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Original Article

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Factors Affecting Registration on Kidney Transplant Waiting List

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Abstract

Objective: This study aimed to determine the rate of registration on a kidney transplant waiting list and to investigate related factors in our geographical region.
Materials and Methods: We conducted this study with 355 prevalent adult patients undergoing hemodialysis in Turkey. We used a survey to inquire whether the patients have registered on a kidney transplant waiting list.
Results: A total of 93 (26.2%) patients were registered on a kidney transplant waiting list. Patients registered on the waiting list were younger, had a higher education level, had been receiving hemodialysis for a longer time, and were mostly male. Patients with cardiovascular disease, diabetes mellitus, or chronic obstructive pulmonary were less likely to register. Patients with higher numbers of comorbid conditions registered less frequently. Independent variables were age, education, presence of cardiovascular disease, and the number of comorbid conditions. Of the registered patients, 40.9% did not visit the transplantation center for reevaluation in the previous year. When we asked non-registered patients the reason for not registering, the most common answers were they were old (52.7%) and that they were not eligible for transplantation (11.1%).
Conclusion: Younger, well-educated patients with less comorbidity register more frequently. A substantial proportion of the patients do not go for reevaluation after registration.
Keywords: End-stage renal disease, hemodialysis, kidney transplant waiting list, Turkey

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INTRODUCTION

The prevalence of patients with end-stage renal disease (ESRD) is gradually increasing (1). These patients have a higher mortality rate compared to the general population (2). Long-term survival was found to be increased in patients who were the recipients of kidney transplant compared to patients undergoing dialysis and those on a kidney transplant waiting list (3). Quality of life was shown to be increased in patients with kidney transplant as compared to patients undergoing dialysis (4, 5). In Turkey, 77% of the kidney transplants performed in 2016 were obtained from a living donor. Kidney transplantation from a deceased donor has been another option for patients for whom a living donor is not available (1).

The patients with ESRD need to be registered on a kidney transplant waiting list to receive a transplant from a deceased donor. Patients are examined for eligibility for transplantation both physically and psychologically before being approved to register the waiting list. Eligible patients for kidney transplantation are registered on the kidney transplant waiting list (6). There are differences among transplantation centers and among countries in terms of patient evaluation and eligibility criteria during registration on the waiting list. Some patients with ESRD are considered ineligible by transplantation centers to be registered on the waiting list (7, 8). Some patients, however, never visit a transplantation center for registration (9).

Studies that investigate factors affecting registration of patients with ESRD on a kidney transplant waiting list found varying results. Age, gender, race, socioeconomic status, distance of transplantation center, and presence of comorbid conditions such as cardiovascular disease (CVD), diabetes mellitus (DM), or malignancy may influence registration (10-15). The rate of registration on a kidney transplant waiting list shows variation among countries, even among the regions of the same country (14-16). It may show variations among dialysis centers as well (13, 17).

Factors that affect the registration on a kidney transplant waiting list and the rate of registration vary among countries and regions. This study aimed to determine the rate of registration on a kidney transplant waiting list at the hemodialysis centers located in our geographical region in Turkey and to investigate the related factors.

MATERIALS AND METHODS

Study Population

We carried out this study in January 2018 in five hemodialysis centers from four different cities of the Central Black Sea and Central Anatolia regions in Turkey. All patients in each of the hemodialysis centers were enrolled into the study. Patients from regions, other than those listed who had been receiving hemodialysis temporarily in our study centers, were excluded from this study. A total of 355 prevalent adult patients undergoing hemodialysis were included in the study. All patients were aged above 18 years. Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013). Informed consent form received from the patients who participated in this study.

Data Collection

We recorded patients' age, gender, education status, and duration of hemodialysis therapy. The patients were asked whether they have DM [receiving oral antidiabetic and/or insulin], hypertension [receiving antihypertensive drugs either occasionally or regularly], CVD [coronary artery disease (CAD), congestive heart failure, cardiac valve replacement, pacemaker, peripheral vascular disease, and cerebrovascular disease], chronic obstructive pulmonary disease (COPD), dementia, history of malignancy, and history of kidney transplantation. The patients were also asked whether they have been registered on a kidney transplant waiting list as well as the date of registration and the date they have last visited the transplantation center for reevaluation in case they have been registered and, if they were not registered, the reasons for it. Data were collected by a questionnaire completed via face-to-face interview. If the patient had dementia, the interview was performed in the presence of caregiver. The age of each patient, date of starting hemodialysis therapy, comorbidities, and transplant waiting list status were checked from each patient's hemodialysis records.

