

Comparison of Graft Survival in Kidney Transplant Recipients Over 50 Years and Under 50 Years in Tabriz Imam Reza Hospital

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Abstract

Introduction

Chronic kidney failure is one of the most common diseases in the world. The prevalence and incidence of end-stage renal disease are increasing in developed and developing countries, bringing a tremendous financial burden to healthcare systems. Therefore, according to the above, this study aims to compare graft survival in kidney transplant recipients over 50 years old and under 50 years old in Imam Reza Hospital, Tabriz, Iran.

Methods

Following approval from the Regional Research Ethics Committee, a retrospective study was conducted on all patients admitted to Imam Reza Hospital in Tabriz in 2020 who underwent kidney transplantation.

Results

This study included 74 patients, of which 50 (67.6%) were male, and 24 (32.4%) were female. The mean age of the transplant recipients was 40.91 ± 14.20 , with 47 (63.5%) being under 50 years of age and 27 (36.5%) aged 50 or above. Of these patients, 8 (10.8%) were deceased, and 66 (89.2%) were living cases. The left kidney was transplanted in 67 (90.5%) and the right kidney in 7 (9.5%). The mean age of the deceased patients (8 patients) was 53.37 ± 9.73 , while the mean age of the living patients (66 patients) was 39.40 ± 13.96 , resulting in a statistically significant difference ($p < 0.01$). Additionally, 6 (22.2%) of the patients aged 50 and above who underwent transplantation died, compared to 4.3% in the patients aged under 50 (2 patients); this was also statistically significant ($p = 0.01$).

Conclusion

The results of the study, which involved 74 patients, revealed that there was no significant difference in gender and side of the transplanted kidney between the two groups; however, age was found to be an important factor in patient survival.

Keywords: kidney transplant, transplant rejection, end-stage renal disease.

Introduction

Chronic kidney disease (CKD) is a global health burden that causes high financial expenses to world health systems and is related to expanded risks of cardiovascular mortality and diminished quality of life [1]. The prevalence of CKD is escalating in developed and developing countries, with Iran being one of the most affected nations [2]. This medical condition has become a prominent issue in societies with high health indexes due to increased life expectancy [2]. It is thought that the elevation in the prevalence of End-Stage Renal Disease (ESRD) patients is probably due to diabetes mellitus and hypertension; however, the precise causes remain unknown [3, 4]. Hemodialysis, peritoneal dialysis, and kidney transplantation are treatment approaches for ESRD patients. Kidney transplantation is the most effective and affordable option, enhancing the patient's quality of life and reducing mortality, though certain restrictions exist [5,6,7]. The prevalence of ESRD, since the aging of the global population, has grown, resulting in a greater demand for kidney transplants. Despite this, there remain limited resources for transplantation [8]. Therefore, improving the necessary conditions to increase the probability of kidney transplant success is essential. Although the considerable improvement kidney transplantation can provide in the physical and mental of the patients, the host's immune response can reject the transplanted kidney, which can necessitate a second transplant or even cause death or other side effects. Kidney transplant failure is a complex process that can be influenced by a variety of factors, with the age of the transplant recipient being one of the most powerful [9]. The allograft rejection of a transplanted kidney happens when tissues or cells from the donor cause an immune response from recipient against the transplanted tissue. Since the donor kidney will act as an alloantigen, several factors must be considered to match it to the recipient. The inflammatory response and pathological changes when the allograft rejects are due to the immune system's recognition of the non-self-antigen receptor on the allograft, which can cause allograft dysfunction. The innate and specific immune systems play essential roles in transplant rejection; however, T lymphocytes are the primary cells that recognize the allografts [10]. Cytokines also play a significant role in this reaction [11]. The study of Sellers et al. [12] showed that many failures exhibited phenotypic characteristics of antibody- or combination-induced rejection. Consequently, it is essential to study predictors of the survival of transplanted kidneys and the factors that influence such survival [5, 13]. This study aimed to investigate the effect of age on patient survival after kidney transplantation in patients who underwent transplantation.

