

OUTCOMES OF DUAL KIDNEY TRANSPLANTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION

It is estimated 1.3-2.9 million Canadians have chronic kidney disease (CKD). The incidence of end-stage renal disease (ESRD) in Canada has steadily increased over the past 2 decades. Kidney transplantation remains the treatment of choice for all patients with ESRD. The increasing number of potential transplant recipients on waiting lists is not followed by an appropriate rise in the number of deceased donors.¹⁻³ There is now inclusion of expanded criteria donors (ECD) who have multiple comorbidities. ECD kidneys are those either from:

- Brain-dead donor ≥ 60 years of age
- A donor 50 to 59 years of age with at least two of the following features:
 - History of hypertension
 - Terminal serum creatinine > 133 mmol/L
 - Cerebrovascular cause of death

Even though there is progressive acceptance of ECD kidneys, in 2009, 44 % of ECD kidneys recovered in America were not transplanted leading to a high discard rate.^{4,7}

To decrease discard of marginal kidneys, a viable option is to allocate them for dual kidney transplantation (DKT). DKT poses a viable option for renal transplantation that may impact patient care in several ways including:

- Expansion of the donor pool
- Decreasing overall wait times
- Decreased cost of health care (Haemodialysis costs > Cost for renal transplantation)
- Improved patient quality of life

OBJECTIVES

To examine the feasibility and outcomes of DKT with respect to overall graft function and patient survival.

The outcome measures analyzed included:

- Cold ischemia time
- DGF in DKT compared to SKT
- Serum creatinine post transplant
- Graft survival
- Patient survival

METHODS

A systematic review and meta-analysis of the literature on DKTs was completed which included the utilization of Covidence software platform for systematic reviews, a detailed search of available literature by accessing major databases and individual searches with two independent investigators. The study population included adult patients with ESRD eligible for a kidney transplant. Inclusion Criteria: English language, patients who received dual kidney transplants, incidence of delayed graft function (DGF), one year graft survival, one year creatinine/estimated GFR (eGFR) and/or if they had a comparison single kidney transplant (SKT) group. Exclusion Criteria: Standard criteria transplants, insufficient follow up, case studies and/or other reviews of literature. The search strategy included the extensive review of major databases including Medline, Embase, PubMed, Cochrane Library and supplemental individual searches.

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses

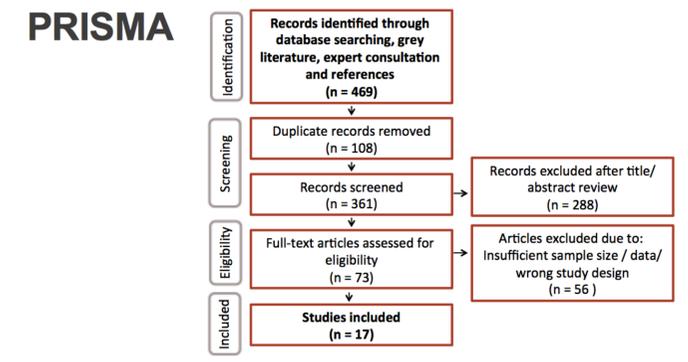
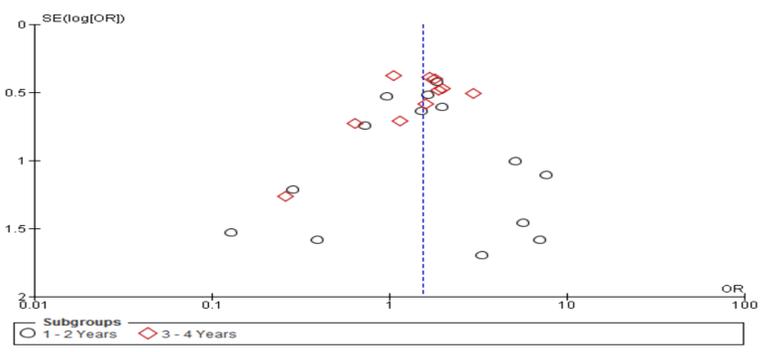


Figure 2. Results of DKT and SKT by variable

Variable	DKT	SKT
Patients	900	1554
Mean Follow-up (months)	40	41.5
Donor weighted mean age (SD)	68.4 (6.5)	62.1 (5.6)
Recipient weighted mean age (SD)	60.1 (5.5)	57.6 (7.9)
Weighted proportion of male donors	37.3	56.0
Weighted % of male recipients	65.7	54.4
Weighted Mean CIT (SD)	19.5 (3.5)	21.7 (6.0)
Weighted % of DGF	30.31	32.1

Figure 3. Funnel Plot of included studies. Funnel plot showing there was not a large publication bias as the distribution is symmetric (Black circles representing subgroup 1-2 years; Red Circles representing subgroup 3-4 years)



RESULTS

Figure 4. Forrest plots for graft survival, patient survival and serum creatinine at 1 year. A. Graft survival after 1 year was greater in DKT vs SKT (pooled OR = 1.64, 95% CI 1.10-2.45, p = 0.02). B. Patient survival after 1 year Patient survival not statistically significantly different in the two groups (OR = 1.34, 95% CI 0.72 – 2.49, p = 0.36). C. Serum creatinine after 1 year was significantly lower in DKT (Mean difference = -0.35, CI -0.54 – -0.17, p = 0.0002).