Statistical Analysis

Suitability of variables for normal distribution was analyzed by the Kolmogorov-Smirnov test. Median and interquartile range (25%-75%) were used for variables not distributed normally. Categorical variables were expressed as frequencies and percentages. Duration of hemodialysis was compared between the groups using the Mann-Whitney U test as it was not distributed normally. The relationship between registration on a kidney transplant waiting list and categorical variables was analyzed by the Chi-square test or Fisher's exact test. Multivariate analysis was performed with the significant factors determined by univariate analyses. Independent factors that affect waiting list registration were identified by multivariate logistic regression analysis. A $p<0.05$ was considered statistically significant.

RESULTS

The study was conducted with 355 patients undergoing hemodialysis, of whom 173 (48.7%) were female and 182 (51.3%) were male. Ninety-three (26.2%) patients had registered on the kidney transplant waiting list. The rates of registration on the waiting list in five different dialysis centers were 22.9%, 23.6%, 26.3%, 26.5%, and 29.4%. There was no significant difference between the dialysis centers in terms of rate of waiting list registration ($p=0.944$).

Patients registered on the waiting list were younger, had a higher education level, and had been receiving hemodialysis for a longer time compared to the patients who were not registered. The percentage of registration was higher for male patients (Table 1). With regard to the comorbid conditions, patients with CVD, DM, and COPD were less likely to register, whereas the presence of hypertension had no impact on registration. Patients with higher number of comorbid conditions registered less frequently (Table 2). Multivariate logistic regression analysis revealed the age, education level, type of vascular access, presence of CVD, and total number of comorbid conditions as the independent variables (Table 3).

Fifty-five (59.1%) registered patients have visited a transplantation center in the previous year for either registration or reevaluation (Table 4).

When the 262 patients who had not been registered on the waiting list were asked "Why have you not been registered on the kidney transplant waiting list?", they most frequently answered "I am old, I don't want a kidney transplant" (52.7%). These patients had never visited a transplantation center for registration on the waiting list. The second most common answer was "I was informed that I was not eligible for kidney transplantation" (11.1%) (Table 5).

Table 1. Patients' characteristics associated with registration on the waiting list

Patients' characteristics	Registered patients (n=93)	Non-registered patients (n=262)	p
Age (years)			
18-49	21 (22.6%)	19 (7.3%)	<0.0001
50-64	54 (58.1%)	82 (31.3%)	
≥65	18 (19.4%)	161 (61.5%)	
Gender			
Female	37 (39.8%)	136 (51.9%)	0.044
Male	56 (60.2%)	126 (48.1%)	
Duration of hemodialysis (months)	64 (35-101)	41 (17-92)	0.004
Education			
Illiterate or literate	11 (11.8%)	107 (40.8%)	<0.0001
Primary or middle school graduate	65 (69.9%)	137 (52.3%)	
High school or university graduate	17 (18.3%)	18 (6.9%)	
Dialysis access			
Arteriovenous fistula	88 (94.6%)	206 (78.6%)	<0.0001
Catheter	5 (5.4%)	56 (21.4%)	
Distance to transplant center			
<100 km	72 (77.4%)	193 (73.7%)	0.475
>100 km	21 (22.6%)	69 (26.3%)	

Data are expressed as median (interquartile range 25%-75%), number (percentage)

