In Person + Live Streaming
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17β-estradiol and methylprednisolone treatment during isolated kidney perfusion has beneficial effects in brain dead females but not in male rats

Vidal-dos-Santos M, Armstrong-Jr R, Ottens PJ, Anunciação LF, Correia CJ, Moreira LFP,

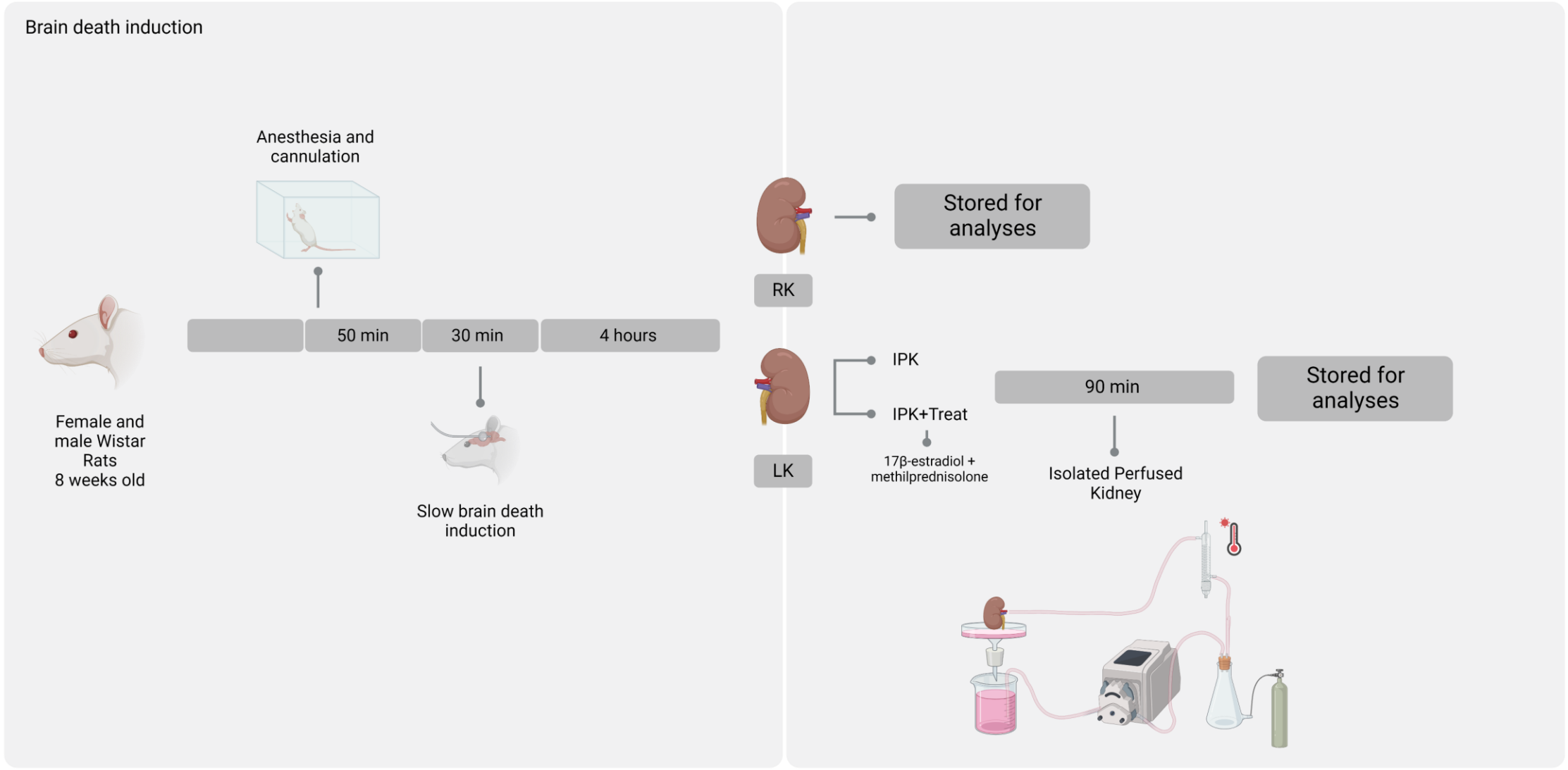
Leuvenink HGD, Breithaupt-Faloppa AC

Introduction

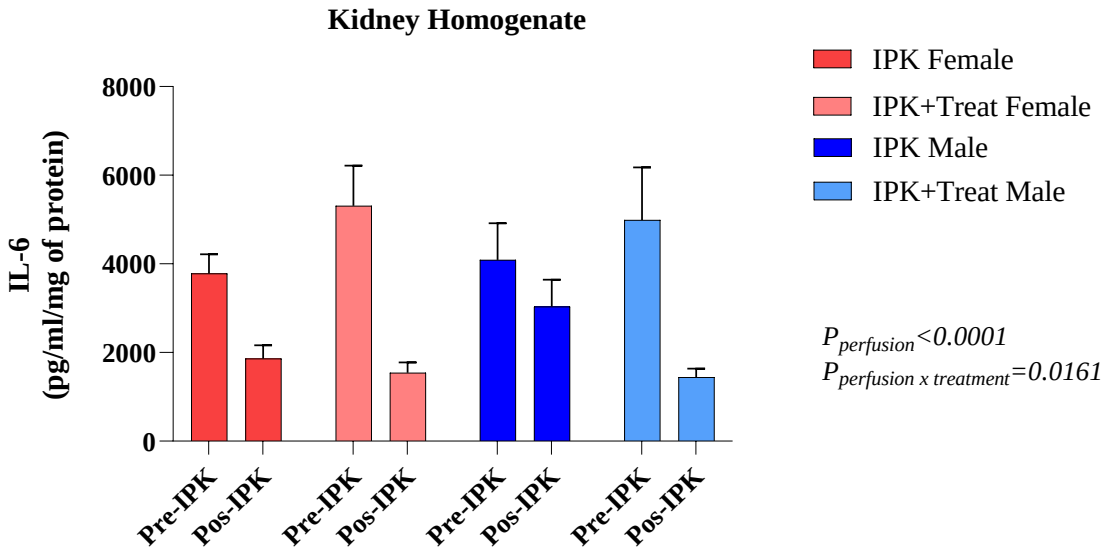
