Beena Salman¹, Muhammad Tahir², Ruqaya Qureshi¹, Murtaza Fakhruddin Dhrolia¹, Aasim Ahmad¹ and Salman Imtiaz¹*  
¹Department of Nephrology, Dorab Patel Post Graduate Training & Research Center, The Kidney Center Post Graduate Training Institute, 197/9, Rafiqui Shaheed Road, Karachi, Pakistan  
²Department of Pediatrics & Child Health, Aga Khan University, Stadium Road, Karachi, Pakistan  
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*Corresponding author: Salman Imtiaz, The Kidney Centre Postgraduate Training Institute, 179/9, Rafiqui Shaheed Road, Karachi, Pakistan, Tel: +93042007270; 3566-1000; Fax: 3566-1040; 3566-1050; E-mail: salman_imtiaz@hotmail.com  
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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 known in the western population. There is a need to look into the factors in our population.

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 reorganization 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 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 and 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 values 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.

Conclusion

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. KDIGO 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 postgraduate 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 clinics 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).
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 affect 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 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 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) |
| 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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References

1. WHO. Preventing chronic diseases: a vital investment: WHO global report. 2005. Geneva, World Health Organization 35: 1107. Link: https://goo.gl/Q2V5Rz
2. Mills KT, Xu Yu, Zhang W, Bundy JD, Chen CS, et al. (2010) A systematic analysis of worldwide population-based data on global burden of chronic kidney disease in 88. 950-957. Link: https://goo.gl/nXUtxL
3. Kazmi WH, Obrador GT, Khan SS, Pereira BJ, Kausz AT (2004) Late nephrology referral: in influence on mortality and morbidity. Am J Kidney Dis 36: 1808-1814. Link: https://goo.gl/QAtHHg
4. Jungers P, Zingraff J, Albuouze G, Chauveau P, Page B, et al. (1993) Late nephrology referral and mortality among patients with end-stage renal disease: a propensity score analysis. Nephrol Dial Transplantation 19: 1808-1814. Link: https://goo.gl/65P5VZ
5. Roubicek C, Brunet P, Huiart L, Thirion X, Leonetti F, et al. (2000) Timing of nephrology referral: influence on mortality and morbidity. Am J Kidney Dis 36: 35-41. Link: https://goo.gl/M25sDG

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6. McLaughlin K, Manns B, Culleton B, Donaldson C, Taub K. (2001) An economic evaluation of early versus late referral of patients with progressive renal insufficiency. Am J Kidney Dis 38: 1122-1128. Link: https://goo.gl/EBDCAo

7. Baer G, Lameire N, Van Biesen W (2013) Late referral of patients with end-stage renal disease: an in-depth review and suggestions for further actions. NDT plus 3:17-27. Link: https://goo.gl/cUWkJM

8. Chan MR, Dall AT, Fletcher KE, Lu N, Trivedi H (2007) Outcomes in patients with chronic kidney disease referred late to nephrologists: a meta-analysis. Am J Med 120: 1063-1070. Link: https://goo.gl/AwdUZN

9. Smart NA, Titus TT (2011) Outcomes of early versus late nephrology referral in chronic kidney disease: a systematic review. Am J Med. 124: 1073-1080. Link: https://goo.gl/MB2iuU

10. Paul ES, Levin A, (2013) Clinical Guideline for the Evaluation and Management of Chronic Kidney Disease. In KDIGO 2012. Link: https://goo.gl/CB6thh

11. Jones C, Roderic P, Harris S, Rogerson M (2006) Decline in kidney function before and after nephrology referral and effect on survival in moderate to advanced chronic kidney disease. Nephrol Dial Transplantation 21: 2133-2143. Link: https://goo.gl/XvmYy6

12. Navaneethan SD, Kandula P, Jeevanantham V, Nally Jr J, Liebman SE (2010) Referral patterns of primary care physicians for chronic kidney disease in general population and geriatric patients. Clin Nephrol 73: 260-267. Link: https://goo.gl/ozXGah

13. Lee J, Lee JP, An JN, Kim SG, Kim YL, Yang CW (2016) Factors Affecting the Referral Time to Nephrologists in Patients With Chronic Kidney Disease: A Prospective Cohort Study in Korea. Medicine (Baltimore) 95: e3648. Link: https://goo.gl/SQ1lKA

14. Winkelmayer WC, Glynn RJ, Levin R, Owen WF, Avorn J (2001) Determinants of delayed nephrologist referral in patients with chronic kidney disease. Am J Kidney Dis 38: 1178-1184. Link: https://goo.gl/fomjVr

15. Ifudu O, Dawood M, Iofel Y, Valcourt JS, Friedman EA (1999) Delayed referral of black, Hispanic, and older patients with chronic renal failure. Am J Kidney Dis 33: 728-733. Link: https://goo.gl/R3CetE

16. Arora P, Obrador GT, Ruthazer R, Kausz AT, Meyer KB, et al. (1999) Prevalence, predictors, and consequences of late nephrology referral at a tertiary care center. J Am Soc Nephrol 10: 1281-1286. Link: https://goo.gl/rCE6tn

17. Wauters JP, Bosson JL, Forneris G, Turc-Baron C, Golshayan D, et al. (2004) Patient referral is influenced by the dialysis center structure in the Diamant Alpin Dialysis cohort study. Nephrol Dial Transplant 19: 2341-2346. Link: https://goo.gl/mhus9Q

18. Cass A, Cunningham J, Snelling P, Wang Z, Hoy W (2003) Urban disadvantage and delayed nephrology referral in Australia. Health Place 9: 175-182. Link: https://goo.gl/6HVkbT