Table 2. Comorbid conditions associated with registration on the waiting list

Comorbid conditions	Registered patients (n=93)	Non-registered patients (n=262)	p
Cardiovascular disease	22 (23.7%)	135 (51.5%)	<0.0001
Diabetes mellitus	18 (19.4%)	103 (39.3%)	<0.0001
Hypertension	51 (54.8%)	172 (65.6%)	0.064
Chronic obstructive pulmonary disease	2 (2.2%)	22 (8.4%)	0.039
History of malignancy	1 (1.1%)	10 (3.8%)	0.30
Dementia	0 (0%)	3 (1.1%)	0.57
Prior kidney transplantation	2 (2.2%)	6 (2.3%)	1.0
Total comorbid conditions			
0-2	87 (93.5%)	191 (73%)	<0.0001
≥3	6 (6.5%)	71 (27%)	

Table 3. Patients' factors associated with registration on the waiting list (multivariate logistic regression analysis)

Characteristics	Odds ratio	95% CI	p
Age (years)			
≥65	1		
50-64	4.23	1.72-10.42	0.002
18-49	4.44	2.27-8.67	<0.0001
Education			
Illiterate or literate	1		
Primary or middle school graduate	2.16	0.92-5.01	0.07
High school or university graduate	3.46	1.13-10.59	0.03
Dialysis access			
Catheter	1		
Arteriovenous fistula	4.17	1.49-11.62	0.006
Cardiovascular disease			
Present	1		
Absent	2.59	1.39-4.82	0.003
Total comorbid conditions			
≥3	1		
0-2	4.98	1.96-12.58	0.001

DISCUSSION

In this study, 26.2% of the patients with ESRD had registered for the kidney transplant waiting list. The percentage of patients with ESRD registered shows substantial differences among countries. In a study, it was found to range from 10% to 55% (14). In a study from Scotland, 38.4% of the patients who started receiving renal replacement therapy (RRT) (hemodialysis and peritoneal dialysis) had been registered on the waiting list (10). Another study from France determined 24.7% of those starting RRT had been registered (11). In a study conducted in 41 dialysis units from England and Wales, it was determined that 23.3% of the patients were on active kidney transplant waiting list (17). In Brazil, 29% of the patients receiving RRT had been registered on the transplant waiting list (18) In Saudi Arabia, only, 14% of patients with ESRD were on the active waiting list (19). Different from the other countries, there were no patients undergoing peritoneal dialysis in this study. We can say that this study is

Table 4. The last visit to a transplantation center (for registration or reevaluation)

	Registered patients (n=93) (100%)
≤12 months ago	55 (59.1%)
13-24 months ago	16 (17.2%)
25-60 months ago	17 (18.3%)
>60 months ago	5 (5.4%)

Table 5. Responses of the non-registered patients to the question of "Why have you not been registered on the kidney transplant waiting list?"

Patients' responses	**Non-registered patients (n=262) (100%)**
I am old, I don't want a kidney transplant	138 (52.7%)
I was informed that I was not eligible for kidney transplantation	29 (11.1%)
No cause, I don't want a kidney transplant	25 (9.5%)
I did not register, but I will apply to register	23 (8.8%)
I have important health problems	16 (6.1%)
Evaluation process for kidney transplantation took too long, so I gave up	8 (3.1%)
I want a kidney transplant from a living donor	7 (2.7%)
I don't want a kidney transplant again (these patients had a previous kidney transplant that resulted in rejection)	5 (1.9%)
I'm old. My children aren't interested in me. I can't go to a transplantation center	4 (1.5%)
I don't want to deal with the evaluation process for kidney transplantation.	3 (1.1%)
I think kidney transplantation waiting time for a kidney from a deceased donor is too long	2 (0.8%)
The transplant center is far away	2 (0.8%)

comparable with the studies from other countries in terms of the percentage of patients registered on the waiting list.

We determined that elderly patients are less likely to be registered; the rate of registration on the waiting list was significantly lower among patients over 65 years old. This might be because of an increased number of comorbid conditions (20), decreased mobility (21), and increased reluctance to undergo transplantation with aging in patients undergoing dialysis (19). The majority of elderly patients have not even visited a transplantation center to be registered. The most common answer given to the question "Why have you not been registered on the kidney transplant waiting list?" was "I am old so I do not want to undergo kidney transplantation". Studies from different countries revealed similar outcomes; elderly patients less often registered on the waiting list (10-15, 17).