- Donation after brain death (BD) is still the main source of organs for transplant and several strategies have been developed to improve organ quality.
- Machine perfusion is a tool to assess function and allows organs to be treated before transplantation.
- The use of hormonal replacement in the donor is common practice with positive results.

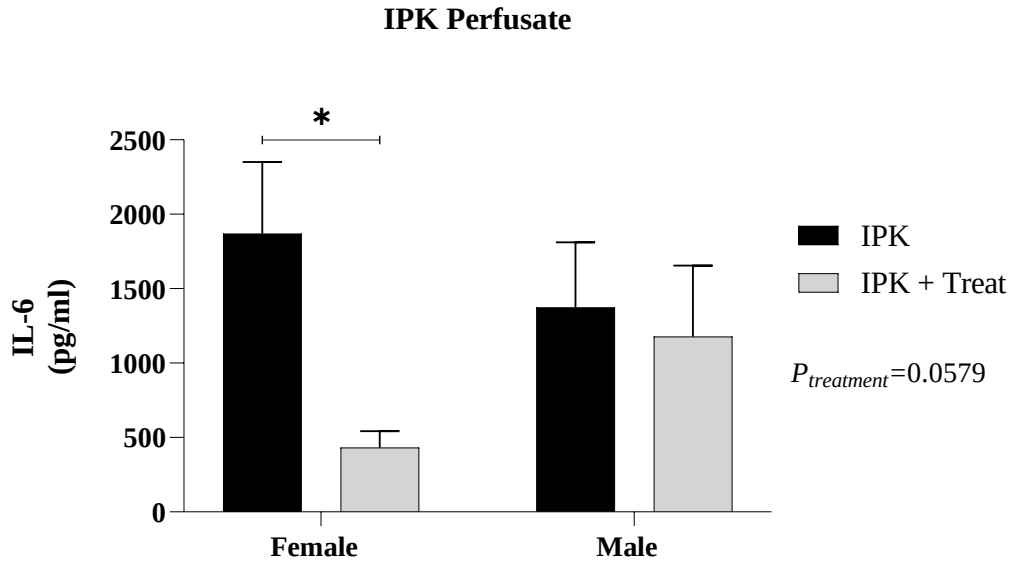
Our aim was to investigate the use of combined administration of methylprednisolone (MP) and 17β-estradiol (E2) during isolated kidney perfusion (IPK) in BD animals.