Material and Methods

Study population

This study was a retrospective cross-sectional study in which conducted by examining the medical records of patients who had undergone kidney transplantation at Tabriz Imam Reza Hospital between March 2020 and March 2021. The protocol of the study was approved by the ethical committee of Tabriz of Medical sciences (IR.TBZMED.REC.1400.1204).

Inclusion and exclusion criteria

Inclusion criteria were patients aged 18 and over, patients with ESRD, and who had undergone kidney transplantation. Exclusion criteria were patients under 18 years old and transplant rejection before hospital discharge.

Evaluation

Inclusion criteria were patients aged 18 and over with ESRD and who had undergone kidney transplantation. Exclusion criteria were patients lower than 18 years old aged transplant rejection before hospital discharge.

Statistical analysis

Statistical analysis was performed using SPSS Statistics software for Windows, version 20. Descriptive statistics were utilized to present patient demographic data, and results were reported as numbers, frequencies, and means \pm standard errors. Quantitative results were compared using the Mann-Whitney U test, and qualitative results were evaluated using a chi-squared test. Pearson's and Spearman's correlation tests were employed to analyze parametric and non-parametric data, respectively. A p-value of less than 0.05 determined statistical significance.

Results

During the 1-year study period, 74 patients undergoing kidney transplantation in Imam Reza Hospital of Tabriz from March 2020 and March 2021 were examined. There was no kinship between kidney donors and recipients. Besides, 67.6 percent of the patients were male, and 32.4 percent were female. There was no significant difference between the two groups regarding gender or side of the transplanted kidney (Table 1,2). Considering the age of patients, the average ages of kidney transplant recipients were 40.91 ± 14.20 years ranging from 18 to 69 years. 63.5 percent of the patients were under 50 years old, and 36.5 percent were over 50 years old (Table 1). The analysis of recipients' age revealed that higher donors (p-value < 0.05) significantly contributed to the survival rate (Table 1,2). The survival rate of the transplant recipients was 89.2%, with 8 (10.8%) mortality cases documented. Most transplants were of the left kidney (90.5%), while 9.5% were of the right. The mean age of the deceased patient group, which comprised eight patients, was 53.37 ± 9.73 , while the mean age of the living patient group (which included 66 patients) was 39.40 ± 13.96 ; a statistically significant difference ($P < 0.05$) (Table 2). Additionally, six patients (22.2%) aged 50 or more years who underwent transplantation passed away, compared to only 2 out of 47 patients in the age group under 50 years, equating to 4.3%. This suggests a statistically significant difference ($P < 0.05$). Among the comorbidities, diabetes was present in 36.5% (27 patients). Six patients (22.2%) with diabetes who underwent transplantation died, compared to only two out of 47 patients in the other group. The study's results demonstrated a statistically significant difference in the age distribution of the two groups ($p < 0.05$). The oldest patient in the study was in the deceased group, whereas the youngest patient was in the healthy group (Figure 1,2).

Feature	Age group		The side of the transplanted kidney		Outcome		Type of transplanted kidney	
	< 50 years	≥ 50 years	Right	Left	Dead	Alive	Deceased	Alive
Count (%)	47 (%63.5)	27 (%36.5)	7 (%9.5)	67 (%90.5)	8 (%10.8)	66 (%89.2)	11 (%14.9)	63 (%85.1)

Table 1: Demographic information

		Dead group	Alive group	P-Value
Gender	Male	4 (%8)	46 (%92)	(P>0.05)
	Female	4 (%16.7)	20 (%83.3)	
Age group	< 50 years	2 (%4.3)	45 (%95.7)	(P<0.05) *
	≥ 50 years	6 (%22.2)	21 (%77.8)	
Side of the transplanted kidney	Right	1 (%14.3)	6 (%85.7)	(P>0.05)
	Left	7 (%10.4)	60 (%89.6)	
Mean age		53.37 ± 9.73	39.40 ± 13.96	(P<0.05) *
Duration of dialysis before transplantation	< 1 year	3 (%4.9)	58 (%95.1)	(P>0.05)
	> 1 year	5 (%38)	8 (%62)	
Comorbidity (Diabetes)	Yes	6 (%22.22)	21 (%77.78)	(P>0.05)
	No	2 (%4.3)	45 (%95.7)	

