World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

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Successful desensitization and early outcomes in two highly sensitized living-related kidney transplant recipients at IBN Sina Teaching Hospital, Sirte, Libya

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World Journal of Advanced Research and Reviews, 2026, 29(02), 609-612

Publication history: Received on 30 December 2025; revised on 07 February 2026; accepted on 09 February 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.29.2.0267

Abstract

Highly sensitized kidney transplant candidates face significant immunologic barriers due to high donor-specific antibody (DSA) titers. This study reports the first two highly sensitized living-related kidney transplant recipients successfully desensitized at Ibn Sina Teaching Hospital, Sirte, Libya, using plasmapheresis and rituximab without IVIG. Both patients exhibited DSA >5000 Mean Fluorescence Intensity (MFI) pre-desensitization. After 5–7 plasmapheresis sessions and rituximab, DSA levels fell below 500 MFI, permitting safe transplantation. Both received ATG induction and standard maintenance therapy. Immediate graft function occurred with serum creatinine <1 mg/dL at 72 hours. No delayed graft function, rejection, or infection occurred. These findings demonstrate that simplified desensitization can expand transplant access in developing countries.

Keywords: Kidney Transplant; Highly Sensitized Recipient; Donor-Specific Antibodies; Plasmapheresis; Rituximab; Desensitization; Living Donor Transplantation; ATG Induction; HLA Antibodies; Libya

1. Introduction

Kidney transplantation remains the optimal therapy for end-stage renal disease (ESRD). However, highly sensitized patients those with elevated donor-specific antibodies (DSA) face greater risk of hyperacute rejection and antibody-mediated rejection (AMR) [4]. In high-resource settings, desensitization may involve plasmapheresis, IVIG, rituximab, proteasome inhibitors, complement blockers, or imlifidase [1,2]. However, such therapies may be infeasible in developing systems. In Libya, limited immunologic infrastructure historically restricted access to transplantation for sensitized recipients. The 2025 collaboration between Ibn Sina Teaching Hospital and the Arab Renal Care Group (ARCG) introduced structured immunologic screening and desensitization workflows. This manuscript presents the first two highly sensitized recipients desensitized and transplanted using a no-IVIG protocol based on plasmapheresis and rituximab [3].

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2. Methods

Both patients underwent HLA typing, PRA testing, CDC crossmatch, flow cytometry crossmatch, and single-antigen bead assays. Both had PRA >80% and strong class I and II DSA >5000 MFI.

2.1. Desensitization consisted of

- Plasmapheresis (5–7 sessions using albumin or fresh frozen plasma replacement)
- Rituximab 375 mg/m^2 administered twice: first on Day −14 and second on Day −7 prior to transplant
- No IVIG was used.

Final testing 48 hours pre-transplant confirmed DSA <500 MFI and negative CDC crossmatch. Induction was with ATG (3–4 mg/kg). Maintenance therapy included tacrolimus, mycophenolate mofetil, and prednisone. DSA was checked every 2–4 weeks post-transplant; creatinine measured daily for 1 week; and CMV/BK PCR monthly.

3. Results

Both patients demonstrated immediate graft function with rapid reduction in serum creatinine and sustained suppression of donor-specific antibodies. No delayed graft function, rejection, or infectious complications occurred (table1and 2) (figure1 and 2)

Table 1 Serum creatinine trend from pre-transplant baseline to 24-week post-transplant follow-up

Time Point	Case 1	Case 2
Pre-transplant	12.1	11.6
24 hours	5.3	4.8
48 hours	2.2	2.0
72 hours	0.92	0.88
Day 7	0.88	0.85
Week 2	0.84	0.83
Week 4	0.82	0.81
Week 8	0.80	0.79
Week 24	0.78	0.77

Table 2 Donor-Specific Antibody Trends (Mean Fluorescence Intensity, MFI) from pre-transplant baseline to 24-week post-transplant follow-up

Time Point	Case 1	Case 2
Pre-desensitization	>5000	>5000
Pre-transplant	420	390
Week 2	310	280
Week 4	220	210
Week 6	180	170
Week 8	160	155
Week 24	120	110

