ISSN- 2230-7346
Journal of Global Trends in Pharmaceutical Sciences

# DECEASED DONOR KIDNEY TRANSPLANT WITH ATG INDUCTION AND TRIPLE IMMUNOSUPRESSIVE AGENTS (TACROLIMUS, MMF, PREDNISONE)

**K. Sobha[1], P. Sai Priya[1], Sreedhar Reddy[2], G. Sumalatha[3*]**

[1]Bharat Institute of Technology, Ranga Reddy, Hyderabad, India
[2]Department of Nephrology, Krishna Institute of Medical Sciences, Secunderabad, India
[3]Department of Pharmacy, Chaitanya Deemed to be University, Hanumakonda, India

*Corresponding author Email: **sumalatha2k@gmail.com**

**ARTICLE INFO**

**Key words:**
CKD, GFR, creatinine, triple,immunosuppressants, ATG induction.

Access this article online
Website:
**https://www.jgtps.com**
Quick Response Code:

**ABSTRACT**

**Aim:** To determine the outcomes of deceased donor kidney transplantation with ATG induction and triple immunosuppressive agents (Tacrolimus, MMF, and prednisone). **Materials and Methods:** A prospective observational study was conducted to determine the infection episodes, toxicity/drug induced effects of tacrolimus, mycophenolate, prednisone and ATG induction, graft function at the end of 6 months, graft loss / rejection episodes upto 6 months post transplantation in kidney transplant cases at Krishna Institute of Medical sciences (KIMS),Nephrology department. **Results:** The whole study was conducted on 30 patients out of which 16.66% (immediate graft functioning (GFR: ≥77.56), 60% (slow (GFR: ≥56.21), 23.33% (delayed (GFR: 23.33%). **Conclusion:** The current study helps in determining the improvement of graft functioning (immediate, slow, delayed) by taking triple immunosuppressants and ATG induction.

## INTRODUCTION

Chronic kidney disease (CKD) is defined as abnormalities in kidney structure orfunction, present for three months or longer, with implications for health [1-2]. CKD affects between 8% and 16% of the population worldwide and is often underrecognized by patients and clinicians [3-6].Structural abnormalities include albuminuria of more than 30mg/day, presence of hematuria or red cell casts in urine sediment, electrolyte and other abnormalities due to tubular disorders, abnormalities detected by histology, structural abnormalities detected by imaging, or history of kidney transplant. CKD is classified by cause of kidney disease, glomerular filtration rate (GFR) category, and albuminuria level based on new recommendations from the kidney Disease: Improving global outcomes (KDIGO) guidelines, referred to CGA staging (cause, GFR, albuminuria). CKD stage 5, previously referred to ESRD, occurs when the GFR falls below 15ml/min/1.73m$^2$ or in patients receiving renal replacement therapy (RRT) [7]. Hence the present study was designed to assess the effects of triple immunosuppressive agents and ATG induction in deceased donor kidney transplant patients in KIMS hospital.

## MATERIALS AND METHODS

A prospective, observational study was conducted in kidney transplant patients treated with triple immunosuppressive agents and ATG induction in Nephrology department at Krishna Institute of medical sciences over the period of six months. All CKD patients of

either sex with or without co-morbidities treated with immunosuppressive agents and ATG induction were included in the study. The patients case sheet of both gender with or without co-morbidities such as hypertension, diabetes, CKD (stage-5) were collected for this study.

**STATISTICAL ANALYSIS**

Data was collected from the collected case sheets and entered in Microsoft Excel office (2007) spreadsheet and analyzed. Total number of patients and percentages were used to represent graft functioning (immediate, slow, delayed), drug toxicity, infection episodes.

**RESULTS**

**GRAFT FUNCTIONING**

Graft functioning was showed in Table 1. The whole study was on 30 patients out of which 16.66% patients were showing immediate graft functioning, 60% patients were slow graft functioning, 23.33% patients were delayed graft functioning at discharge.

