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A Survey of National Practices of Anaesthesia for Live Donor Renal Transplantation

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ABSTRACT

Objective: To compare the institutional practices among patients undergoing living-related renal transplants in different hospitals throughout Pakistan.

Study Design: Cross-sectional survey.

Place and Duration of Study: Armed Forces of Institute of Urology, Rawalpindi Pakistan, from Jun 2020 to Jan 2021.

Methodology: Pakistan's leading kidney transplant centres were sent data electronically to ask about their anaesthetic practices. The methodology adopted was a simple questionnaire model that included 26 questions encompassing all the steps the anaesthesia team took for renal transplant. Uniformity in anaesthetic practices was expected in large centres through rigorous training and workload management. The teams responded according to their standard operating procedures and compared their answers using statistical formulas.

Results: Nine out of 11(81.8%) institutes responded. Marked heterogeneity in Anaesthesia practices was found among different institutes. Only 2(18.2%) institutes had Anaesthesia guidelines for a kidney transplant.

Conclusion: There is a need for centralized country-specific homogeneous guidelines for Anaesthesia for the kidney transplant to improve outcomes.

Keywords: Anesthesia practices, Renal transplant, Survey.

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INTRODUCTION

Kidney transplant recipients are a complex cohort of patients with unique pathophysiological issues.[1] They challenge the anesthesiologist regarding chronic kidney disease and its underlying causes.[2] With advances in immunosuppression, kidney transplant recipients are increasing in numbers, with more and more patients of advanced age and comorbid. This scenario mandates evidence-based perioperative anaesthesia practice.[3,4]

Patient outcomes can be improved significantly if evidenced-based practices are adopted, as these patients have multiple morbidities with acid-base and electrolyte disturbances.[5] Ephedrine is the most common agent in Pakistan, though, on the international date, Dopamine remains the most popular.[6,7]

Only living kidney donation is practised in Pakistan, and recipients undergo extensive evaluation before transplant, so there is a high demand for immaculate perioperative care.[8,9] So far, there are no national anaesthesia guidelines for the perioperative management of kidney transplant recipients. The absence of a centralized national regulatory body further hampers the communication between different transplant centers.[10] This survey is a humble effort to highlight the importance of adhering to evidence-based practices for living kidney transplant recipients' perioperative management.

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METHODOLOGY

The cross-sectional survey was conducted from June 2020 to January 2021 at Armed Forces of Institute of Urology, Rawalpindi Pakistan. Institutional Review Board permission was taken from AFIU (Uro-Adm-Trg-1/2021/122).

Inclusion Criteria: Pakistan's leading kidney transplant institutes performing live donor renal transplantation, were included in the survey.

Exclusion Criteria: Institutes not under HOTA jurisdiction were not sent this survey, e.g. AJK.

This survey was established to compare the entire event of patients enduring renal transplantation. Contribution regarding questionnaire development was taken from doctors' proficiency in this field, including anaesthetists, urologists, nephrologists, intensivists and cardiologists. In addition, an electronic survey was circulated to top kidney transplant anaesthetists at the 11 main live donor renal transplantation centres across Pakistan.

The survey was sent to all institutions conducting living donor kidney transplants as routine procedures across Pakistan. The information required in the questionnaire included the Presence of kidney transplant SOPs/guidelines, Use of preoperative RCRI, Dialysis practice before surgery, Fluid management, Intraoperative anaesthesia monitoring, Vasoactive drugs, Reperfusion management, and analgesia.

A total of 26 questions were included in this survey and were further distributed into preintra and post-operative management. These questions were meant to understand the uniformity and heterogeneity in anaesthetic practices among the leading institutes of Pakistan. The design of questions was close to avoid ambiguous responses, and free text option was given to provide elaborative answers.

Statistical Package for Social Sciences (SPSS) version 20.0 was used for the data analysis. Quant-itative variables were expressed as mean±SD and qualitative variables were expressed as frequency & percentages.

RESULTS

The survey was sent to 11 institutes performing live donor renal transplantation, out of them nine (81.81%) sent complete responses to our survey. Anaesthesia-specific guidelines for a kidney transplant were in vogue in two (22.22%) institutes, while all rest had guidelines in place but mainly for urology & nephrology.