Methods

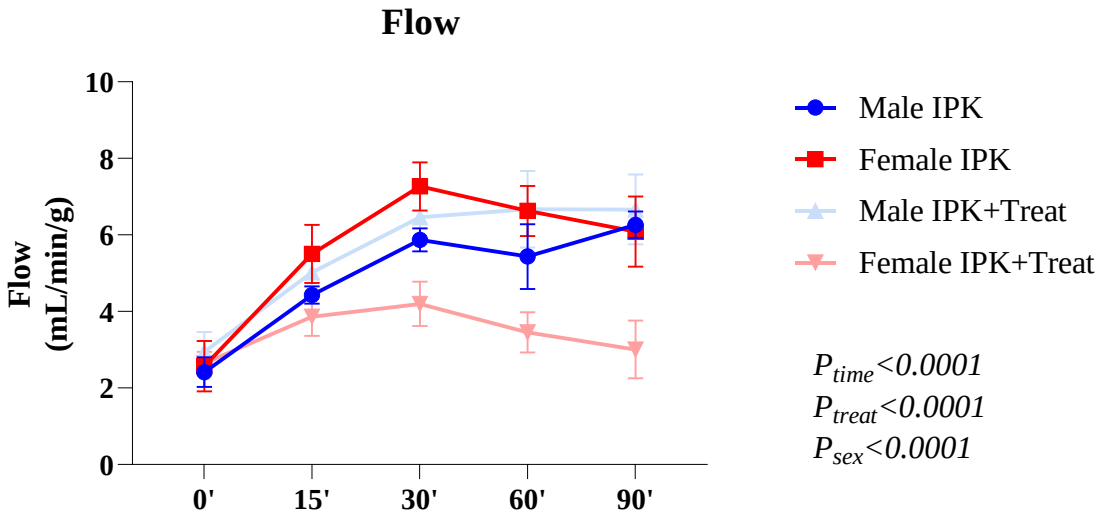

Brain death induction
Anesthesia and cannulation
Female and male Wistar Rats 8 weeks old
50 min
30 min
4 hours
Slow brain death induction
RK
Stored for analyses
LK
IPK
IPK+Treat
17β-estradiol + methilprednisolone
90 min
Isolated Perfused Kidney
Stored for analyses

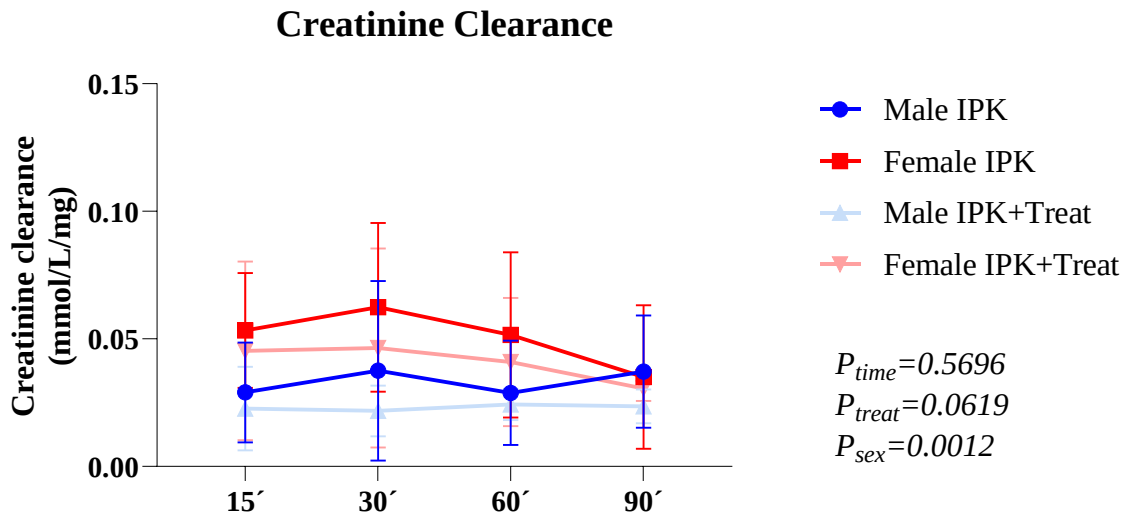
Results


Kidney Homogenate
IL-6 (pg/ml/mg of protein)
8000
6000
4000
2000
0
Pre-IPK
Pos-IPK
Pre-IPK
Pos-IPK
Pre-IPK
Pos-IPK
Pre-IPK
Pos-IPK
IPK Female
IPK+Treat Female
IPK Male
IPK+Treat Male
$P_{perfusion}<0.0001$
$P_{perfusion\ x\ treatment}=0.0161$

