.73m^2.

LITERATURE REVIEW:

Microalbuminuria is considered the earliest sign of Diabetic nephropathy. In Saudi National diabetic registry study which was done in 54,670 type 2 diabetic patients, 10.8% of them have diabetic nephropathy divided into 1.2% Microalbuminuria, 8.1 Macroalbuminurea and 1.5% End Stage Renal Disease. [7]

By the end of 2008, there were 10,203 patients on hemodialysis, 966 on peritoneal dialysis, and 7836 with functioning kidney grafts. Of the current patients on hemodialysis, 42.5% were diabetic. The prevalence of renal replacement therapy (RRT) has increased from 361 per million population (PMP) in 1995 to 874 PMP in 2008. Over the same period, the dialysis patient prevalence has increased from 187 to 463 PMP. The prevalence of ESRD in the USA increased from 1150 PMP in 1995 to 1698 PMP in 2007 and in dialysis from 710 to 1076 PMP.[2]

A cross sectional study was done in Netherlands and carried out on 15,954 patients with type 2 diabetes or hypertension showed that the prevalence of CKD was 28% in patients with diabetes and 21% in patients with hypertension.[8]

Screening for CKD in primary care is low as Data from 2001 to 2004 showed that in Netherlands only 33% of patients with hypertension or diabetes are screened yearly for serum creatinine, and 10% of patients with diabetes are screened for albuminuria.[8]

Cross-sectional study carried out in India showed that most physicians reported performing routine urinalysis annually on the majority of their patients as recommended by the ADA. Most 86% of physicians reported conducting urinalysis on more than half of their type 1 patients as did 82% for their type 2 patients. Approximately 85% of physicians who screen their patients for albuminuria reported using urine dipsticks most often.[9]

OBJECTIVE:

To assess adherence to nephropathy screening guideline among physicians in chronic disease clinics.

SUBJECTS & METHODS:

Study design, setting and period: The study is a cross-sectional study carried out on Patients with type II diabetes or hypertension or both in chronic disease clinics (CDC) in 4 different PHC centers in Eastern Province from the period of January to July, 2019. The PHC centers are Aljiser District PHC, Alaqrabiyah PHC, Ibn Hayan PHC, Alkhozama PHC.

Sample size: We assumed prevalence 50%, a precision 5%, an alpha level of 5%, the calculated minimum sample size is 246 patient's file.

Inclusion Criteria: Patients' files in chronic disease clinic for male and female, diagnosed with type II diabetes, hypertension or both with or without other comorbidities.

Exclusion Criteria: Type I diabetes mellitus and other chronic diseases.

Sampling technique: Accredited trainees of the family medicine training program from the PHC centers were collecting the data through unified data extraction sheets.

Data collection tools: Data extraction sheet designed for the purpose of this study will be used. The form contained variables such as Age, Sex, Smoking status, Blood pressure (BP), HbA1C, creatinine level, eGFR, proteinuria, Urine albumin creatinine ratio (UACR) and referral.

Study procedures: Then, we collected the total number of type II DM, hypertensive patients or both in chronic disease clinics who follow up regularly from all centers. After that, we selected the consecutive sample from the total.
Data was collected by using data extraction sheet through reviewing medical records which were filled by investigators. Recommended tests data were collected for the past one year (from January to December 2018). The study was carried out during December 2018.

Data management and statistical analysis: The collected data were entered and analyzed using the Statistical Package for the Social Science (SPSS Inc. Chicago, IL, USA) version 23. Descriptive statistics was performed. Percentages were given for qualitative variables and Mean (±SD) were given for quantitative variables. The primary study outcome (prevalence of adherence to DN screening according to Saudi Guidelines) were presented as percentage and 95% CI.

Ethical consideration: Privacy of patients' information and confidentiality were carefully maintained. We received approval from family medicine joint program director which was given to primary health care center managers to conduct our study.

RESULTS:

Table (1): The study included 246 patients, the majority 51.6% was females and 48.4%males. There were 73.2% Saudi and 26.8% non-Saudi. There majority of patients were never smoker 76.4% followed by 18.7% smokers and only 4.9%were ex-smokers. 40.2% of patients had type 2 diabetes mellitus, 24.4% had hypertension and 35.4% had both. Blood pressure was controlled in 69.9 %of patients. HbA1c was >=7 in 41.9% of patients, <7 in 31.7% and not done in 25.2%of them. More than half of patients (56.9%) had serum creatinine (1) in past 1 years, 67.5% had 0 ACR number and 93.5%of them had 0 proteinuria in past 1 year.

