

A single-center, pilot, clinical study of hypothermic oxygenated machine perfusion with or without adsorption in histologically evaluated kidneys from marginal donors.

Federica Tomatis MD¹, Camillo Carrara MD¹, Giuseppe Remuzzi MD, FRCP² and Piero Ruggenti MD^{1,2}

¹Unit of Nephrology and Dialysis, Azienda Socio-Sanitaria Territoriale Papa Giovanni XXIII, Bergamo

²Clinical Research Center for Rare Diseases "Aldo e Cele Daccò", Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Bergamo



XXIII Ospedale di Bergamo

Regione Lombardia
ASST Papa Giovanni XXIII

Background

The use of kidneys from marginal donors (i.e., older donors or donors with hypertension, diabetes and/or nonnephrotic proteinuria) increased donors pool and transplant activity, but also the risk of delayed graft function (DGF) and premature graft failure. Pre-transplant machine perfusion (MP) has been found to reduce the incidence of DGF and improve short-term graft survival, as compared to cold storage. The aim of our study is to investigate whether pre-transplant hypothermic oxygenated machine perfusion (HOPE) - with or without concomitant adsorption – of histologically evaluated kidneys from marginal donors modifies biochemical and molecular markers that may mediate ischemia-reperfusion damage to the graft and adversely affect short- and long-term graft outcomes.

Methods

Patients eligible to single or dual transplantation with histologically evaluated kidneys from marginal donors will be allocated to either HOPE with adsorption or HOPE without adsorption in a 1:1 ratio. MP will be delivered by PerLife™ PerKidney™ system (Aferetica) with the use of CytoSorb cartridge, when needed. Physical perfusion parameters and perfusate samples will be collected throughout the entire perfusion period. Biochemical and molecular markers of kidney function, acute kidney injury, inflammation and ischemia/reperfusion damage will be evaluated.

Results

On the basis of the available experience, we expect that pre-transplant treatment of kidneys from marginal donors with HOPE with concomitant adsorption will reduce the burden of inflammation, acute kidney injury and ischemia/reperfusion damage to the graft as compared to HOPE without adsorption.

Conclusion

The study findings are expected to show that adsorption associated with HOPE will ameliorate markers of ischemia/reperfusion damage of grafts from marginal donors as compared to HOPE without adsorption. The benefits of HOPE-associated adsorption are expected to translate into improved short- and long-term outcomes of transplants of histologically evaluated kidneys from marginal donors. Whether this will apply more in general to kidneys from expanded criteria donors will be worth investigating.