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Research Article

Factor causing late referral of CKD patients to Nephrology care

Abstract

Introduction: Identification of the disease in its early period changes the outcome. Early reorganition of the chronic kidney disease and a timely referral to nephrologist also affects the prognosis of the disease. The factors which contribute in late referral are well known in the western population. There is a need to look into the factors in our population.

Methods: This cross sectional study was conducted in the nephrology unit of Dow university hospital and The Kidney center post graduate medical institute. A structured questionnaire was used to collect the data on sociodemographic characteristics. The stages of CKD were determined by the creatinine clearance or glomerular filtration rate at the time of first presentation at hospital. To measure association of stage of CKD with categorical study variables, chi-square test was executed. Level of significance was considered at 5%.

Results: Among the different stages of CKD, most of the patients (31.2%) first time presented in the hospital with stage V kidney disease; on the other hand only 8.7% of total patients came in stage 1. Gender, age, socioeconomic status and education were associated with late referral of the CKD patients in the hospital (p value≤ 0.05) while rural and urban residence was not associated with referral time of patients.

Conclusion: In conclusion we detected that in our population CKD patients were mostly referred late to nephrology care and the factors that lead to this late referral are increasing age, low socioeconomic status and illiteracy.

Introduction

World health organization showed great concern over morbidity and mortality caused by non-communicable diseases and emphasized them as global priority in a 2005 report. This report focused on cardiovascular diseases, chronic pulmonary conditions, cancers and diabetes which are causing 35 million deaths over a year. Early identification of these diseases change the worse outcomes [1]. Although not included in the agenda of WHO, CKD also has been recognized as an important non-communicable disease and health care problems [2]. Delayed awareness of the CKD, not only intensifies the mortality but also induces vascular, infectious, psychological and economical complications [3-6].

Among different components which intensify the worse outcome of CKD, late referral to nephrologist is of paramount importance .The factors which contribute this late referral are well studied in western population [7-9], but very few studies are available in developing countries. The differences in socioeconomic status, health facilities, education level, and provision of public health infrastructure make it impossible to generalize the finding of those studies to this population. Therefore, there is a need to evaluate those factor in this population as well.

There is disagreement on the definition of late referral, and it varies from 1 month to 6 months before the initiation of hemodialysis. KDICO recommended that patients with CKD should be referred to nephrologist when glomerular filtration rate (GFR) decline to less than 30 ml/min [10].

A timely referral to nephrology care improves patient's management in terms of monitoring progression of CKD, planning for the indication of renal replacement therapy and a comprehensive conservative management plan for these who do not opt hemodialysis [11]. The factors which affect referral time to nephrology care are recognized as male gender, diabetic or hypertensive kidney disease, occupation, low activity, and low financial support [12,13].

The aim of the study was to evaluate the factor which effect the referral time to nephrologist in developing country.

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Material and Method

This cross sectional study was conducted in the nephrology unit of Dow University of health sciences and The Kidney center post graduate medical institute. This is a sub analysis of the study designed to evaluate the risk factors for hospitalization in CKD patients (in press for publication).This study included all adult CKD patients, admitted to hospital or visited as outpatient during a period of eight months from May 2015 to December 2015. Principal investigator conducted a face-to-face interview in nephrology clinic and wards of both institutes. A structured questionnaire was used to collect the data on sociodemographic characteristics. The study included following demographic variable, like gender, age, area of residence, socioeconomic status and education. The time to referral to nephrologist was taken as a variable of stages of CKD, which were determined by the creatinine clearance or glomerular filtration rate at the time of first presentation at hospital and it was taken from patient's record. Creatinine Clearance (Cr. Cl) was evaluated by Cockcroft-Gault equation.

Statistical analysis

Data analyses were performed by using software IBM SPSS license version 21. Descriptive analysis of variables was presented in form of frequencies and percentages. To measure association of stage of CKD with categorical study variables, chi-square test was executed. Level of significance was considered at 5%.

