ENDOTOXEMIA: A NOVEL RISK FACTOR IN SYSTEMIC INFLAMMATION AND ENDOTHELIAL DYSFUNCTION IN KIDNEY TRANSPLANT RECIPIENTS

Winnie Chan[1,2], Anna Phillips[2], Jos Bosch[3], David Jones[4], Okdeep Kaur[1], Philip McTernan[5], Richard Borrows[1]

[1]University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK; [2]University of Birmingham, Birmingham, UK; [3]University of Amsterdam, Amsterdam, Netherlands; [4]Manchester Metropolitan University, Manchester, UK; [5]University of Warwick, Coventry UK.

BACKGROUND

- Cardiovascular disease is the leading cause of death in kidney transplant recipients (KTRs).
- Prevalence of traditional cardiovascular risk factors cannot fully justify the increased incidence of cardiovascular events in KTRs.
- Several studies have highlighted potential contributors of such unconventional phenotypes as inflammation and endothelial dysfunction.
- Potential stimuli of inflammation and endothelial dysfunction in KTRs, namely circulating endotoxin and adiponectin, remain unexplored.

OBJECTIVES

- To investigate the predictors of inflammation and endothelial dysfunction in a prevalent cohort of KTRs.
- To dissect the relationship between inflammation and endothelial dysfunction.

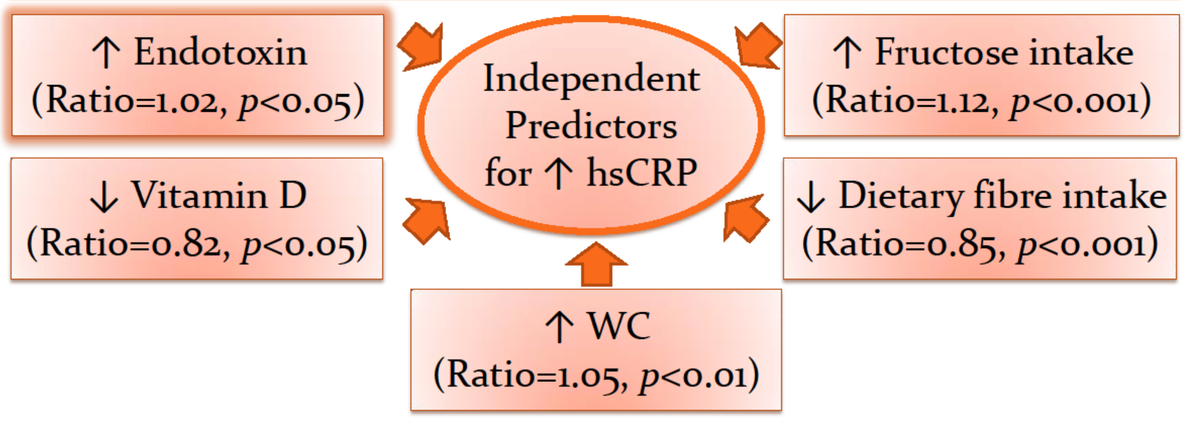
METHODS

- This single-centre cross-sectional study enrolled KTRs who were at least 1 year post transplantation.
- Fasting serum samples were collected for measurements of:
  - High-sensitivity c-reactive protein (hsCRP)
  - sE-selectin
  - Endotoxin
  - Adiponectin
  - Uric acid
  - 25-Hydroxyvitamin D (vitamin D)
  - Full lipid-profile: total cholesterol; triglycerides; high-density lipoprotein (HDL); low-density lipoprotein (LDL)
  - Estimated glomerular filtration rate (eGFR)
- Dietary intakes of energy, fructose, fibre, and total fat were determined by 3-day food diary.
- Body composition including fat tissue index, lean tissue index and fluid volume status was measured using bio-impedance based body composition monitor.
- Central obesity was assessed using waist circumference (WC).
- Systolic and diastolic blood pressure were measured, with mean arterial pressure (MAP) calculated.
- Demographic, nutritional and clinical predictors for markers of inflammation (hsCRP) and endothelial dysfunction (sE-selectin) were assessed using univariate and multivariate regression analyses.

