Chronic binge alcohol & gonadal hormonal loss impair glucose-insulin dynamics in SIV-infected female rhesus macaques

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Background

- There are 38 million people living with HIV (PLWH) in the U.S.
- In spite of viral control with antiretroviral therapy (ART), PLWH have an increased risk of chronic conditions.
- Prevalence of alcohol use disorders (AUD) is higher among PLWH compared to the general population.
- Previous studies in our lab have shown that chronic binge alcohol (CBA) leads to metabolic dysregulation in male rhesus macaques, but pancreatic integrity remains to be investigated.
- Our aim was to determine the impact of CBA and gonadal hormone loss (OVX) on glucose-insulin parameters and pancreatic integrity in female rhesus macaques.

Methods

- Experimental Timeline, 14.5 months
- VEH/ALC (2.5 g/kg 30 minutes daily; peak BAC 50-60 mM)
- SIV infection
- ART
- 2.5 mos
- ± OVX
- 8 mos

Frequently sampled intravenous glucose tolerance test (FSIVGTT)

Blood glucose measured with a glucometer
Serum insulin measured with an ELISA kit

MINMOD analysis
Disposition index (DI)

Acute insulin response to glucose (AIRg)
Insulin sensitivity (Si)
Glucose effectiveness (Sg)

Immunohistochemistry of formalin-fixed, paraffin-embedded pancreatic tissue
- Novus mouse anti-insulin (1:1000) ➔ Goat anti-mouse 568 (1:1000)
- CST rabbit anti-glucagon (1:1000) ➔ Goat anti-rabbit 488 (1:1000)

Results

- Chronic binge alcohol
  - ↓ the acute insulin response to glucose
  - does not alter basal pancreatic insulin or glucagon expression
- Gonadal hormone loss alters insulin and glucose levels as determined by FSIVGTT

Summary

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