Results

The study included 1052 patients in which female were 511(48.6%) while male were 541(51.4%) in numbers. Median age was 55, with minimum of 18 and maximum of 94 years. Larger part of total population of patients (86.8%) was residents of urban areas while 13.2% were residing in rural area. In context with education level, 59.9% were educated, while uneducated patients were 40.1%. Considering the different socioeconomic classes the patients who belonged to middle class were higher in number (53.8%). The majority of the patients (46.2%) were falling in age group from 41-60 years (Table 1). Among the different stages of CKD most of the patients (31.2%) first time presented in the hospital with stage V kidney disease, on the other hand only 8.7% of total patients came in stage 1 (Figure 1).

Gender was associate with the stage of CKD at the time of first presentation to the hospital (p value = 0.055) as females presented earlier in the hospital than males (Table 2).

Age was also highly associated with stage of CKD (p<0.001). Among the different age groups, 52.7% of patients from 18-40 years came early to the hospital (stage I), while 58.8% of the middle aged patients presented to the hospital in stage II. On the other hand, most of the old age patients came in stage III and stage IV of kidney disease (Table 3).

From the different socioeconomic classes, most of the patients who came early {stage I, II, III (a)} belonged to higher socioeconomic class. On the other hand lower socioeconomic group mostly presented late (stage V) and this different is statistically significant too (p = 0.029) (Table 4).

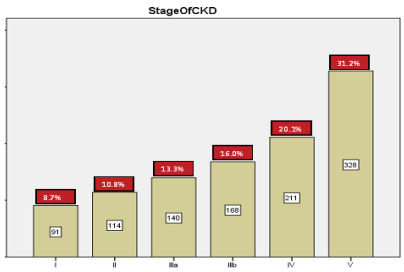

Figure 1: Stage of CKD at 1st Presentation

Table 1: Demography of CKD patients.

Variables	N (%)
Female	511 (48.6)
Male	541 (51.4)
Urban residents	913 (86.8)
Rural residents	139 (13.2)
Uneducated patients	422 (40.1)
Educated patients	630 (59.9)
Low socioeconomic status	298 (28.3)
Medium socioeconomic status	566 (53.8)
High socioeconomic status	188 (17.9)
18-40 years of age	217 (20.6)
41-60 years of age	486 (46.2)
>60 years of age	349 (33.2)

Table 2: Association of Gender with stages of CKD.

Stage of CKD	Gender		Total	*p* Value
	Female	Male		
I	44 (8.6)	47 (8.7)	91 (8.7)	0.055
II	57 (11.2)	57 (10.5)	114 (10.8)	
III (a)	75 (14.7)	65 (12.0)	140 (13.3)	
III (b)	91 (17.8)	77 (14.2)	168 (16.0)	
IV	108 (21.1)	103 (19.0)	211 (20.1)	
V	136 (26.6)	192 (35.5)	328 (31.2)	
Total	511 (100.0)	541 (100.0)	1052 (100.0)	

Table 3: Association of Age with stage of CKD.

Stage of CKD	Age Category			Total	*p* Value
	18-40 years	41-60 years	>60 years		
I	48 (52.7)	34 (37.4)	9 (9.9)	91 (100.0)	<0.001
II	22 (19.3)	67 (58.8)	25 (21.9)	114 (100.0)	
III (a)	17 (12.1)	59 (42.1)	64 (45.7)	140 (100.0)	
III (b)	21 (12.5)	83 (49.4)	64 (38.1)	168 (100.0)	
IV	33 (15.6)	91 (43.1)	87 (41.2)	211 (100.0)	
V	76 (23.2)	152 (46.3)	100 (30.5)	328 (100.0)	
Total	217 (20.6)	486 (46.2)	349 (33.2)	1052 (100.0)	

Table 4: Association of socioeconomic status with stage of CKD.

Stage of CKD	Socio-Economic Status			Total	*p* Value
	Low	Medium	High		
I	26 (8.7)	47 (8.3)	18 (9.6)	91 (8.7)	0.029
II	30 (10.1)	54 (9.5)	30 (16.0)	114 (10.8)	
III (a)	31 (10.4)	75 (13.3)	34 (18.1)	140 (13.3)	
III (b)	42 (14.1)	96 (17.0)	30 (16.0)	168 (16.0)	
IV	62 (20.8)	123 (21.7)	26 (13.8)	211 (20.1)	
V	107 (35.9)	171 (30.2)	50 (26.6)	328 (31.2)	
Total	298 (100.0)	566 (100.0)	188 (100.0)	1052 (100.0)	

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Education level was also associated with stage of CKD (p = 0.035) as educated people referred early {stage I, II, III (a)} as compare to uneducated patients while uneducated patients came late to hospital (stage IV and V) (Table 5).

