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## **Impact of sensitization and ABO blood group on access to deceased donor kidney transplantation with a long waiting time**

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**Objectives:** Although deceased donor kidney transplantation (DDKT) activity has markedly increased during the last 15 years in Korea, waiting time for DDKT is still very long. We aimed to investigate the impact of sensitization and blood group on accessibility to DDKT.

**Methods:** We retrospectively analyzed adult, waitlisted patients for DDKT from two tertiary hospitals between 2000 and 2021. The patients were classified into 3 groups based on the maximal % panel reactive antibody (PRA); <80%, 80≤<99%, and ≥99% or 2 groups as positive or negative PRA. Impact of PRA and ABO blood group on accessibility to DDKT was analyzed using Cox regression analysis.

**Results:** Among 4,740 waitlisted patients in the hospital-based cohort, 4,180 (88.2%), 412 (8.7%), and 148 (3.1%) patients belonged to <80%, 80≤<99%, and ≥99% PRA groups, respectively and only 828 (17.5%) patients received DDKT with a median waiting time of 12 years. Positive PRA has a lower opportunity to DDKT (HR 0.846, 95% CI 0.730-0.979). Compared to the PRA<80% group, higher PRA groups have a lower opportunity to DDKT (80≤<99%, HR 0.606, 95% CI 0.462-0.793; ≥99%, HR 0.390, 95% CI 0.237-0.642) after covariate adjustment. When we assessed DDKT accessibility according to combination of PRA and blood group, compared to low PRA <80% with blood group non-O, PRA <80% with blood group O and 80≤PRA<99% with blood group non-O had lower opportunities to DDKT (HR 0.634, 0.619). Moreover, 80≤PRA<99% with blood group O, PRA≥99% with blood group non-O, and PRA≥99% with blood group O had the lowest opportunities (HR 0.360, 0.347, 0.381).

**Conclusions:** High PRA and blood group O are significant barriers to DDKT accessibility, especially in areas with a long waiting time. Therefore, an integrated incentive system for PRA and ABO blood group is needed to reduce inequalities of DDKT opportunity.

Table2. Hazard ratio of receiving DDKT according to sensitization and ABO blood types.

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HR (95%CI)	Blood types				Total	p-value	
	non-O	p-value	O	p-value			
	Reference		0.634 (0.533-0.753)	<0.001	Reference		
PRA max	80-99%	0.619 (0.461-0.833)	0.001	0.360 (0.192-0.675)	0.001	0.584 (0.446-0.764)	<0.001
	99%-	0.347 (0.191-0.632)	<0.001	0.381 (0.158-0.920)	0.032	0.391 (0.237-0.643)	<0.001
	Total	Reference		0.638 (0.541-0.753)	<0.001		

Models are adjusted for age, sex, and DM.

Abbreviations: CI, confidence interval; DDKT, deceased donor kidney transplantation; HR, hazard ratio; PRA, panel reactive antibody.