

Association between early resistive index measurement and early graft function and long term graft survival after kidney transplantation: an evidence-based clinical review

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Abstrak

ABSTRACT

Background: resistive index (RI) is highly utilised to assess the graft function using Doppler ultrasonography. The RI has been shown as the best ultrasound parameter to assess kidney allograft dysfunction. Several studies have established the role of the RI as a predictor of transplant failure. However, these studies were using RI measurement in the later stages post transplantation. The present study has conducted to identify the association between early RI measurement and early graft function represented as delayed graft function (DGF) and immediate graft function (IGF), as well as long-term graft survival. Methods: an evidence based clinical review of studies published before May 2018 was conducted from Medline, Science Direct, EMBASE and Cochrane databases. Studies on early measurement of RI whereby the primary or secondary goals of the study related to graft function and/or graft survival were included. Studies using late RI measurement and without RI value groups were excluded. The Mantel Haenszel method was used to analyse pooled risk ratio and 95% confidence interval, while the heterogeneity of the study was calculated through I² value. Data analysis was performed using Review Manager 5.3. Results: nine studies with a total of 1802 patients who had undergone a kidney transplant were analysed. DGF was found in 19% (193/1015) of the low RI group and in 42.8% (337/787) of the high RI group (RR 2.04 (95% CI 1.72 - 2.41), $p < 0.00001$, I² = 28%). IGF was found in 39.5% (62/157) of the low RI group and in 10.5% (28/268) of the high RI group (RR 0.26 (95% CI 0.17 - 0.40), $p < 0.00001$, I² = 0%). Long term graft survival, with follow up between 60-144 months, was found in 83% (701/845) of the low RI group and in 69.4% (395/569) of the high RI group (RR 0.82 (95% CI 0.72 - 0.93), $p = 0.002$, I² = 63%). Conclusion: the results of this study emphasise the association between early measurement of RI and early graft function, and longterm graft survival. An elevated RI provides the chance of recognizing the patients with poor longterm prognosis, from the first moment after kidney transplant.