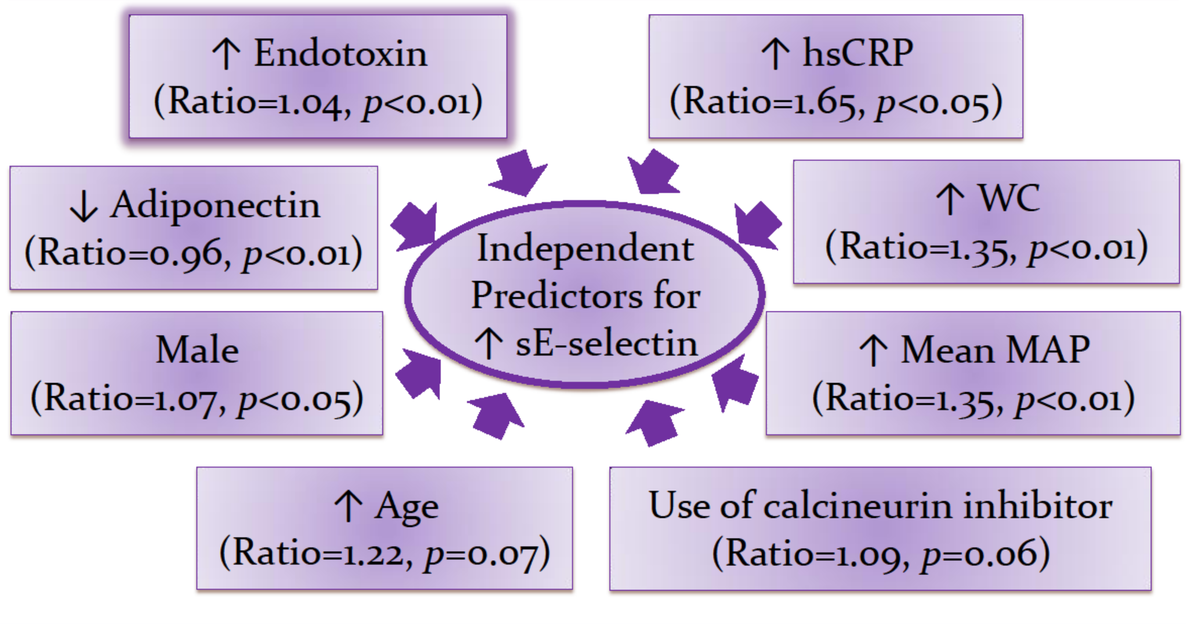
RESULTS

Population Characteristics	
Sample size	n = 128
Gender	56% male
Mean age	49 ± 15 years
Median time post-transplantation	4 (2-11) years
Mean eGFR	45 ± 18 mL/min
Use of calcineurin inhibitors	91%
Median hsCRP	2.47 (1.00-4.89) mg/L
Median sE-selectin	34.2 (24.1-44.8) ng/mL
Median endotoxin	1.95 (1.49-2.38) EU/mL
Median vitamin D	42 (20-64) nmol/L
Median adiponectin	10.25 (6.24-13.82) µg/mL
Mean MAP	101 ± 11 mmHg
Mean WC	97.8 ± 16.8 cm
Median fructose intake	16.9 (9.0-26.7) g
Median dietary fibre intake	15.8 (12.0-20.9) g

Predictors of Inflammation in Prevalent KTRs



Predictors of Endothelial Dysfunction in Prevalent KTRs



CONCLUSIONS

- **Endotoxemia in KTRs is a key component in contributing to both systemic inflammation and endothelial dysfunction.**
- **Targeting endotoxemia may serve as a potent upstream intervention for endothelial dysfunction in KTRs, thereby improving cardiovascular outcome in this population.**

ACKLOWLEDGEMENT: *Winnie Chan was awarded a PhD Research Training Fellowship from the NHS West Midlands Strategic Health Authority, and received a research grant from the British Renal Society.*

DOI: 10.3252/pso.eu.52era.2015