At the end of 6 months 16.66% of patients were having an average GFR of (people with immediate graft function) ≥77.56, 60% of patients were having an average GFR of (people with slow graft function) ≥56.21, 23.33% of patients were having an average GFR of (people with delayed graft function) ≥31.5.

**INFECTION EPISODES**

Patients with infection episodes and without infections were presented in Table 2. Out of 30 patient cases, it was found that 3 patients were under infection episodes and 27 were found without any infection episodes.

**TOXICITY OR DRUG-INDUCED EFFECTS OF IMMUNOSUPRESSANTS AND ATG INDUCTION**

Toxicity or drug-induced effects of immunosuppressants and ATG induction were showed in Table 3. Out of 30 patients, no toxic effects were found in all the 30 patients.

**AGE WISE CATEGORIZATION OF THE PATIENTS**

Age wise categorization of the patients was presented in Table 4. Out of 30 cases, the patients belonging to age group of 18-30 years were found to be 9, 31-45 years were found to be 12 and 46-70 years were found to be 9.

**GENDER WISE DISTRIBUTION OF THE PATIENTS**

Gender wise distribution of the patients was given in Table 5. Out of 30 patients, 22 (73.33%) were male patients and 8 (26.66%) were female patients.

**AGE AND GENDER WISE CATEGORISATION OF THE PATIENTS**

Age and gender wise categorization of the patients was showed in Table 6. Out of 30 patients, 6 were found to be male patients (20%) and 3 were female patients (10%) belonging to the age group of 18-30 years, 9 were male patients (30%) and 3 were female patients (10%) belonging to the age group of 31-45 years,7 were male patients (23.33%) and 2 were female patients (6.66%)belonging to the age group of 46-70 years.

**TABLE: 1Graft functioning**

| S.NO. | GRAFT FUNCTIONING AT DISCHARGE | TOTAL NO. OF SUBJECTS | OVERALL% OF SUBJECTS | AVG. GFR AT END OF 6 MONTHS |
|---|---|---|---|---|
| 1 | Immediate | 05 | 16.66% | ≥77.56 |
| 2 | Slow | 18 | 60% | ≥56.21 |
| 3 | Delayed | 07 | 23.33% | ≥31.5 |

**TABLE: 2 - Infection episodes**

| CATEGORY | FREQUENCY | PERCENTAGE |
|---|---|---|
| No.of patients | 30 | 100% |
| No.of patients with infection episodes | 3 | 10% |
| No.of patientswithout infection episodes | 27 | 90% |

**TABLE: 3 - Toxicity/Drug-Induced Effects of Immunosuppressants And Atg Induction**

| CONDITION | NO.OF EFFECTED PATIENTS | OVERALL % |
|---|---|---|
| **Toxic** | 0 | 0% |
| **Non-toxic** | 30 | 100% |
| **Total** | 30 | 100% |

**TABLE: 4- Age wise categorization of the patients**

| S.NO. | AGE DISTRIBUTION | NUMBER OF PATIENTS |
|---|---|---|
| **1** | **18-30** | **09** |
| **2** | **31-45** | **12** |
| **3** | **46-70** | **09** |

**Table: 5- Gender wise categorization of the patients**

| S.NO. | GENDER | NO. OF PATIENTS | PERCENTAGE |
|---|---|---|---|
| **1** | **Male** | **22** | **73.33%** |
| **2** | **Female** | **08** | **26.66%** |

**TABLE: 6 - Age and gender wise categorization of the patients**

| AGE | MALE | | FEMALE | | TOTAL NO. OF SUBJECTS | OVERALL PERCENTAGE (%) |
|---|---|---|---|---|---|---|
| | Frequency | % | Frequency | % | | |
| 18-30 | 6 | 20 | 3 | 10 | 9 | 30 |
| 31-45 | 9 | 30 | 3 | 10 | 12 | 40 |
| 46-70 | 7 | 23.33 | 2 | 6.66 | 9 | 30 |
| **TOTAL** | 22 | 73.33 | 8 | 26.66 | 30 | 100 |

