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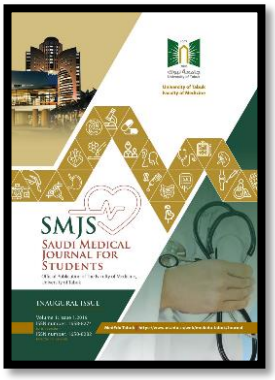

ORIGINAL RESEARCH ARTICLE

END STAGE RENAL DISEASE CASES SURVEY AMONG DIALYSIS PATIENTS IN TABUK CITY, KSA, 2019: A CROSS SECTIONAL STUDY

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ABSTRACT

Background: End-stage kidney disease (ESKD) is highly prevalent globally. The objective of this study was to determine the associated factors for chronic renal failure, types of and period of renal dialysis, complications after starting dialysis and causes of missing dialysis session in Tabuk City, northern area of Saudi Arabia.

Methods: A cross sectional study. The participants were the patients with ESRD on hemodialysis in the hemodialysis centers of Tabuk Hospitals. This study has been reviewed and approved by the Research Ethics Committee of Faculty of Medicine, Tabuk University. Data were analyzed using IBM SPSS Statistics for Windows version 20.

Results: 45.1% aged >50 years, 29.2% aged 41-50 years and 3.1% aged 21 or less. 53.3% were males and 73.3% weren't working. 23.6% of patients were hypertensive, 26.7 were both hypertensive and diabetic, 15.4% were diabetic. 52.8% under hemodialysis, 46.7% under both hemodialysis and peritoneal dialysis and only one case under peritoneal dialysis. Period of dialysis was >5 years in 32.8% of cases. Most (79.5%) of cases had complications after starting dialysis, as infection in 57.4% of cases, PE in 9.7%, infection and PE in 2.1%, MI in 2.6% and DKA in 2.1%. Causes of missing any dialysis session was depression in 10.8%, travelling in 14.4% and Social Issues in 4.1%.

Conclusion: This study found that the main factors associated to ESRD in Tabuk, KSA were diabetes mellitus, hypertension and chronic kidney disease. Most of cases had complications such as infection, pulmonary embolism, myocardial infarction and diabetic ketoacidosis

KEY WORDS: associated diseases, chronic renal failure, types of renal dialysis, complications, missing dialysis session, Tabuk City, Saudi Arabia.

INTRODUCTION

Chronic kidney disease (CKD) is a progressive irreversible structural damage and/ or kidney function. There are five categories of CKD in which stage 5 (End Stage Renal Disease (ESRD)) is the last and most serious stage [1]. End-stage kidney disease (ESKD) is highly prevalent globally. Despite the great progress in diagnosis of end-stage renal disease (ESRD) and the delivery of renal replacement therapy (RRT) the number of patients with chronic renal failure is increasing internationally [3].
Screening and surveillance of CKD, either population-based or targeted at-risk populations, have become important parts of CKD prevention strategies worldwide [4].

ESRD has many causes that vary from one patient to another. The most common causes include uncontrolled hypertension, glomerulonephritis, polycystic kidney disease, medications such as the use of some analgesics regularly over long durations, atherosclerosis leading to ischemic nephropathy, obstruction of the urinary tract by stones or cancer [5]. Diabetes mellitus type I and type II because diabetic nephropathy, that leads to kidney failure. Diabetes is the largest single cause of ESRD in the United Kingdom, accounting for 30– 40% of all cases[6]. Obese people have up to a seven times greater risk of kidney failure than non-obese people, so, obesity considered a risk factor for ESRD [7].

The treatment alternatives for ESRD include hemodialysis, peritoneal dialysis, and kidney transplantation. Dialysis is the most common treatment for ESRD, replacing the impaired filtering ability of the kidneys. Dialysis is a procedure that is performed routinely on persons who suffer from acute or chronic renal failure, or who have ESRD [8]. There are two ways to perform dialysis; peritoneal dialysis and hemodialysis. The latter can be performed at home or in a dialysis center or hospital by trained healthcare professionals [8]. The reported annual incidence of patients with ESRD varies widely, from as low as 4 persons per million population in Bolivia. Higher numbers 254 persons per million populations in Puerto Rico. Incidence rates of 52 person per million populations and 200 persons per million populations were reported in Turkey and Egypt, respectively [9].