Table-I: Cardiac Investigations (n=9)

Cardiac Investigations	No. of Centres
Transthoracic 2D – Echo	9(100%)
Pulmonary function tests (spirometry)	5(55.55%)
Stress Echo	3(33.33%)
Coronary Angiography	2(22.22%)
6 Minutes' walk test	2(22.22%)
Cardiopulmonary exercise testing	0(0%)
Myocardial perfusion scan	0(0%)

Table-I shows the percentage of cardiac tests done in every institute for such patients. For patients requiring dialysis before transplant, the aim of dry weight was in 8(88.88%) institutes. At the same time, 1(11.11%) stated that they do not specify a preoperative target weight.

While there was no institute aiming for 1-2kg above dry weight preoperatively. It is being carried out by consultant anaesthetists widely in all institutes. Only 1(11.1%) was instituted by pulse pressure variation. Other parameters measured are shown in Table-II.

Table-II: Intraoperative Parameters (n=9)

IV saline used	0.9% Saline	8(88.88%)
	Balanced Salt Solution	1(11.11%)
	Hypertonic Saline	0 (0%)
Anticipated average operative blood loss	0-250ml	2(22.22%)
	250-750ml	6(66.66%)
	750ml	1(11.11%)
Intraoperative fluid administration	continuous infusion along with infusion pump	3(33.33%)
	continuous infusion without infusion pump	3(33.33%)
	Boluses added to infusion	2(22.22%)
	Boluses only	1(11.11%)
Arterial line insertion	Regular insertion	6(66.66%)
	Occasional insertion	2(22.22%)
	Never	1(11.11%)
Targeted BP measurement	Followed	8(88.88%)
	Not followed	1(11.11%)

Target CVP showed wide variation from 8-18cm H_2O. All the statistics are shown Figure-1. Intraoperative drug use has been elaborated in Figure-2.

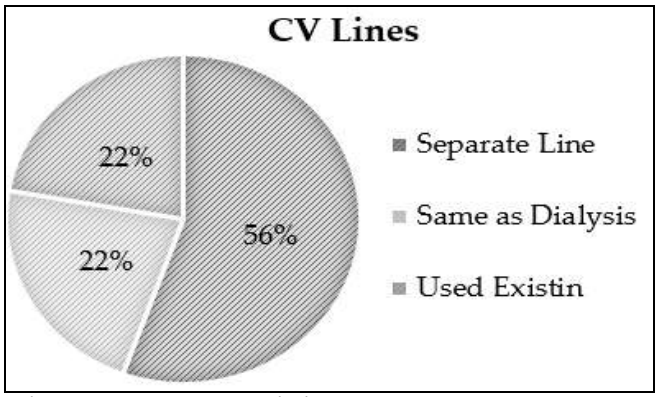

Figure-1: Target CVP Variation

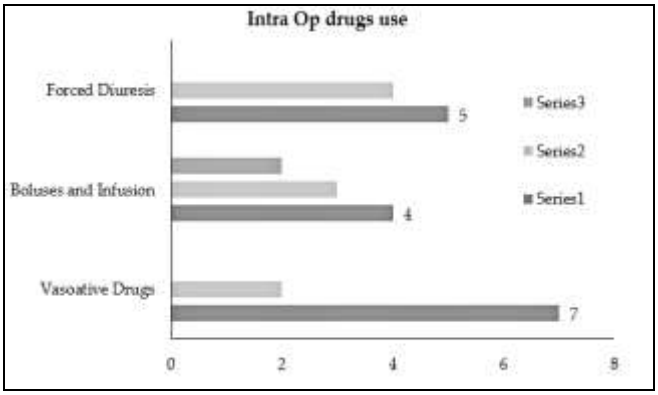

Figure-2: Intraoperative Drug use

All centres used Atracurium for muscle relaxation. Analgesia practices for kidney and transplants are many variables. 3(33.33%) institutes employ TAP block

