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Comparison of Outcomes of Kidney Transplantation in Diabetic and Non-Diabetic Patients

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ABSTRACT

When opposed to long-lasting dialysis, kidney transplantation offers patients with end-stage renal illness a higher chance of mortality and a better standard of life. It is still up for debate whether kidney transplantation is more beneficial for diabetic individuals in contrast to those lacking the disease. **Objective:** To compare outcomes of kidney transplantation in diabetic and non-diabetic patients. **Methods:** Data from 100 patients was collected from Sheikh Zayed Hospital Lahore, Pakistan.The following variables were assessed to compare the consequences of transplants in patients with and without diabetes: per graft fluid collection, superficial infection of the wounded area, cut-off hernia, shallow injury dehiscence, cellulitis, seroma, fascial breaking down, deep wound contamination, hypertension, and mortality and recuperation. Fisher's exact test was applied to test statistically significant variances in outcomes and p-value≤0.05 was considered significant. **Results:** A statistically significant variance was observed in per graft fluid collection among diabetic and non-diabetic kidney transplant patients i.e., 68% vs 32% respectively with p-value≤0.05. A significant difference was observed in the occurrence of incisional hernias between the two groups, with a high rate in non-diabetic patients. Facial dehiscence also showed a statistically significant difference, with a higher incidence in non-diabetic patients (p=0.010). **Conclusions:** It was concluded that diabetes significantly impacts certain post-transplant outcomes, such as fluid collection. In contrast, other outcomes like incisional hernia and facial dehiscence are more prevalent in non-diabetic patients who had kidney transplants.

INTRODUCTION

When contrasted with long-lasting dialysis, kidney transplantation offers those suffering from end-stage renal disease (ESRD) a better standard of life and a higher chance of survival, perhaps saving their lives [1, 2]. However, there are several inconsistencies in earlier research, such as the fact that adherence to glycemic objectives was not taken into account and that diabetes therapy administered over time changed [3]. Because of the tiny sample size, our estimations are not as precise as possible. The regression models did not account for the incidence of medicated acute rejection or the Kidney Donor Profile Index. However, the success of a kidney transplant can be influenced by various factors, including the recipient's underlying health conditions [4]. Diabetes mellitus (DM), a leading cause of ESRD, is particularly significant due to its pervasive effects on multiple organ systems, including the cardiovascular system, immune function, and wound healing [5, 6]. All but one study had a larger proportion of male respondents than female ones [7]. From Saudi Arabia to Australia, studies were carried out all over the world, although most came from China (n=6) and Poland (n=3). Diabetes was the condition most often evaluated result (n=14) [8]. According to estimates, the prevalence of diabetes in all age categories was 2.8% worldwide in 2000 and is expected to increase to 4.4% by 2030 [9]. According to a 2006 research by the WHO

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Collaborating Center for Diabetes and the Diabetic Association of Pakistan, the incidence of Type II diabetes was 2.5% in rural women and 6.9% in men, whereas it was 3.5% in women and 6.0% in men living in cities [10]. According to these standards, the incidence of diabetes worldwide was 8.8% (95% CI 7.2–11.3%) in 2017 (standardized for the 20–79 age range), and by 2045, it is predicted to rise to 9.9% (95% CI 7.5–12.7%). The incidence of diabetes has steadily increased worldwide [11]. The effectiveness of kidney transplantation in patients with diabetes as opposed to patients without diabetes is still debatable [12-14]. While some studies found that diabetic patients had poor graft survival and mortality, others found no appreciable differences between patients with and without diabetes [13, 14].

This study aims to compare the outcomes of kidney transplantation in diabetic (DM) and non-diabetic patients (NDM).