## DISCUSSION

The current study helps in determining the improvement of graft functioning (immediate, slow, delayed) by taking triple immunosuppressants and ATG induction, by determining the percentage of slow, immediate and delayed graft functioning.During the six months study period, total number of 30 patients who visited the Nephrology department at Krishna Institute of medical science and undergone deceased donor kidney transplantation along with immunosuppressive therapy and ATG induction were selected. Total 30 deceased donor kidney transplant patients (both comorbid and non- co morbid) were distributed into different groups based on factors like graft functioning,GFR values, infection episodes and drug toxicity. Out of 30 patients, 16.66% of patients were showing immediate graft functioning (≥77.56 GFR), 60% of patients were showing slow graft functioning (≥56.21 GFR), 23.33% of patients were showing delayed graft functioning (≥31.5 GFR). Out of 30 patients, it was found that 3 patients were under infection episodes and 27 were found non-infectious and no toxic effects were found in all the 30 patients. CKD is estimated to be more common in women than in men (16% vs 13%) [2, 8].CKD is also estimated to be more common in non-Hispanic blacks than in non-Hispanic whites (18% vs 13%). 15% of Hispanics are estimated to have CKD. The main reported causes of new cases of ESRD are diabetes, high blood pressure and glomerulonephritis (inflammation of kidneys).**Antithymocyte globulin (ATG)** is produced by immunizing rabbits or horses with human thymocytes generating polyclonal antithymocyte antibodies. The major mode of action for ATG is the depletion of T cells. ATG also targets a wide range of antigens displayed on B cells, dendritic cells, NK cells, endothelial cells and disrupts cell trafficking. The goal of immunosuppressive therapy is to prevent the graft destructive immune response.

## CONCLUSION

The current clinical research study conducted at KIMS hospital, Secunderabad using 30 subjects who underwent kidney transplantation with deceased donor and the outcomes of triple immunosuppressants (tacrolimus, mycophenolate mofetil, prednisolone) and ATG induction (given before the transplantation to prevent the rejections) and GFR at discharge and at the end of 6 months were noticed to determine the graft functioning of transplanted kidney.

The current study illustrated improvement and stability in graft functioning of the recipients. The limitations that should be taken while planning this study, no formal calculation was done to estimate the number of patients required. The total number of patients was considered based on the feasibility and the limited time that was available to complete the study. The study was 6 months duration. This limited duration of the study might have not allowed reaching the maximum effect. Hence, future studies with long-term duration are recommended.

**ACKNOWLEDGEMENTS**

The authors thank the management of Bharat Institute of Technology, Mangalpally and Department of Nephrology, Krishna Institute of Medical Sciences, Secunderabad for providing adequate support to carry out the research work.

**REFERENCES**

1. Chapter 1: Definition and classification of CKD. Kidney Int Suppl (2011). 2013 Jan;3(1):19-62.
2. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney Int Suppl. 2013;3(1):1–150.
3. Coresh J, Selvin E, Stevens LA, *et al*. Prevalence of chronic kidney disease in the United States. JAMA. 2007;298(17):2038–2047.
4. Hsu CY, Vittinghoff E, Lin F, Shlipak MG. The incidence of end-stage renal disease is increasing faster than the prevalence of chronic renal insufficiency. Ann Intern Med. 2004;141(2):95–101.
5. Plantinga LC, Boulware LE, Coresh J, *et al*. Patient awareness of chronic kidney disease: trends and predictors. Arch Intern Med. 2008;168(20): 2268–2275.
6. Jha V, Garcia-Garcia G, Iseki K, *et al*. Chronic kidney disease: global dimension and perspectives. Lancet. 2013;382(9888):260–272.
7. Dipiro, Pharmacotherapeutics, 9th edition, 2015, pg: 787.
8. Hemmelgarn BR, James MT, Manns BJ, *et al*. Rates of treated and untreated kidney failure in older vs younger adults. JAMA. 2012; 307(23):2507–2715.