

# The efficacy of Anti T-Lymphocyte Globulin as Induction Therapy in Kidney Transplantation: A Single-Center Retrospective Analysis

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# Background

Polyclonal IgG preparation produced by immunizing **rabbits** against a homogenous **human T- lymphoblastoid cell line Jurkat**.

In India, the average cumulative dose of ATLG (Anti T Lymphocyte Globulin) used in low to intermediate immunological risk patients is ~6 mg/kg body weight.[1]

In high immunological risk patients, the average cumulative dose of Grafalon used is 8-10 mg/kg. [2]

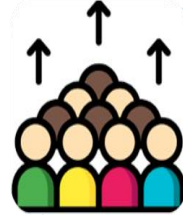
## Mechanism of Action of ATLG

- **Mechanism of Action of ATLG is the rapid depletion of Peripheral T Cells by Targeting T Cell directly and T cell markers including CD2, CD3, CD4, CD8, CD11a, CD44 and CD45 co-stimulatory and adhesion molecule on Antigen presenting Cells (APC)[3]**

# Material and Method



**Study type:** Single Center, retrospective study



**Number of Subjects(n):** 125  
(Mean age:  $44.8 \pm 13.6$ )



**Treatment:** ATLG as Induction agent + Standard triple drug regime(Follow-up) ATLG dose 6mg/kg.



**Kidney transplant during:** May 2019 to May 2022

# Results

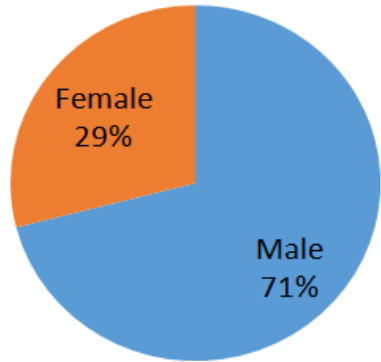


Fig 1: Gender Distribution (n=125)

HLA Typing (n=125)%	
Related	8.2%
Unrelated	91.8%

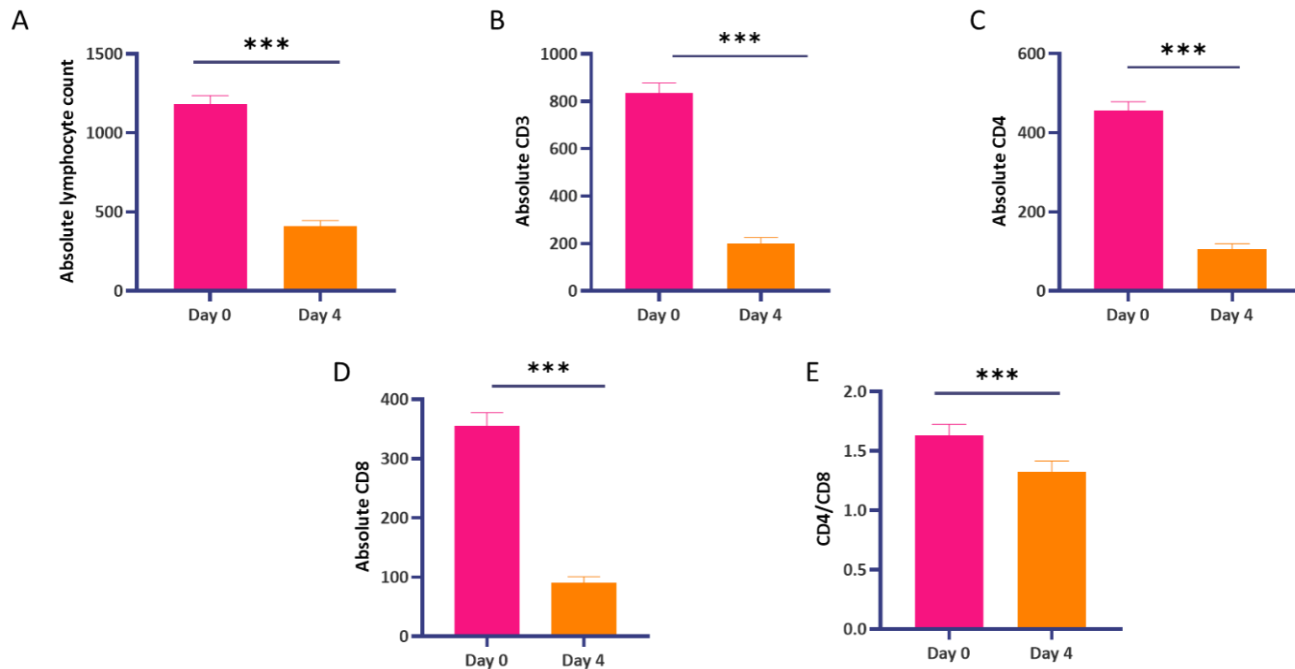
Donor gender	Recipient gender	%
Female	Male	14.75
Female	Female	8.2
Male	Female	27.87
Male	Male	49.18