METHODS

It was a retrospective study and data were collected from Sheikh Zayed Hospital Lahore after approval from the ethical review committee. The study duration was from Sep 2024 to Dec 2024. Ethical Approval was given by the ethical review board of The University of Lahore. (REC-UOL-/401/08/24). A sample size of 100 with a 95% confidence level and 5% margin of error was calculated using Rao software. The sample selection technique involved was non-probability purposive sampling from patients who had kidney transplants between 20-50 years of age. Both male and female patients were included. ABO conflicting or human leukocyte antigen-sensitized kidney transplantation and immunocompromised patients were excluded. After getting informed consent from patients a total of 100 patients were enrolled in this study. To compare outcomes of transplant in diabetic and non-diabetic patients' variables that were measured include: 1) per graft fluid collection, 2) superficial wound infection, 3) incision hernia, 4) superficial wound dehiscence, 5) cellulitis, seroma, 6) fascial dehiscence, 7) deep wound infection, 8) hypertension, 9) death and recovery. SPSS version 23.0 was used to analyze the data. The distinction between the final results of kidney transplant recipients with DM and those with NDM was described using frequency and percentage. To look for statistically significant variances in results, Fisher's exact test was applied and a p-value<0.05 seemed significant.

RESULTS

Out of 100 patients that had kidney transplantation 48% were in the age group of 41-50 years of age. Seventy-nine percent of patients were female. A statistically significant variance was investigated in per graft fluid collection among diabetic and non-diabetic kidney transplant patients i.e., 68% vs 32% respectively with p-value≤0.05 (Table 1).

Table 1: Demographic Analysis of Diabetic Kidney Transplant Patients

Variables	%	p-value
Gender		
Female	79%	- -
Male	21%	
Age		
41-50 Years	48%	- -
Graft Fluid Collection		
Diabetic Kidney Transplant Patients	68%	≤0.05
Non-Diabetic Kidney Transplant Patients	32%	

A significant variance was noticed in the occurrence of incisional hernias between groups, with an elevated occurrence incidence in non-diabetic patients. Facial dehiscence also gives a statistically significant difference, with an elevated occurrence in non-diabetic patients (p=0.010). Six diabetic kidney transplant patients died compared to 3 non-diabetic patients (Table 2).

Table 2: Outcome of Kidney Transplant in DM and NDM Patients

Outcomes	DM	NDM	p-value
Superficial Dehiscence	52	43	0.530
Per Graft Fluid Collection	68	32	0.003
Superficial Wound Infection	61	39	0.086
Incisional Hernia	28	72	0.0003
Cellulitis	43	57	0.271
Seroma	39	61	0.086
Facial Dehiscence	34	66	0.010
Deep Wound Infection	59	41	0.177
Hypertension	51	49	0.903
Death	6	3	0.683
Recovery	44	47	0.898

DISCUSSION

The outcomes of kidney transplant patients often vary based on underlying health conditions, with diabetes being a critical factor that can influence post-operative recovery and complications [15]. This research sought to understand the post-transplant outcomes between NDM and DM patients. Our findings showed considerable differences in some outcomes, emphasizing the unique challenges of diabetic patients after kidney transplantation. The frequency of per graft fluid collection was considerably higher in the DM group than in the NDM group (p=0.003). This implies that diabetic patients might be at increased risk of having fluid-related complications after transplant, based on diabetes's impact on wound healing and vascular integrity [16]. The incidence of incisional hernias was notably distinguished between the two groups, with the NDM group showing a higher rate. This result is surprising, considering a greater risk might be expected in diabetic patients based on more compromised tissue quality. It may represent variation in surgical

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methods, post-operative care, or overall health of the patients [17]. For superficial dehiscence, superficial wound infection, cellulitis, seroma, deep wound infection, HTN, death, and recovery for other outcomes, there were no differences between DM and NDM groups. This implies that although diabetes mellitus affects some aspects of post-transplantation recovery, its effects may not be felt across all aspects [18, 19]. The comparable hypertension and overall recovery rates between the two groups show that both DM and NDM patients can have similar long-duration outcomes under proper management [20]. The results of this study highlight the need for individualized post-operative care in diabetic patients who undergo kidney transplantation. The substantially increased rates of fluid accumulation in the DM group imply that these patients may require more stringent observation and possibly more intensive fluid and wound management.

CONCLUSIONS

It was concluded that diabetes significantly impacts certain post-transplant outcomes, such as fluid collection, in kidney transplant patients. In contrast, other outcomes like incisional hernia and facial dehiscence are more prevalent in non-diabetic patients. These findings highlight the need for nuanced post-operative care strategies that address the specific risks associated with both diabetic and non-diabetic patients.

Authors Contribution

Conceptualization: MAN
Methodology: AN, SN, MAB
Formal analysis: AN, UN
Writing review and editing: SN, AR, IR

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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