Long duration of pre-ESRD Nephrology care, which is the period between the first time the patient has been seen by a nephrologist and the first dialysis, has a significant effect on the quality of life and survival rate in patients with ESRD before and after receiving renal replacement therapy (RRT) [10].

The objective of this study was to determine the risk factors for chronic renal failure, types of and period of renal dialysis, diseases lead to hospital admission after starting dialysis and causes of missing dialysis session in Tabuk City, northern area of Saudi Arabia.

MATERIALS AND METHODS

This study is a cross sectional study. The participants were the patients with ESRD on hemodialysis in the hemodialysis centers of Tabuk Hospitals during 2019. Data were collected from the patients of chronic renal failure, on dialysis (they were 195 patients) by personal interviews and filling a pre designed questionnaire which includes the questions that guide us to the needed data such as socio-demographic
information, family history of chronic kidney disease or renal failure, diabetes mellitus, hypertension, chronic kidney disease, patient history of any other chronic disease, screening of kidney diseases, smoking history, patient involvement in the treatment plan before dialysis, type of dialysis, history of complications during hemodialysis and causes of missing dialysis session.

This study has been reviewed and approved by the Research Ethics Committee of Faculty of Medicine, Tabuk University. The aim of the study was explained to all participants before filling the questionnaire to gain their confidence and the trust. Written consent was obtained from all participants before filling the questionnaire and after discussing the objective with them. Confidentiality and privacy were considered during interviewing for all participants, no names were recorded on the questionnaires and all questionnaires were kept safe.

Data were analyzed using IBM SPSS Statistics for Windows version 20.0 (Armonk, NY: IBM Corp.). Qualitative data were expressed as number and percentage. Percentages and frequencies were used to describe the demographic profile of the respondents and the answers regarding the chronic renal failure and renal dialysis.

RESULTS

Table 1 contains respondent demographic data. 45.1% aged >50 years, 29.2% aged 41-50 years and 3.1% aged 21 or less. 53.3% were males and 73.3% weren't working.
Table 2 contain patient history of chronic disease, screening of kidney diseases, current smoking and patient involvement in the treatment plan before dialysis. 23.6% of patients were hypertensive, 26.7 were both hypertensive and diabetic, 15.4% were diabetic, and 6.7% were diabetic, hypertensive and have cardiac disease. Period of chronic disease before dialysis was >5 years in 74.4% of cases, 55.9% of patients were informed about its effect on the kidney. 62.1% had history of screening for kidney diseases. Period of renal failure was>5 years in 38.5% of patients. The Patient was involved in the treatment plan in 82.1% of cases and the patient has an idea about different types of treatments in 78.4%.
Table (3) shows Renal dialysis related characteristics. As regards the types of dialysis, 52.8% under hemodialysis, 46.7% under both hemodialysis and peritoneal dialysis and only one case under peritoneal dialysis. Period of dialysis was >5 years in 32.8% of cases. Most (79.5%) of cases had a history of hospital admission after starting dialysis, reasons was infection in 57.4% of cases, 9.7% due to pulmonary embolism, 2.1% infection and pulmonary embolism, myocardial infarction 2.6% and diabetic ketoacidosis in 2.1%. the majority (67.2%) of patients reported dizziness during dialysis and 15.4% convulsions. Missing any dialysis session in 30.8% of cases, Causes was depression in 10.8%, Travelling in 14.4% and Social Issues in 4.1%

DISCUSSION

Chronic Kidney Disease can be caused by various etiological agents and is often a consequence of diabetes and hypertension. CKD which cannot be attributed to any known etiology is termed Chronic Kidney Disease of uncertain etiology [11]. Maintenance dialysis therapy is the commonest mode of renal replacement therapy and demand for this service is increasing progressively worldwide [12]. The impact of end-stage renal disease (ESRD) on public health and health care economics has been a global focus for years [13].

This study is a cross sectional study, carried out on patients with ESRD on hemodialysis in the hemodialysis centers of Tabuk Hospitals during 2019, to determine the risk factors for chronic renal failure, types of and period of renal dialysis, diseases lead to hospital admission after starting dialysis and causes of missing dialysis session in Tabuk City, northern area of Saudi Arabia.