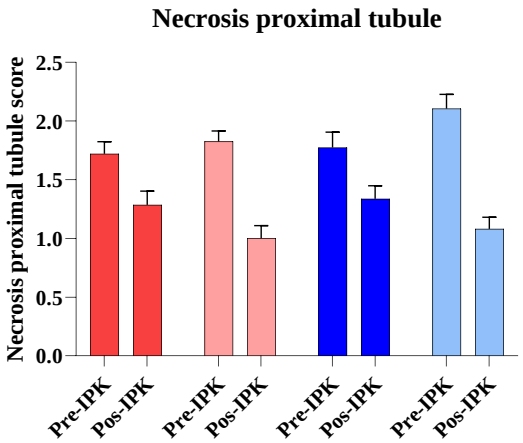

IPK Perfusate
*
IL-6 (pg/ml)
2500
2000
1500
1000
500
0
Female
Male
IPK
IPK + Treat
$P_{treatment}=0.0579$

Results


Flow
Flow (mL/min/g)
10
8
6
4
2
0
0'
15'
30'
60'
90'
Male IPK
Female IPK
Male IPK+Treat
Female IPK+Treat
$P_{time}<0.0001$
$P_{treat}<0.0001$
$P_{sex}<0.0001$

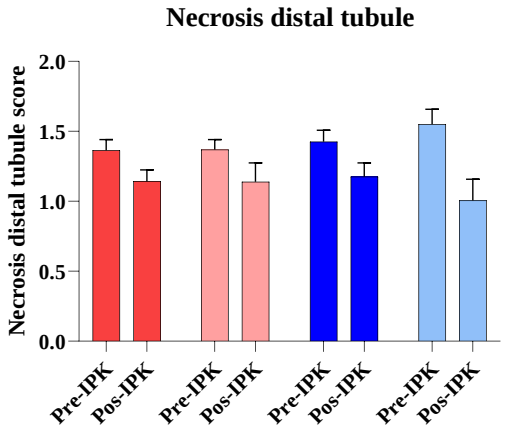

Creatinine Clearance
Creatinine clearance (mmol/L/mg)
0.15
0.10
0.05
0.00
15´
30´
60´
90´
Male IPK
Female IPK
Male IPK+Treat
Female IPK+Treat
$P_{time}=0.5696$
$P_{treat}=0.0619$
$P_{sex}=0.0012$

Results



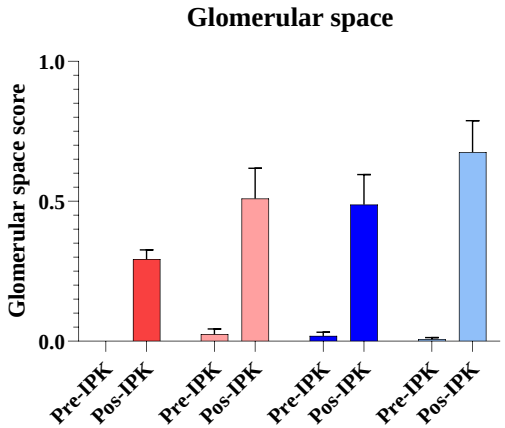
Female IPK
Female IPK+Treat
Male IPK
Male IPK+Treat

$P_{perfusion}<0.0001$
$P_{treat}=0.7382$
$P_{sex}=0.1441$



Female IPK
Female IPK+Treat
Male IPK
Male IPK+Treat

$P_{perfusion}=0.0001$
$P_{treat}=0.6385$
$P_{sex}=0.8857$



Female IPK
Female IPK+Treat
Male IPK
Male IPK+Treat

$P_{perfusion}<0.0001$
$P_{treat}=0.0781$
$P_{sex}=0.0423$

Conclusion

Our data point to an improvement on renal inflammation after IPK, specially on the female treated group, marked by the reduction of IL-6 in perfusate samples.

These results could suggest that the associated treatment of MP and E2 is beneficial to female subjects and could arise as a treatment strategy to improve organ quality during kidney perfusion.