Presence of comorbid conditions also affects the registration. Studies have revealed different outcomes concerning the comorbid conditions that affect undergoing kidney transplantation. Stel et al. determined that DM, CVD, and malignancy among comorbid conditions reduce the patient's probability of undergoing transplantation. Moreover, patients with a higher number of comorbid conditions are less likely to undergo transplantation (20). In two different studies from France, the percentage of registration on kidney transplant waiting list was lower among patients with DM, CVD, history of malignancy, and psychiatric disorder (11, 15). A few studies demonstrate that DM does not affect kidney transplantation (14). In this study, patients with DM or COPD have been registered on the waiting list less frequently. However, these disorders were not found to be the independent variables affecting registration. In this study, a history of malignancy or dementia had no impact on registration on the waiting list. This reason might have resulted from a limited number of study patients with a history of malignancy or dementia.

In this study, presence of CVD was an independent variable affecting registration. Incidence of CVD increases with age in patients with ESRD (20). Presence of CVD in patients undergoing dialysis enhances the risk of cardiac complication both in the perioperative period and in the long-term following kidney transplantation, and it results in increased mortality (22, 23). CVD together with infection is the most common cause of death with functioning graft in the long term after kidney transplantation (24). Therefore, cardiac evaluation is recommended before transplantation, particularly in the symptomatic patients with a high risk of CVD (6, 25). In this study, patients with CVD were registered less frequently. Patients with CVD might have been considered "high-risk" during pretransplantation evaluation and excluded from the waiting list (25). Additionally, the patient may have not applied for registration on waiting list because of heart disease. Other studies have revealed CVD affects transplant waiting list registration (11, 14, 15, 26).

Patients with hemodialysis catheters were registered less frequently. The number of the patients using a catheter increases with aging, peripheral vascular disease, and presence of DM (27). In this study, the number of elderly patients and those with CVD was low on the waiting list. This might have resulted in a lower number of patients with catheter on the waiting list.

Of the registered patients, 40.9% did not visit the transplantation center for reevaluation in the last year. The waiting period for the patients on the kidney transplant waiting list may be prolonged. Transplant candidates should be periodically evaluated because the morbidity of patients undergoing dialysis is high. The frequency of reevaluation and the tests to be performed depend on the comorbid conditions of the patients.

Especially cardiovascular reevaluation is very important in follow-up visits (28). The patients with ESRD are at increased risk for CVD. This CVD risk may progress in time. Nevertheless, patients may remain asymptomatic despite worsened CVD (29). Valvular calcification, aortic stenosis in particular, may rapidly progress in patients undergoing hemodialysis, and the prognosis is poor (30). Therefore, patients need to be evaluated at certain intervals. Yearly evaluation is recommended particularly for high-risk patients (29). Kidney Disease Outcomes Quality Initiative (K/DOQI), Clinical Practice Guidelines for Cardiovascular Disease in Dialysis Patients recommends annual evaluation for CAD for patients with diabetes on the kidney transplant waiting list. Annual evaluation is also recommended for patients on the waiting list who have a history of CAD, percutaneous transluminal coronary angioplasty, or coronary stent. If an asymptomatic patient undergoing dialysis has moderate or severe aortic stenosis, yearly evaluation via Doppler echocardiogram is recommended (31). In addition to CVD, reevaluation may be needed also to detect malignancy or other comorbidities (28). Patients who have contraindications for kidney transplantation should be removed from the waiting list (28). These suggest reevaluation is necessary for patients registered on the waiting list.

When the patients who were not registered were asked about the reason for not getting registered, the most frequent answer was that they are too old. The study conducted in Saudi Arabia reported similar outcomes (19). Another study also found that willingness to undergo transplantation decreases with age (32). In this study, being informed they are not eligible for transplantation was the second most frequent answer given by the patients who were not on the waiting list. These patients might have not been registered on the waiting list because of the presence of CVD or other comorbid conditions.