## Transplant Outcome following ATLG Induction

Parameter	Observation
<b>Death</b>	<b>6 (4.8 %)</b>
Acute Liver Failure	1 (0.8%)
ABMR	1 (0.8%)
Covid - Pneumonia	4 (3.2%)
<b>Graft Rejection</b>	<b>12 (9.6 %)</b>
ABMR (Antibody mediated rejection)	5 (4 %)
Cell mediated rejection	7 (5.6 %)
<b>Infective Episodes</b>	
Uro-Sepsis (E-coli)	8 (6.4 %)
Pneumonia	7 (5.6 %)
Azotemia	1 (0.8 %)
ATN	1 (0.8 %)
Leucopenia	2 (1.6 %)
<b>Patient Survival (after 52 weeks)</b>	<b>95.2% (n = 119)</b>

# Observed Immune deficiency panel after usage of ATLG on Day 6

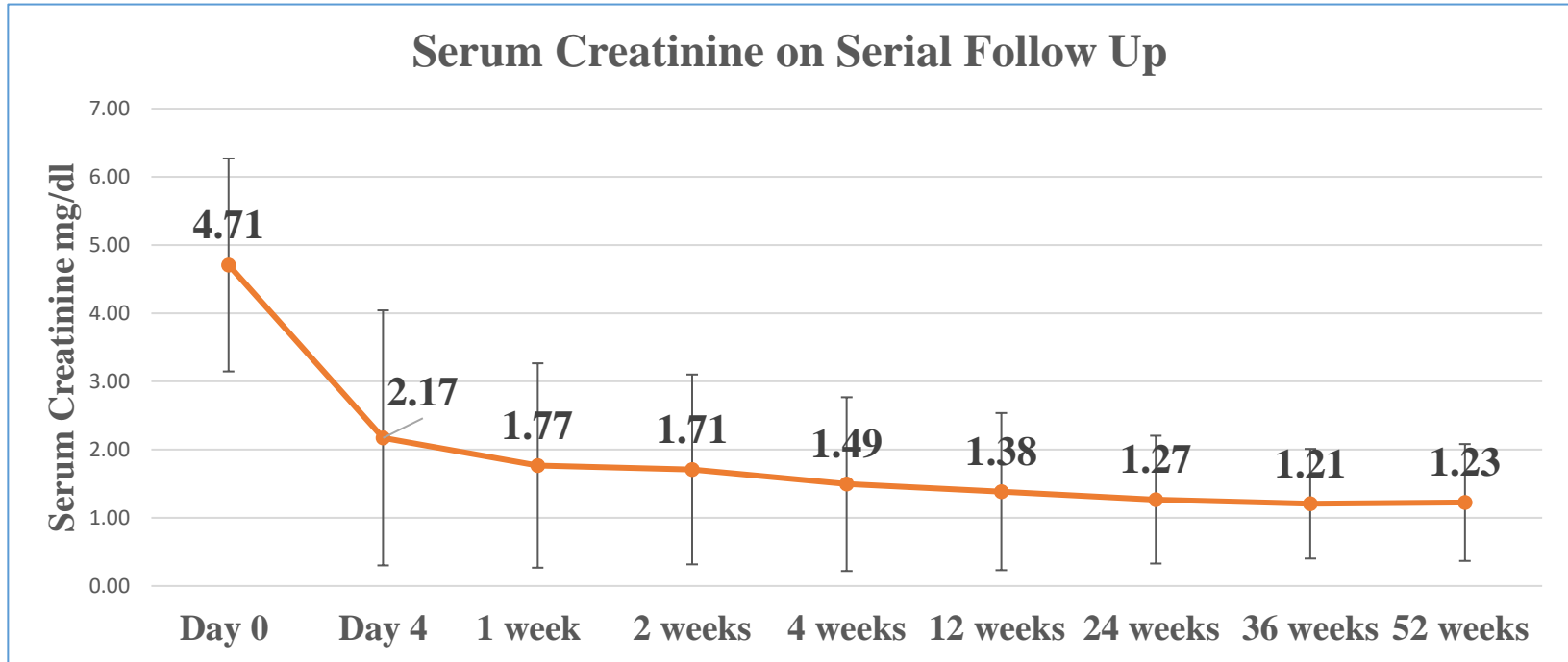
## Observed Immune Deficiency Panel after ATLG Usage on Day 0



