

# DIETARY FRUCTOSE: A NEW PARADIGM IN PREDICTING METABOLIC PROFILE IN KIDNEY TRANSPLANT RECIPIENTS

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## BACKGROUND

- Fructose is a monosaccharide found in fruits, vegetables and honey.
- Widely used as an industrial sweetener in food and beverages, fructose intake has increased markedly over the past century.
- Findings from pre-clinical studies and non-transplantation chronic kidney disease population suggested that fructose intake may be associated with:
  - Declined renal function
  - Inflammation
  - Deranged metabolic syndrome
  - Endothelial dysfunction
  - Hyperuricemia
- Such associations have not been explored in kidney transplant recipients (KTRs).

## OBJECTIVES

- Investigate the impact of fructose intake among clinically stable KTRs on:
  - metabolic syndrome and its individual components
  - hyperuricemia
  - inflammation
  - endothelial dysfunction
  - renal function

## METHODS

- This single-centre cross-sectional study enrolled 128 clinically stable KTRs who were at least 1 year after kidney transplantation.
- Fructose intake was estimated by a 3-day food diary.
- Fasting serum samples were collected for measurements of estimated glomerular filtration rate (eGFR), triglycerides, high-density lipoprotein (HDL), glucose, urate, high-sensitivity c-reactive protein (hsCRP), and sE-selectin.
- Waist circumference (WC) was measured with a non-stretchable standard tape measure.
- Systolic and diastolic blood pressure (SBP and DBP) were measured semi-recumbent with a fully automatic upper-arm digital blood pressure monitor.
- Metabolic syndrome was defined using the International Diabetes Federation diagnostic criteria.

### International Diabetes Federation Diagnostic Criteria

#### Central obesity:

- Waist circumference > 94cm for male and > 80cm for female

#### Plus 2 other risk factors including:

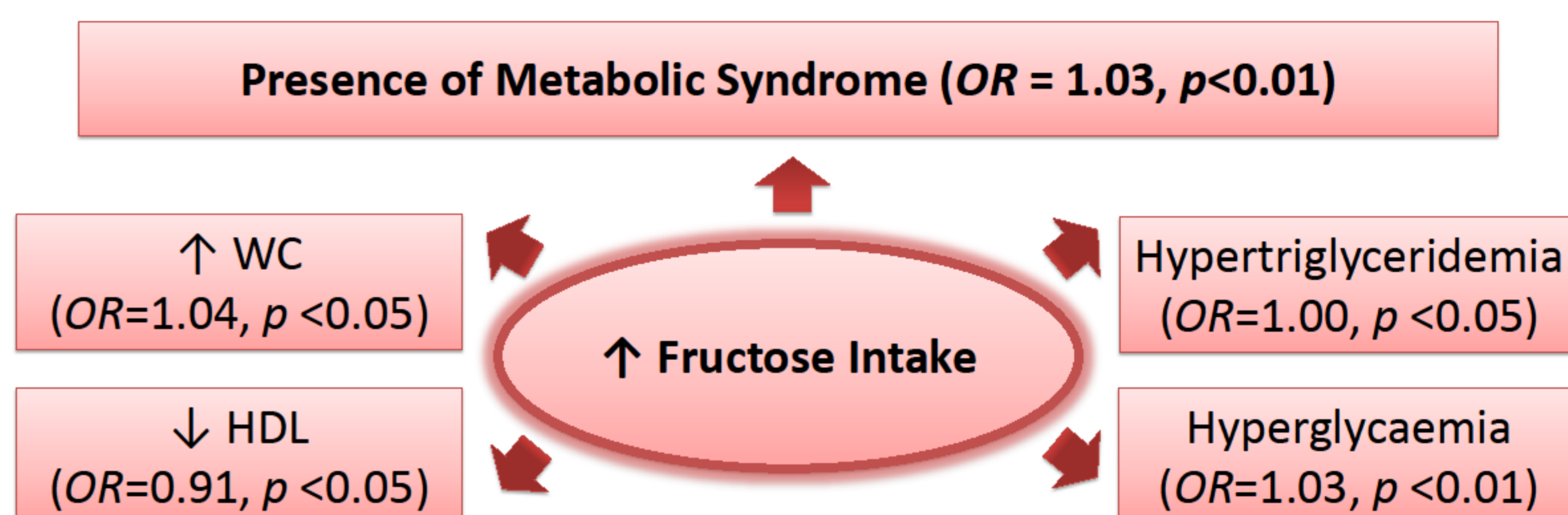
- Hypertriglyceridemia ( $\geq 1.7$ mmol/L)
- Decreased HDL ( $< 1.03$  mmol/L for male and  $< 1.29$ mmol/L for female)
- Elevated blood pressure (systolic  $\geq 130$ mmHg and diastolic  $\geq 85$ mmHg)
- Increased fasting glucose ( $\geq 5.6$ mmol/L)

- Regression analyses were used to determine the associations between fructose intake and different clinical parameters.