CONCLUSION

The most significant factors that affect patients' registration on the kidney transplant waiting list were age, education, presence of CVD, and the number of comorbid conditions. Younger, well-educated patients with less comorbidity are registered more frequently. A substantial proportion of patients do not visit the transplantation center for reevaluation after they have been registered. Being old is the leading reason given by patients who do not want to register on the waiting list.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Informed consent form received from the patients who participated in this study.

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REFERENCES

1. Seyahi N, Ates K, Suleymanlar G. Current Status of Renal Replacement Therapies in Turkey: Summary of Turkish Society of Nephrology Registry 2016 Report. Turk Neph Dial Transpl 2018; 27: 133-9.
2. de Jager DJ, Grootendorst DC, Jager KJ, van Dijk PC, Tomas LM, Ansell D, et al. Cardiovascular and noncardiovascular mortality among patients starting dialysis. JAMA 2009; 302: 1782-9. [CrossRef]
3. Wolfe RA, Ashby VB, Milford EL, Ojo AO, Ettenger RE, Agodoa LY, et al. Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of a first cadaveric transplant. N Engl J Med 1999; 341: 1725-30. [CrossRef]
4. Maglakelidze N, Pantsulaia T, Tchokhonelidze I, Managadze L, Chkhotua A. Assessment of health-related quality of life in renal transplant recipients and dialysis patients. Transplant Proc 2011; 43: 376-9. [CrossRef]
5. Ataş DB, Arıkan H, Ecder SA, Çiftçi H. Comparison of Anxiety, Depression and the Quality of Life Between Hemodialysis and Renal Transplantation Patients. Turk Neph Dial Transpl 2017; 26: 171-6.
6. European Renal Best Practice Transplantation Guideline Development Group: ERBP Guideline on the Management and Evaluation of the Kidney Donor and Recipient. Nephrol Dial Transplant 2013; Suppl 2: 1-71. [CrossRef]
7. Fritsche L, Vanrenterghem Y, Nordal KP, Grinyo JM, Moreso F, Budde K, et al. Practice variations in the evaluation of adult candidates for cadaveric kidney transplantation: a survey of the European Transplant Centers. Transplantation 2000; 70: 1492-7. [CrossRef]
8. Ramos EL, Kasiske BL, Alexander SR, Danovitch GM, Harmon WE, Kahana L, et al. The evaluation of candidates for renal transplantation. The current practice of U.S. transplant centers. Transplantation 1994; 57: 490-7. [CrossRef]
9. Alexander GC, Sehgal AR. Why hemodialysis patients fail to complete the transplantation process. Am J Kidney Dis 2001; 37: 321-8. [CrossRef]
10. Oniscu GC, Schalkwijk AA, Johnson RJ, Brown H, Forsythe JL. Equity of access to renal transplant waiting list and renal transplantation in Scotland: cohort study. BMJ 2003; 327: 1261. [CrossRef]
11. Bayat S, Frimat L, Thilly N, Loos C, Briançon S, Kessler M. Medical and non-medical determinants of access to renal transplant waiting list in a French community-based network of care. Nephrol Dial Transplant 2006; 21: 2900-7. [CrossRef]
12. Schold JD, Gregg JA, Harman JS, Hall AG, Patton PR, Meier-Kriesche HU. Barriers to evaluation and wait listing for kidney transplantation. Clin J Am Soc Nephrol 2011; 6: 1760-7. [CrossRef]
13. Pruthi R, Curnow E, Roderick P, Ravanan R. UK Renal Registry 17th Annual Report: Chapter 11 Centre Variation in Access to Renal Transplantation in the UK (2008-2010). Nephron 2015; 129 Suppl 1: 247-56. [CrossRef]