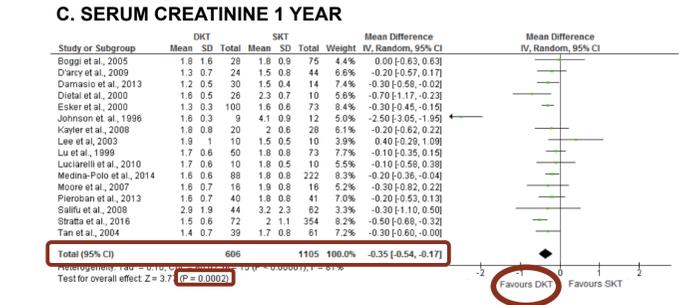
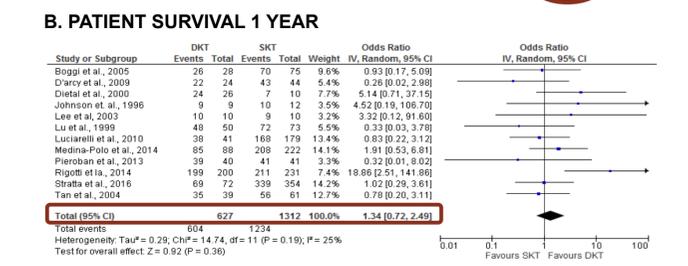
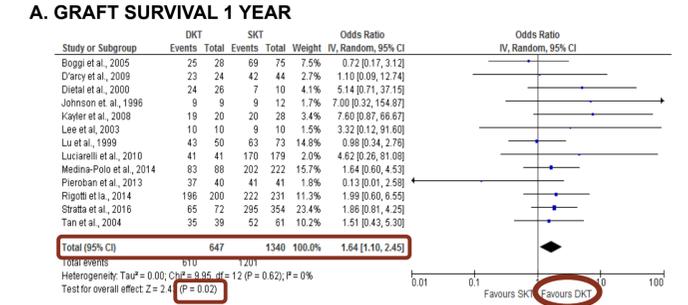
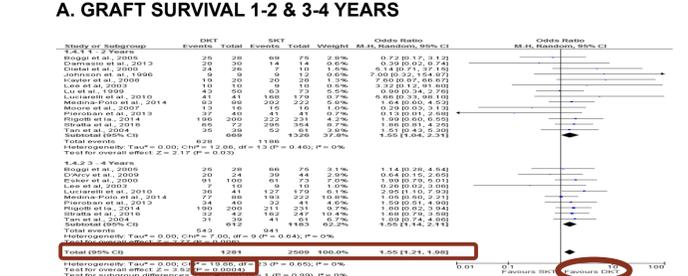
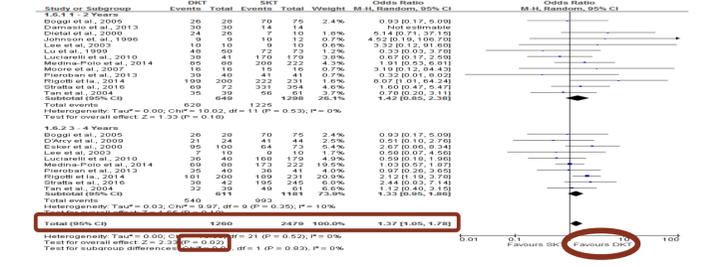


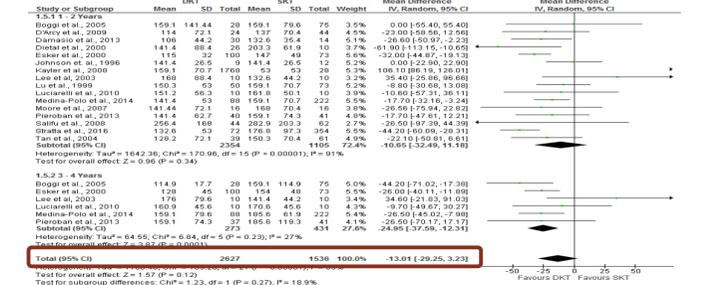
Figure 5. Forrest plot for subgroup analysis. A. Graft survival after 1-2 and 3-4 years was significantly greater in the DKT group (OR = 1.55, 95% CI 1.21 – 1.98, p = 0.0004). B. Patient survival after 1-2 and 3-4 years was significantly greater in the DKT group (OR = 1.37, 95% CI 1.05 – 1.78, p = 0.02). C. Serum creatinine after 1-2 and 3-4 years was not significantly different (Mean difference = -13.01, 95% CI 29.25 – 3.23, p = 0.12).



B. PATIENT SURVIVAL 1-2 & 3-4 YEARS



C. SERUM CREATININE 1-2 & 3-4 YEARS



CONCLUSIONS

DKT has greater rates of graft survival and comparable patient survival rates compared to SKT. These results support that DKT is a safe and feasible option for expanded organ donation criteria and may be considered for select patient populations.

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DISCLOSURES: NONE