for postoperative analgesia. At the same time, the remaining 6(66.66%) do not employ the TAP block or any other regional block. TAP block is administered mostly ultrasound guided or, in some cases, via landmark technique. Among institutes employing TAP block, it is administered by an anaesthetist and in one institute after induction of anaesthesia while remaining after the case. PCA is used by one institute only, and fentanyl is used in PCA. In our institute, multimodal analgesia is used with Nalbuphine, Paracetamol, Dexmedetomidine and local infiltration at the end of surgery. Dexmed-etomidine analgesic profile is much less studied in renal transplant recipients but has promising effects with very low pain scores, and the need for rescue analgesic is minimized. All the institutes shift the patient to some ICU or high dependency unit, but only 3(33.33%) institutes have a purpose-built Renal HDU/ICU. Enhanced recovery pathway for live donors is in place in only 1(11.11%) institute.

DISCUSSION

In the perioperative period, there is much ambiguity in current Pakistan transplant practices. This disparity in practice is non-dependent on the surgical bulk of the institute. Some of these institutes have centre-specific guidelines for cadaveric renal transplant, but there are specific to that institute and disparate in their content.[11] Considering the high surgical volume of living kidney transplants, it would be reasonable to develop national consensus guidelines for kidney transplants.

Our current survey highlights some components of practices which can be harmful to a recipient as based on evidence. First, when administered routinely, the chloride-rich solution can lead to decreased diuresis and kidney blood flow leading to metabolic acidosis compared to buffered salt solutions.[12]

In kidney transplant surgeries, the chances of fluid loss are quite less. However, one centre in the study reported higher loss (>750ml). However, a well-known practice is infusing a generous amount of crystalloids before clamping renal vessels to expand the intravascular volume to avoid post-operative API (Acute tubular necrosis).[13] However, it carries an increased risk of fluid overload, and so far, no data has been found in favour of positive fluid balance. Rather some retrospective data show a strong association between fluids >2500ml and chronic renal allograft dysfunction. Here comes the role of CO-based goal-directed fluid therapy and setting a target CVP value. Though in Pakistan, currently, CO-based goaldirected therapy is not in vogue, a targeted CVP-based fluid approach is used by most institutes.[14]

Renal graft reperfusion management is highly variable among different institutes and is not evidence-based. Evidence to use Furosemide and Mannitol for forced diuresis is either retrospective or outdated and on a small patient population, mostly in a single center.[15] Regarding Furosemide, it has been used for forced diuresis to shorten AKI duration, reduce the need for dialysis and improve either outcome for transplant candidates or otherwise, but it is not proven. Mannitol should also be judicious, as accompanying hydration can lead to positive fluid balance. In our study, 4(44.44%) institutes are not using Furosemide in routine, whereas 6(66.66%) institutes use Mannitol.

Use of vasoactive drugs; choice of a particular drug and its mode of administration also has a broad spectrum.[16] Ephedrine is the most common agent in Pakistan, though, on the international date, Dopamine remains the most popular. So far, no conclusive evidence has been found to recommend the regular use of vasoactive agents to improve renal perfusion, urine flow and creatinine clearance. However, there is also no study to show any harmful effects.[17] So this area needs more attention and research work to develop evidence-based guidelines. In Pakistan, Renal transplant is managed by anaesthesia consultants only. However, we need to focus on transplant anaesthesia as it needs to be better represented in the curriculum and training program and requires serious redress. Anaesthesia is the backbone of a transplant team.

Post-operative care is also variable and dedicated universally. ERAS pathway is also not adopted well by most of the institutes.[16,17] However, ERAS has many beneficial effects in kidney transplants, demonstrated by studies.[18]

We have seen variations in anaesthesia practices for renal transplant, but these are wider than in Pakistan only. In a literature search, we could not find any homogenous practices in developed countries either.

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CONCLUSION

This nationwide survey has found variations in perioperative practices, some of which must be updated and standardized. Creating a working team and improving national accord guidelines are highly suggested.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SR & AAM: Conception, study design, drafting the manuscript, approval of the final version to be published.

RZ & FW: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

SEHR & MY: Critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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