14. Satayathum S, Pisoni RL, McCullough KP, Merion RM, Wikström B, Levin N, et al. Kidney transplantation and wait-listing rates from the international Dialysis Outcomes and Practice Patterns Study (DOPPS). Kidney Int 2005; 68: 330-7. [CrossRef]
15. Bayat S, Macher MA, Couchoud C, Bayer F, Lassalle M, Villar E, et al. Individual and regional factors of access to the renal transplant waiting list in France in a cohort of dialyzed patients. Am J Transplant 2015; 15: 1050-60. [CrossRef]
16. Ashby VB, Kalbfleisch JD, Wolfe RA, Lin MJ, Port FK, Leichtman AB. Geographic variability in access to primary kidney transplantation in the United States, 1996-2005. Am J Transplant 2007; 7: 1412-23. [CrossRef]
17. Dudley CR, Johnson RJ, Thomas HL, Ravanan R, Ansell D. Factors that influence access to the national renal transplant waiting list. Transplantation 2009; 88: 96-102. [CrossRef]
18. Sesso RC, Lopes AA, Thomé FS, Lugon JR, Martins CT. Brazilian Chronic Dialysis Census 2014. J Bras Nefrol 2016; 38: 54-61. [CrossRef]
19. Alansari H, Almalki A, Sadagah L, Alharthi M. Hemodialysis Patients' Willingness to Undergo Kidney Transplantation: An Observational Study. Transplant Proc 2017; 49: 2025-30. [CrossRef]
20. Stel VS, van Dijk PC, van Manen JG, Dekker FW, Ansell D, Conte F, et al. Prevalence of co-morbidity in different European RRT populations and its effect on access to renal transplantation. Nephrol Dial Transplant 2005; 20: 2803-11. [CrossRef]
21. Duman D, Erdem E, Ecder T. Evaluation of Physical Activity with a Pedometer in Hemodialysis Patients. Turk Neph Dial Transpl 2018; 27: 173-7.
22. Humar A, Kerr SR, Ramcharan T, Gillingham KJ, Matas AJ. Peri-operative cardiac morbidity in kidney transplant recipients: incidence and risk factors. Clin Transplant 2001; 15: 154-8. [CrossRef]
23. Lentine KL, Brennan DC, Schnitzler MA. Incidence and predictors of myocardial infarction after kidney transplantation. J Am Soc Nephrol 2005; 16: 496-506. [CrossRef]
24. Morales JM, Marcén R, del Castillo D, Andres A, Gonzalez-Molina M, Oppenheimer F, et al. Risk factors for graft loss and mortality after renal transplantation according to recipient age: a prospective multicentre study. Nephrol Dial Transplant 2012; 27 Suppl 4: 39-46. [CrossRef]
25. Dudley C, Harden P. Renal Association Clinical Practice Guideline on the assessment of the potential kidney transplant recipient. Nephron Clin Pract 2011; 118 Suppl 1: 209-24. [CrossRef]
26. Schold JD, Srinivas TR, Kayler LK, Meier-Kriesche HU. The overlapping risk profile between dialysis patients listed and not listed for renal transplantation. Am J Transplant 2008; 8: 58-68.
27. Pisoni RL, Young EW, Dykstra DM, Greenwood RN, Hecking E, Gillespie B, et al. Vascular access use in Europe and the United States: results from the DOPPS. Kidney Int 2002; 61: 305-16. [CrossRef]
28. Bunnapradist S, Danovitch GM. Evaluation of adult kidney transplant candidates. Am J Kidney Dis 2007; 50: 890-8. [CrossRef]
29. Danovitch GM, Hariharan S, Pirsch JD, Rush D, Roth D, Ramos E, et al. Management of the waiting list for cadaveric kidney transplants: report of a survey and recommendations by the Clinical Practice Guidelines Committee of the American Society of Transplantation. J Am Soc Nephrol 2002; 13: 528-35.
30. Malergue MC, Urena P, Prieur P, Guédon-Rapoud C, Pétrover M. Incidence and development of aortic stenosis in chronic hemodialysis. An ultrasonographic and biological study of 112 patients. Arch Mal Coeur Vaiss 1997; 90: 1595-601.
31. K/DOQI Workgroup. K/DOQI Clinical Practice Guidelines for Cardiovascular Disease in Dialysis Patients. Am J Kidney Dis 2005; 45: 1-153. [CrossRef]
32. Tan Q, Song T, Jiang Y, Qiu Y, Liu J, Huang Z, et al. Factors affecting willingness to receive a kidney transplant among hemodialysis patients in West China: A cross-sectional survey. Medicine (Baltimore) 2017; 96: e6722. [CrossRef]