A- Absolute Lymphocyte Count, B – Absolute CD3 Count, C- Absolute CD4 Count, D- Absolute CD8 count, E- CD4/CD8 Ratio. Data is represented Mean±SEM. \*\*\*  $p < 0.0001$  vs Day 4.

**Figure 2:** Immune suppression following ATLG induction on Day 6

# Serum Creatinine on serial Follow Up



During Follow up Graft function is well preserved for 52 weeks

**Figure 3:** Serum Creatinine post Transplant following ATLG Induction

# Discussion

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Current study showed analysis of 125 patients who received ATLG as an Induction agent before Kidney transplant.

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Current study line Showed Male predominance (n=89, 71%) compared to female gender which is similar inline with the study done by Gang S et al where Male also represented (83%). [1] Age distribution of the current study is  $44.8 \pm 13.6$  year which is similar in line with study done by Gupta A et al  $41.42 \pm 12.67$  years. [4]

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Mean Dose of ATLG used in current study is 6 mg/kg according to body weight which similar to study done by Gupta A et al where dose used is  $5.81 \pm 1.95$  mg/kg. [4]

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In our study Majority of patients are HLA unrelated and majority gender relation between Donor and recipient are Male to Male.

# Discussion

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After ATLG treatment significant suppression of immune system as shown in Figure 2. similar result observed study done by Popow I et al 2013[5].

Increasing numbers of sensitized patients, of unrelated donors make ATLG more favorable in an induction regimen which could be seen in Yilmaz et al, 2017 [2].

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Usage of ATLG as an Induction agent shown good graft function post transplant and sustained Graft function (Figure 3), post 52 weeks. Similar observations are seen with the study done Gang S et al 2022[1] and Gupta A et al 2022[4].

Result duplicates the overall survival of transplant patients (95. 2%) out of 125 patients. 6 patients died with Acute liver failure (n=1), ABMR(n=1) and due to Covid Pneumonia (n=4) cases.

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Rejection was seen in 12 (9.6%) cases where 7 (5.6%) cases are due to Cell mediated rejection and 5 (4 %) cases ABMR which was similar to Kaden et al. [6].

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The study shown Uro-sepsis cases of which majority of E-coli (6.4%).

Limitation of our study is it's a retrospective study and there is no comparator arm to study.



## Conclusion

- Through the comprehensive assessment of Anti-T-Lymphocyte Globulin's (ATLG) influence on immunosuppression efficacy and organ survival in kidney transplant recipients, this study endeavors to provide essential insights aimed at refining transplant management strategies and improving patient outcomes.

## Future Prospects

- ATLG as an induction agent useful in prevention for Graft rejection and long survival of patient with Kidney Transplant. More studies are required to understand the Immune suppression and Immune reconstitution post ATLG treatment.

# References

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