Table 2: Comparison of dead and alive

Discussion

Living kidney donation has always been associated with risks; the primary goal of donor evaluation and selection is to minimize the short- and long-term side effects after donation and to ensure that the risks are acceptable to both the donor and the recipient. The decision to accept or reject a living kidney donor candidate is limited by the lack of evidence-based tools to provide quantitative and individualized estimates of the post-donation risk [14]. A significant advancement is the quantification of the combined effect of all demographic characteristics (such as age, gender, and race) and health of a candidate donor on the risk of serious adverse events after donation at the time of assessment (such as kidney function, blood pressure, and body mass index). Severe adverse reactions after donation may be related to the medical or psychosocial surgical procedure. They may occur during the peri nephrectomy period, a fixed long-term follow-up period (e.g., 15 years after donation), or for the remainder of the donor's life [15].

Our study showed no significant difference between men and women in survival after receiving a kidney transplant. Additionally, according to our results, age was an important factor in patient survival. The study of Jacob et al. [16] and Wafa et al. [17] did not show a significant difference in short-term or long-term transplant survival rates between male and female transplant recipients or between transplant recipients who were the same sex as the donor and those of the opposite sex. Additionally, these two studies found no significant difference in transplant survival between women who received transplants from male and female donors. The survey of Bellini et al. [18] showed that male recipients who received a transplant from a male donor were 65% less likely to lose the transplant than male recipients who received a transplant from a female donor after three years of follow-up. No significant

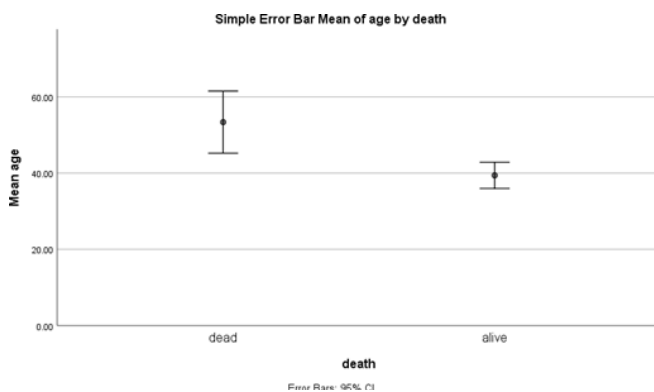


Figure 1: Comparison of the average age of dead and alive patients

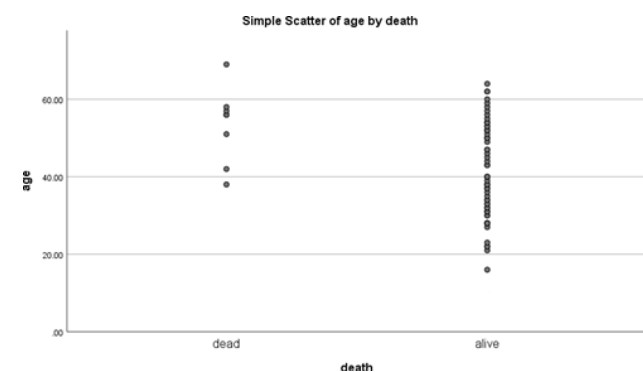


Figure 2: Comparison of age distribution of 2 study groups based on patient mortality

difference was reported in graft survival in female recipients, regardless of their donors.

Our study showed no significant difference in transplant recipient survival between these two groups. Living kidney donation was introduced as the optimal treatment for kidney failure. In contrast, the study of Bellini et al. [19] and Kerr KF et al. [20] on deceased donation indicated that the type of donor's kidney had a mild to moderate impact on clinical outcomes after transplantation.

Conclusion

This study was conducted to identify the effect of age on survival after kidney transplantation in transplant patients at Imam Reza Hospital in Tabriz, Iran. This study showed that age is a significant factor in patient survival, while there was no significant difference in gender and side of transplanted kidneys between the two groups.

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Disclosure of conflict of interest

All of the authors declare that there are no potential conflicts of interest.

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