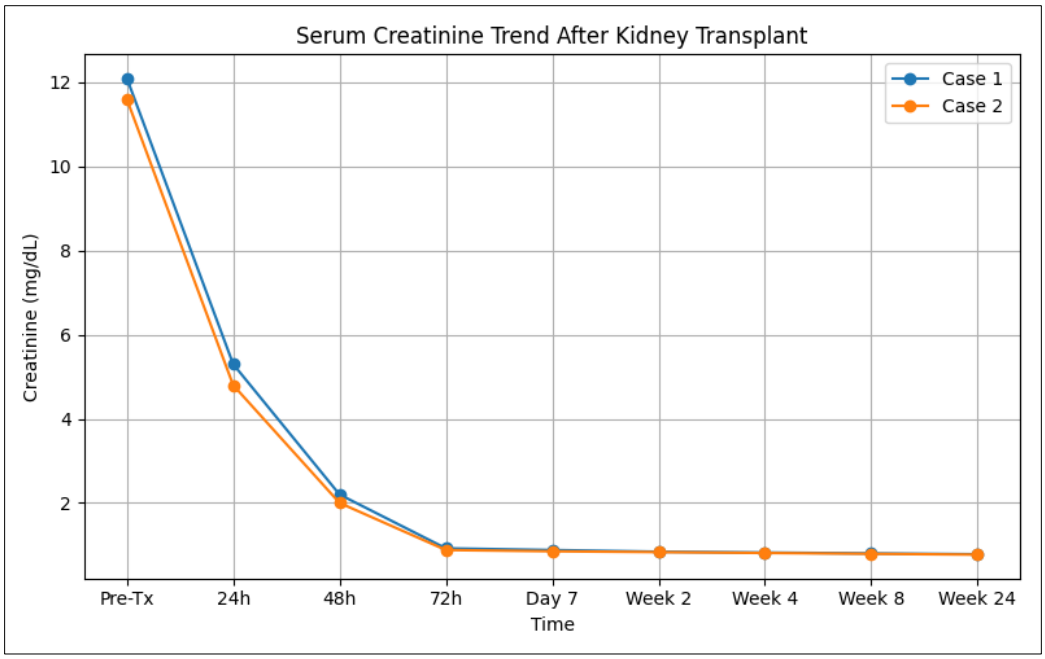

Figure 1 Serum creatinine trend from pre-transplant baseline to 24-week post-transplant follow-up

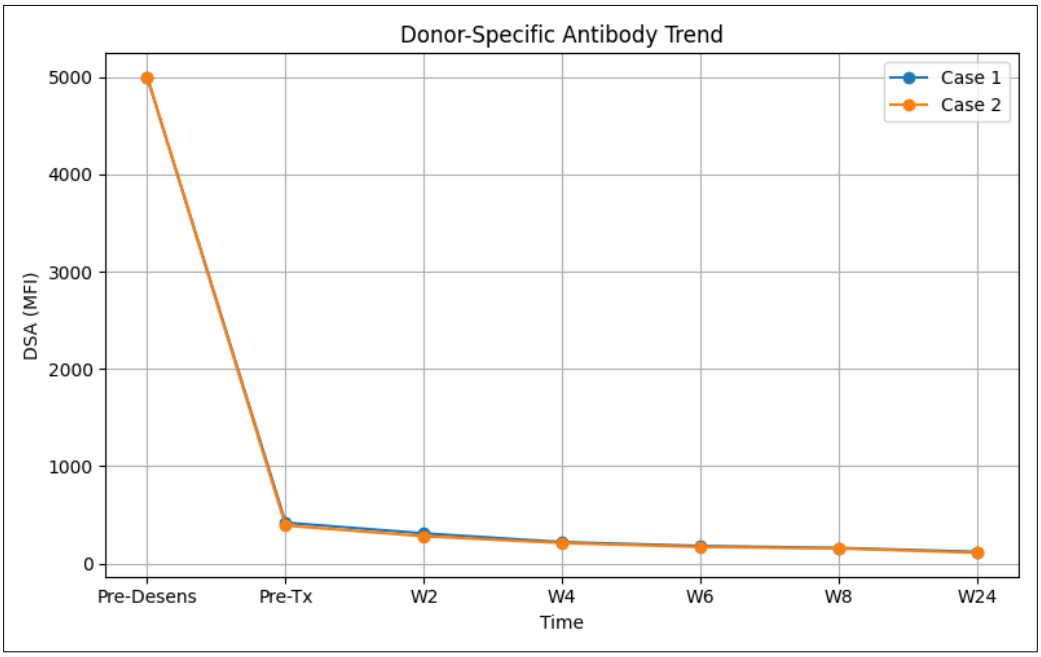

Figure 2 DSA trend from pre-transplant baseline to 24-week post-transplant follow-up

4. Discussion

These cases demonstrate that even highly sensitized kidney transplant candidates can safely undergo transplantation in a resource-limited setting using a simplified desensitization protocol. Plasmapheresis effectively reduced circulating antibodies, while rituximab prevented rebound by depleting CD20+ B cells [1–3]. Unlike traditional protocols relying on IVIG, this strategy is cost-effective, less resource-intensive, and more feasible in developing regions. International literature supports the idea that plasmapheresis plus rituximab alone can be sufficient for desensitization in selected patients [2,3]. These outcomes also highlight the critical importance of structured immunologic evaluation, multidisciplinary coordination, and rigorous monitoring [4,5].

Limitations

This report is limited by its small sample size and short follow-up duration, restricting generalizability and long-term outcome assessment. Advanced immunologic assays and surveillance biopsies were not available. Additionally, formal cost-effectiveness analysis of the IVIG-free protocol was not performed. Larger studies with extended follow-up are required to validate these preliminary findings.

5. Conclusion

The first two desensitized living-related kidney transplants performed in Sirte, Libya achieved excellent early outcomes using a no-IVIG protocol. Both patients exhibited rapid renal recovery, stable graft function, and no rejection. This experience demonstrates the feasibility and safety of desensitization in developing healthcare environments and provides a foundation for expanding transplant access in Libya.

Compliance with ethical standards

Acknowledgments

To His Excellency General Saddam Khalifa Haftar, for his unwavering support and national vision enabling kidney transplantation in Sirte, Libya.

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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