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CORRELATION OF EARLY GRAFT DYSFUNCTION AND BASELINE DOPPLER ULTRASOUND RESULT



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DISCLOSURE INFORMATION

- I have NO financial disclosure or conflicts of interest with the presented material in this presentation.



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INTRODUCTION

- Allograft doppler ultrasonography is a readily available diagnostic tool to evaluate the renal allograft. Its benefit in evaluating a clinically unremarkable allograft has not yet been well established.



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OBJECTIVES

- The primary objective of this study was to determine which doppler ultrasound parameters will correlate with early graft dysfunction.



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METHODS

Table 2. Demographic and clinical profile of patients (n=450)

	Total (n=450)	With early graft dysfunction (n=67)	Without early graft dysfunction (n=383)	p-value
	Frequency (%); Mean ± SD; Median (IQR)			
Age, years	41.64 ± 13.67	44.55 ± 13.05	41.13 ± 13.72	.059*
Sex				.809†
Male	266 (59.11)	41 (61.19)	225 (58.75)	
Female	184 (40.89)	26 (38.81)	158 (41.25)	
Creatinine, mg/dL	1.20 (0.90-1.90)	5.20 (3.85-6.80)	1.10 (0.80-1.60)	<.001§
Underwent post-transplant dialysis	5 (1.11)	2 (2.99)	3 (0.78)	.162‡
Doppler ultrasound parameters				
Resistive index [n=24]	0.99 (0.97-1)	-	0.99 (0.97-1)	-
Pulsatility index [n=444]	1.80 (1.61-2.10)	2.10 (1.80-2.70)	1.80 (1.60-2)	<.001§
Peak systolic velocity [n=447]	83 (54.35-119.70)	71.75 (42.62-116.75)	84.40 (56-120)	.149§

Statistical tests used: §–Mann-Whitney U test; *–Independent T-test; †–Chi-square test; ‡–Fisher’s exact test

- A retrospective chart review of patients who underwent kidney transplantation between January 2017 to December 2021 done at the National Kidney and Transplant Institute, and had a baseline post-operative renal allograft doppler ultrasound were included in the study.
- Data regarding the diagnosis of early graft dysfunction and renal allograft doppler ultrasound results and its parameters were collected and analyzed.



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RESULTS

- 450 patients were included. 67 developed early graft dysfunction.
- Among the doppler ultrasound parameters analyzed, pulsatility index, with a cut-off of ≥ 1.95 , revealed a sensitivity of 60.61% and specificity of 71.96%.
- The receiver operating characteristic (ROC) area for the pulsatility index was 0.71, indicating a good discriminatory capacity.

Table 4. Summary diagnostic accuracy of doppler ultrasound parameters

	Pulsatility index % (95% CI), LR (95%CI)	Peak systolic velocity
Cut-off	≥ 1.95	≤ 73.95
Sensitivity	60.61 (55.99-65.04)	54.55 (41.81-66.86)
Specificity	71.96 (67.60-75.93)	61.42 (56.32-66.33)
PPV	27.40 (23.46-31.73)	19.67 (14.17-26.18)
NPV	91.28 (88.28-93.56)	88.64 (84.18-92.20)
Positive LR	2.16 (1.68-2.78)	1.41 (1.10-1.82)
Negative LR	0.55 (0.40-0.74)	0.74 (0.56-0.97)
Accuracy	70.27 (65.86-74.33)	60.40 (42.95-78.97)
ROC area (area, 95% CI)	0.71 (0.64-0.78)	0.56 (0.48-0.63)



RESULTS

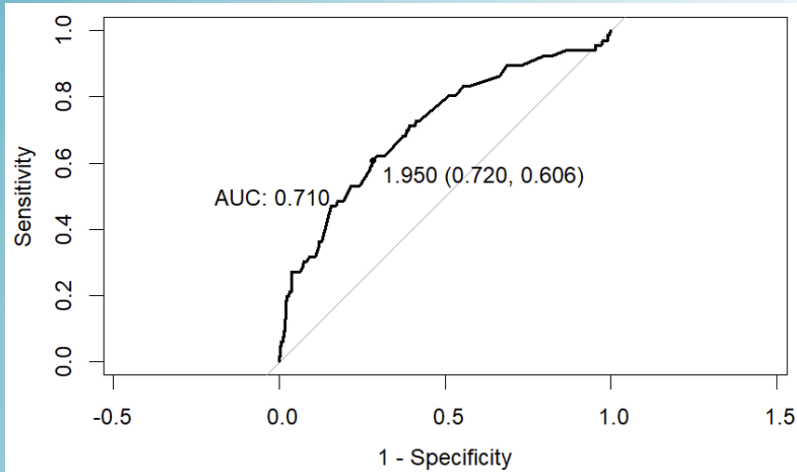


Figure 1. ROC graph of pulsatility index

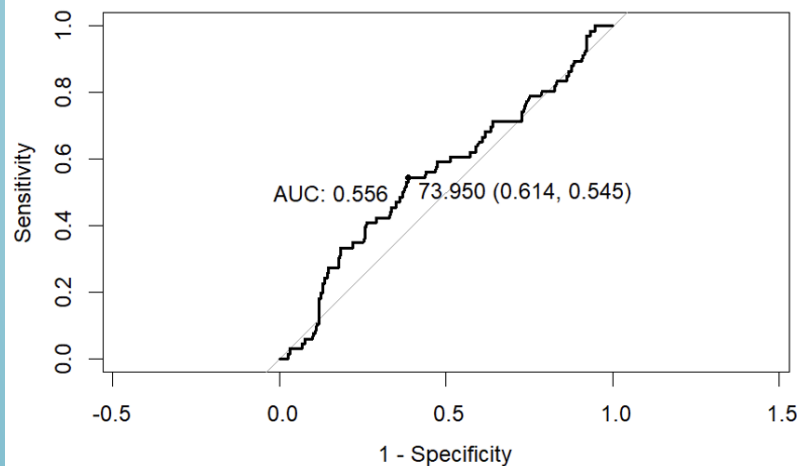


Figure 2. ROC graph of peak systolic velocity

- Peak systolic velocity, using a cut-off of ≤ 73.95 , manifested a sensitivity of 54.55% and specificity of 61.42%. Its NPV was considerable at 88.64%, yet its ROC area of 0.56 suggests moderate discriminating power.
- Overall, the pulsatility index appears to be a stronger diagnostic tool for early graft dysfunction.



- A baseline doppler ultrasound done post-transplantation is a helpful diagnostic tool.
- Among its parameters, an elevated pulsatility index correlates well in predicting early graft dysfunction.
- A larger prospective study will need to be performed to before its routine use can be recommended.

CONCLUSION



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