In our study residence was not associated with the presentation of patients to the hospital (p = 0.25) almost same frequency of rural verses urban were in every stage of CKD (Table 6).

Discussion

This study showed that majority of the patients were referred to a nephrologist when their GFR declined to 30 ml / minute. Among them more than quarter reached at stage V with symptomatic uremia and hemodialysis commended on arrival at emergency department. The factors which were associated with the late referral were male gender, older age, lower socio-economic status and low education level. On the other hand, place of residence either rural or urban did not affect the time of referral.

We found that male patients referred late as compared with female. This is consistent with other studies [14].

Age of the patients also effect the time of referral, as we found older the age of the patient, the more his referral was delayed. This might be due to relatively low serum creatinine despite reduced GFR and wrong perception of relatively better kidney function. This is consistent with the other studies [14,15]. Navaneethan and Nigwekar found that, when age was used as a continuous variable it was not significantly associated with late referral but when they analyzed the population of > 75 years of age this association became significant association 12. Two of the studies one from North America and another from Europe by Arora et al and Wauters et al respectively showed no effect of age on the pattern of referral [16,17].

The socio-economic status of patient also plays important role in diagnosing the disease earlier. The provision of health by state is limited, and only large cities have the tertiary care facilities. Most of the healthcare provision in this country is through the private sector which is accessible to affluent population of the country. Availability of the health insurance is also sparse and available only to those who are associated with corporate setup or multinational companies. This is a reason patient with high socio-economic status diagnosed earlier and seek nephrology consultation earlier then the poor patient.

The effect of socioeconomic status was also observed in areas of greater disadvantage in Australia, although it showed a borderline effect on the pattern of referral in North America [14,18].

Educations play an important role in understanding the disease and seek for the right place of treatment. Majority of patients who present in late stage of CKD were uneducated. There are more trends to pursue for traditional method of treatment, homeopathic or hakims remedies in patient with lower education level. This causes further delay to reach to nephrology care even after earlier diagnosis. Access to internet and electronic media allowed educated patient to look around for the treatment options and most of the educated patients when reached to the nephrology care already known about this disease very well.

Table 5: Association of Education with stage of CKD.

Stage of CKD	Education Cat		Total	*p* Value
	Uneducated	Educated		
I	31 (7.3)	60 (9.5)	91 (8.7)	0.035
II	36 (8.5)	78 (12.4)	114 (10.8)	
III (a)	48 (11.4)	92 (14.6)	140 (13.3)	
III (b)	79 (18.7)	89 (14.1)	168 (16.0)	
IV	94 (22.3)	117 (18.6)	211 (20.1)	
V	134 (31.8)	194 (30.8)	328 (31.2)	
Total	422 (100.0)	630 (100.0)	1052 (100.0)	

Table 6: Association of Residence with stage of CKD.

Stage of CKD	Area of Residence		Total	*p* Value
	Urban	Rural		
I	77 (8.4)	14 (10.1)	91 (8.7)	
II	104 (11.4)	10 (7.2)	114 (10.8)	
III (a)	128 (14.0)	12 (8.6)	140 (13.3)	
III (b)	146 (16.0)	22 (15.8)	168 (16.0)	0.25
IV	178 (19.5)	33 (23.7)	211 (20.1)	
V	280 (30.7)	48 (34.5)	328 (31.2)	
Total	913 (100.0)	139 (100.0)	1052 (100.0)	

Conclusion

We come to know from this study, that in our population CKD patients referred late to nephrology care and the factors which lead to this late referral are increasing age, low socioeconomic status and illiteracy. Therefore, we recommend that patient's awareness should be enhanced by the governmental as well as private health sector levels, so CKD patients can be timely managed and complications can be minimized.

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