According to our results, 23.6% of patients were hypertensive, 26.7 were both hypertensive and diabetic, 15.4% were diabetic, and 6.7% were diabetic, hypertensive and have cardiac disease. A study in Palestine reported that majority of patients were either diabetic (22.5%) or

hypertensive (11.1%) or both at the same time (10.6%). There were a considerable number of patients in whom the cause was undetermined (27.6%) [14]. These results did not agree with the study that was conducted in Palestine that showed that 50.8% of ESRD cases had hypertension [15]. Another study in Arar, KSA found that, 56.5% of cases and 17.4% of controls were hypertensive and 28.2% of hypertensive cases had hypertension for12 years and more [16]. This result is in accordance also with another study conducted in Kuwait that show hypertension is the fourth most common cause of end stage renal disease and elevation of the blood pressure is a strong independent risk factor for ESRD [17]. This result also does not agree with studies conducted in KSA that show hypertension was present in 24% in cases of ESRD [18].

Causes of mortality and hospitalization among ESRD patients usually result from infectious diseases or complications of dialysis, or chronic illness [19].
In our study, 79.5% of participants were admitted in the hospital after starting dialysis. 57.6% of patients admitted for infection, 9.7% for PE, 2.1% for both infection and PE, and 2.6% for MI. Two studies reported the causes of hospitalization. One study reported the majority cause of hospitalization was cardiovascular disease followed by vascular access related problems, while ischemic heart disease contributed to 19% of the total hospitalization [20]. Another study reported the main cause of hospitalization was vascular access related problems (34%) [21].

In our study, 67.2% of patients reported dizziness during dialysis and 15.4% convulsions. Common symptoms experienced by CKD patients are fatigue, pruritus, irritability, anxiety and nausea. An assessment of the symptom burden of all CKD patients is very important in clinical management [22].

In our study, 79.5% of participants were admitted in the hospital after starting dialysis. 57.6% of patients admitted due to infection, 9.7% for PE, 2.1% for both infection and PE, and 2.6% for MI. this results are supported by another study stated that, the overall incident PE was nearly 3-fold greater in dialysis patients than in the comparison cohort and are at greater risk of fatality from PE compared with those without clinical kidney disease. This study also shows a higher PE risk in HD patients than in PD patients [23]. Another study reported that, Dialysis patients are particularly vulnerable to infections caused by S. aureus. S. aureus accounts for >8% of the mortality in the dialysis population and is the leading cause of mainly VA-site–related infections and i*t* has the ability to colonize approximately half the dialysis population without any sign of disease but is also capable of causing wound and tissue infections [24]. Another study stated that, Dialysis poses an increased risk for infections as a result of impure dialysate, transient bacteremia caused by the VA, and iron overload. Dialysis catheters disrupt the normal skin barrier and form a gateway for bacterial entry into the bloodstream [25].

CONCLUSION

This study found that the main factors associated to ESRD in Tabuk, KSA were diabetes mellitus, hypertension and chronic kidney disease. Most of cases had complications such as infection, pulmonary embolism, myocardial infarction and diabetic ketoacidosis. The awareness of the disease and its progressing were severely lacking in the study group and it is needed to implement an awareness program in these regards to help the community avoid bad outcomes. The numbers of ESRD could be controlled in the kingdom if the risk factors associated were controlled.

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The author declares that there were no conflicts of interest of any type

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Table (1): Socio-demographic characteristics of the studied renal dialysis cases in Tabuk, KSA, 2019 (N=195). From the following centers : King Salman Armed Force Hospital Dialysis Center, King Khalid Civilian Hospital Dialysis Center and Davita dialysis center.

Variables	Frequency (No.)	Percent (%)
Age group		
▪ 21 or less	6	3.1
▪ 22-30	13	6.7
▪ 31-40	31	15.9
▪ 41-50	57	29.2
▪ >50	88	45.1
Gender		
▪ Male	104	53.3
▪ Female	91	46.7
Marital status		
▪ Single	44	22.6
▪ Married	151	77.4
Occupation		
▪ Working	52	26.7
▪ 73.3Not working	143	73.3
Educational Level		
▪ None	57	29.2
▪ Elementary	43	22.1
▪ Intermediate	28	14.4
▪ High	37	19.0
▪ College	30	15.4

Table (2): Patient history of chronic disease, screening of kidney diseases, diagnoses with kidney diseases, current smoking and patient involvement in the treatment plan before dialysis. From the following centers : King Salman Armed Force Hospital Dialysis Center, King Khalid Civilian Hospital Dialysis Center and Davita dialysis center.