Table (2): Regarding to guideline following, there were 26% of cases follow guideline in screening.

Table (3): 16.3% of patients had moderate (60-89) eGFR, 11.4% had high (>=90) eGFR and 10.6% had low (<60) eGFR. In males 25.6% had normal creatinine levels followed by high in 6'9% of them however, in females the majority (21.5%) had high level in creatinine followed by normal in 13% of them.

Table (4): As regards relation between guideline following and sociographic characters, there were no significant correlations with age and gender. Also, there was no relation found with diagnosis of patients and nationality (P>0.05).

Table (1): Patients' clinical data (N=246)

VARIABLE	NO.	%
Primary Health Care Center (PHC)		
• Aljiser District PHC	62	25.2
• Alaqrabiyah PHC	66	26.8
• Ibn Hayan PHC	57	23.2
• Alkhozama PHC	61	24.8
Gender		
• Male	119	48.4
• Female	127	51.6
Age Groups (years)		
• ≥70	29	11.8
• 51-69	135	54.9
• ≤50	82	33.3
Nationality		
• Saudi	180	73.2
• Non-Saudi	66	26.8
Smoking		
• Current smoker	46	18.7
• Never smoker	188	76.4
• Ex-smoker	12	4.9
Diagnosis		
• Type II DM	99	40.2
• Hypertension	60	24.4
• Both	87	35.4
BP Control (Based on the last 3 readings)		
• Controlled	172	69.9
• Uncontrolled	33	13.4
• N/A	41	16.7
HbA1C (Latest value in the past 1 year)		
• <7	78	31.7
• ≥7	103	41.9
• Not done	62	25.2
• N/A	3	1.2
Number of serum creatinine in past 1 year		
• None	69	28.0
• 1	140	56.9
• 2	30	12.2
• 3	7	2.8
Number of ACR in past 1 year		
• None	166	67.5
• 1	61	24.8
• 2	15	6.1
• 3	4	1.6
Number of proteinuria in past 1 year		
• None	230	93.5
• 1	13	5.3
• 2	3	1.2

Table (2): Guideline following; frequency and 95% CI.

GUIDELINES FOLLOWED	NO.	%	95% CONFIDENCE INTERVAL (CI)
Followed	64	26.0	
Not Followed	182	74.0	(20%-32%)

Table (3): Distribution of the results of eGFR and Serum Creatinine levels in males and females.

VARIABLES	NO.	%
eGFR		
• High (>=90)	28	11.4
• Moderate (60-89)	40	16.3
• Low (<60)	26	10.6
• Total	94	38.2
• N/A	152	61.8
Mean (+SD)	77.5(27.0)	
Creatinine Levels Males (N=89)		
• High	17	6.9
• Normal	63	25.6
• Low	9	3.7
• Missing	28	5.3
Mean (+SD)	89.64(22.16)	
Creatinine levels (Females) (N=127)		
• High	53	21.5
• Normal	32	13.0
• Low	2	.8
• N/A	40	64.6
Mean (+SD)	94.9(29.9)	

	GUIDELINES FOLLOWING		TOTAL (N=246)	P VALUE
	Followed (n=64)	Not Followed (n=182)		
Age Group (years)				
• ≥ 70	10 (34.5%)	19 (65.5%)	29 (100.0%)	0.538
• 51-69	34 (25.2%)	101 (74.8%)	135 (100.0%)	
• ≤50	20 (24.4%)	62 (75.6%)	82 (100.0%)	
Gender				
• Male	31 (26.1%)	88 (73.9%)	119 (100.0%)	0.553
• Female	33 (26.0%)	94 (74.0%)	127 (100.0%)	
Diagnosis				
• Type II DM	29 (29.3%)	70 (70.7%)	99 (100.0%)	0.607
• Hypertension	15 (25.0%)	45 (75.0%)	60 (100.0%)	
• Both	20 (23.0%)	67 (77.0%)	87 (100.0%)	
Nationality				
• Saudi	47 (26.1%)	133 (73.9%)	180 (100.0%)	0.548
• Non-Saudi	17 (25.8%)	49 (74.2%)	66 (100.0%)	

DISCUSSION:

Chronic kidney disease (CKD) is a major global health problem with an increasing prevalence, due to aging of the population and rising incidence of hypertension and diabetes [10]. CKD is associated with a high risk of cardiovascular morbidity, mortality and deterioration to end-stage renal disease (ESRD) [11]. CKD represents a significant public health problem, with nearly 20 million people in the United States having kidney damage or reduced kidney function [12]. More than 400,000 people currently receive some form of renal replacement therapy, and this number is expected to reach 2.2 million by the year 2030 [13]. Chronic kidney disease (CKD), defined as either decreased glomerular filtration rate (GFR) or albuminuria, or both [11]. Also, it is defined by indicators of kidney damage—imaging or proteinuria (commonly using albumin to creatinine ratio, ACR)—and decreased renal function (below thresholds of GFR estimated from serum creatinine concentration) [14, 15].

Diabetes and hypertension are major causes of CKD [16]. Therefore, current international guidelines recommend yearly screening for CKD in patients with diabetes or hypertension [17, 18]. Diabetes is the leading cause of CKD, demonstrated for 33% of the adult cases with CKD [19]. Nevertheless, 20% to 40% of diabetics will develop diabetic nephropathy during the end stage of their disease [20]. The initial presentation of diabetic kidney disease is microalbuminuria followed by increasing severity of proteinuria as the glomerular filtration membrane is damaged [21]. Also, hypertension represents a powerful risk factor for CKD and is almost fixedly found in patients with renal failure. Sodium retention and activation of the renin-angiotensin system have been regarded as the most effective mechanisms implicated in the rising of blood pressure in patients with CKD [22].

Guidelines can be defined as a document that streamlines particular processes according to a regular routine. In the medical context it refers to a document which seeks to guide decisions and criteria regarding diagnosis, management/treatment in specific areas of healthcare [23]. Guidelines identify, summarize and evaluate evidence of the highest quality and the most up-to-date data about prevention, diagnosis, prognosis, therapy including dosages of medications, risk/benefit and cost-effectiveness [24]. There are a variety of barriers to guideline adherence, of which the doctor, patient and practice factors play an important role. According to adherence to guidelines in screening of nephropathy, our study reported that there were 26% of cases followed guidelines in screening. Generally, compliance with screening for CKD by primary care providers is low [25]. Another study found that overall, adherence by GPs to the guideline recommendations regarding a consultation or referral was low [26]. Also, another study reported only 8.3% of the patient's recommendations from CKD guidelines with respect to consultation and referral to specialist care were followed [27]. However, another study conducted among patients with type II diabetes reported; compliance rate for microalbuminuria screening was 56.3% which was higher than the quoted national average of 14–49% [28].

Currently, screening for chronic kidney disease is accepted practice only in patients with hypertension or diabetes, [29] but more widespread screening is increasingly proposed [30]. The United Kingdom chronic kidney disease guidelines also recommend at least annual screening of all adults at risk of obstructive kidney disease and those with prevalent cardiovascular diseases, [31] while the US kidney disease outcomes quality initiative (US KDOQI) guidelines use age >60 for additional inclusion [14]. Both guidelines highlight the risk associated with multisystem diseases and nephrotoxic drugs. Although evidence to recommend routine screening is insufficient, the tests often suggested for screening CKD that are feasible in primary care include creatinine-derived estimates of glomerular filtration rate (GFR), as well as urine testing for albumin (micro- or microalbuminuria) [32]. Current Kidney Disease: Improving Global Outcomes (KDIGO) guidelines encourage clinicians to monitor both GFR and albumin annually—more frequently in selected patients—to consider the risk of disease progression and therapeutic management [33].

Regarding to screening tests, our study found that 16.3% of patients had moderate (60-89) eGFR, 11.4% had high (>=90) eGFR and 10.6% had low (<60) eGFR. In males 25.6% had normal creatinine levels followed by high in 6'9% of them however, in females the majority (21.5%) had high level in creatinine followed by normal in 13% of them.

As regards relation between guideline following and sociographic characters, our study found that there were no significant correlations with age and gender. Also, there was no relation found with diagnosis of patients and nationality (P>0.05).

CONCLUSION:

The study concluded that the majority of cases do not follow nephropathy screening guideline. Therefore,

we recommend decision makers to conduct further planning on increase awareness to physicians and patient about importance of nephropathy screening program , and making physicians perform all the screening measures according to the provided guidelines in order to increase the adherence level and the outcomes of the screening program.

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