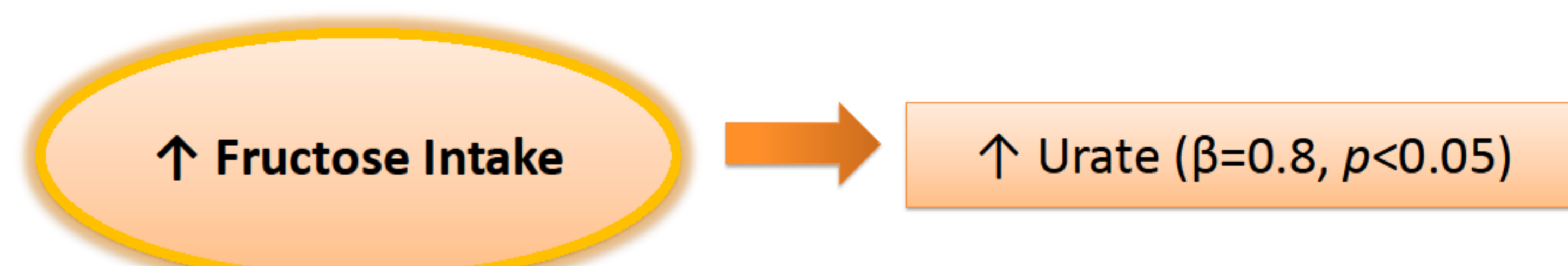
## RESULTS

Population Characteristics	
Sample size	n = 128
Mean age	49 $\pm$ 15 years
Gender	56 % male
Median time post-transplantation	4 (2-11) years
Median fructose intake	16.9 (9.0-26.7) g
Mean eGFR	45 $\pm$ 18 mL/min
Median triglycerides	1.48 (0.94-2.15) mmol/L
Median HDL	1.53 (1.17-1.87) mmol/L
Mean glucose	5.4 (4.8-6.7) mmol/L
Mean urate	420 $\pm$ 100 $\mu$ mol/L
Median hsCRP	2.47 (1.00-4.89) mg/L
Median sE-selectin	34.2 (24.1-44.8) ng/mL
Mean WC	97.8 $\pm$ 16.8 cm
Mean SBP / Mean DBP	140 $\pm$ 19 / 80 $\pm$ 11 mmHg

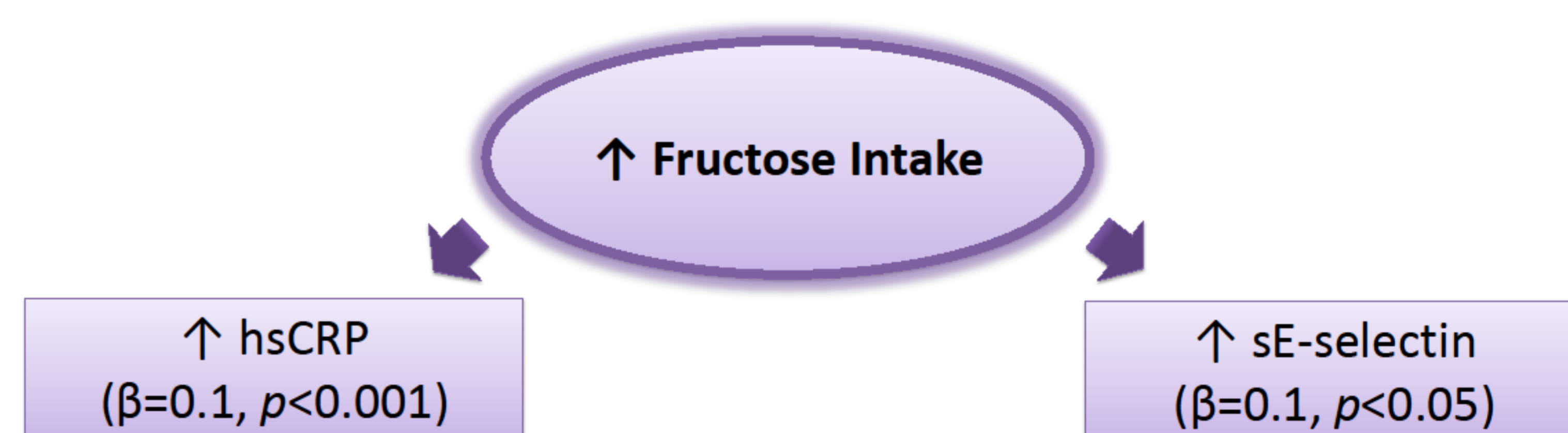
### Impact of Fructose Intake on Metabolic Syndrome



### Impact of Fructose Intake on Urate Level



### Impact of Fructose Intake on Inflammation & Endothelial Function



### Association between Fructose Intake and Renal Function



## CONCLUSIONS

- Fructose consumption is highly associated with deranged metabolic profile, inflammation and endothelial dysfunction in KTRs irrespective of renal function.
- Targeting fructose intake may service as a novel intervention to improve cardio-metabolic risk profile and ultimately cardiovascular mortality in KTRs.

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