Variables	Frequency (No.)	Percent (%)
Chronic disease before dialysis		
▪ No chronic diseases	16	8.2
▪ HTN	46	23.6
▪ DM	30	15.4
▪ DM and HTN	52	26.7
▪ DM, HTN and kidney disease	5	2.6
▪ DM, HTN, kidney disease and cardiac disease	1	.5
▪ DM, HTN and cardiac disease	13	6.7
▪ DM, HTN and others	1	.5
▪ DM and kidney disease	2	1.0
▪ DM, HTN and cardiac disease	1	.5
▪ HTN and kidney disease	11	5.6
▪ HTN and cardiac disease	2	1.0
▪ HTN and others	2	1.0
▪ Chronic kidney disease	11	5.6
▪ Others	2	1.0
Period of chronic disease before dialysis		
▪ <5 years	34	17.4
▪ >5 years	145	74.4
Patient informed about its effect on the kidney		
▪ Yes	109	55.9
▪ No	70	35.9
History of screening for kidney diseases		
▪ Yes	121	62.1
▪ No	74	37.9
Period of renal failure		
▪ <5 years	120	61.5
▪ >5 years	75	38.5
Regular follow up with a nephrologist before dialysis		
▪ Yes	127	65.1
▪ No	68	34.9
Patient involvement in the treatment plan		
▪ Yes	160	82.1
▪ No	35	17.9
Patient knowing about different types of treatments		
▪ Yes	140	71.8
▪ No	55	28.2
Current smoking		
▪ **Smoker**	29	14.9
▪ Non **smoker**	166	85.1
No. of packs/year		
▪ 0-5	3	1.5
▪ 5-10	5	2.6
▪ 10-15	5	2.6
▪ >15	16	8.2
▪ Not smoker	166	85.1

Table (3): Renal dialysis related characteristics among renal dialysis cases in Tabuk, KSA, 2019. From the following centers : King Salman Armed Force Hospital Dialysis Center, King Khalid Civilian Hospital Dialysis Center and Davita dialysis center.

Variables	Frequency (No.)	Percent (%)
Types of dialysis		
▪ Hemodialysis	103	52.8
▪ Hemodialysis and peritoneal dialysis	91	46.7
▪ Peritoneal dialysis	1	.5
Dialysis center D, M or K		
▪ D	60	30.8
▪ K	44	22.6
▪ M	91	46.7
Period of dialysis		
▪ <5 years	131	67.2
▪ >5 years	64	32.8
History of hospital admission after starting dialysis		
▪ Yes	155	79.5
▪ No	40	20.5
Reasons of hospital admission after starting dialysis		
▪ Infection	112	57.4
▪ Pulmonary embolism (PE)	19	9.7
▪ Infection	4	2.1
▪ Myocardial infarction	5	2.6
▪ Diabetic ketoacidosis (DKA)	4	2.1
▪ Others	11	5.6
▪ No admission	40	20.5
Receiving dialysis during admission		
▪ Yes	149	76.4
▪ No	46	23.6
History of dizziness during hemodialysis		
▪ Yes	131	67.2
▪ No	64	32.8
History of convulsion during hemodialysis		
▪ Yes	30	15.4
▪ No	165	84.6
Weight gain change between dialysis		
▪ <3Kg	176	90.3
▪ >3Kg	19	9.7
Type of access on initiation of dialysis		
▪ Catheter	177	90.8
▪ AVF	11	5.6
▪ AVG	7	3.6
Issues with dialysis access		
▪ Infection	82	42.1
▪ Clotting	2	1.0
▪ No issues	111	56.9
Missing any dialysis session		
▪ Yes	60	30.8
▪ No	135	69.2

Causes of missing dialysis session		
▪ Depression	21	10.8
▪ Depression and travelling	1	.5
▪ Travelling	28	14.4
▪ Travelling and social issues	2	1.0
▪ Social Issues	8	4.1
▪ No missing	135	69.2