Analysis of Inflammatory Markers in Response to Induction of Reprometabolic Syndrome by a Eucaloric High Fat Diet in Normal Weight Women. Thy Nguyen (MD Candidate, School of Medicine), Katherine Kuhn, Shannon Pretzel, Andrew P. Bradford, and Nannette Santoro. Department of Obstetrics & Gynecology, University of Colorado Anschutz Medical Campus, Aurora, CO.

Obesity in women is associated with decreased fertility and relative hypogonadotropic hypogonadism, which we term Reprometabolic Syndrome. We have shown that decreases in LH and FSH levels and impaired response to GnRH observed in women with obesity can be recapitulated in normal weight women (NWW) by administration of a one-month eucaloric high fat diet (HFD). We examined the impact of the HFD on serum levels of a comprehensive panel of inflammatory markers.

19 healthy, eumenorrheic, NWW underwent a frequent blood sampling study in the early follicular phase, before and after consumption of a prescribed, eucaloric HFD for the duration of their menstrual cycle. Serum samples were pooled and analyzed for a panel of markers of inflammation using immunoassay. Differences between control and HFD were analyzed by paired t-test.

A small but significant increase in the anti-inflammatory cytokine IL-10 ($p=0.04$) was observed in response to the HFD. Eotaxin ($p=0.05$), IL-6, MIP-1β and IL-1α also increased ($p = 0.07$). There were no significant differences in levels of CRP or any other cytokines, interleukins, and chemokines tested.

Induction of the Reprometabolic Syndrome was associated with a significant elevation in IL-10, which may represent a counterregulatory response to the HFD. We also observed marginally significant increased eotaxin, IL-6, MIP-1-beta and IL-1-alpha. These findings argue against chronic inflammation as a primary mediator of Reprometabolic Syndrome and suggest that further attention should be paid to the impact of circulating lipids and dietary factors on the hypothalamic-pituitary-gonadal axis.

Table 1. Changes in cytokines, interleukins, and chemokines in NWW in response to the HFD. Data are mean (95% confidence intervals) differences between control and HFD of 19 participants analyzed by paired t-test.

Serum Analyte	n	Mean Change	CI	p value
Eotaxin	**19**	**15.26 pg/mL**	**(-0.31, 30.82)**	**0.05**
Eotaxin-3	19	0.5 pg/mL	(-0.75, 1.75)	0.41
IFN-γ	19	0.99 pg/mL	(-7.85, 9.83)	0.82
IL-10	**19**	**0.05 pg/mL**	**(0, 0.1)**	**0.04**
IL-12p70	14	-0.01 pg/mL	(-0.18, 0.16)	0.91
IL-13	12	0.49 pg/mL	(-0.3, 1.27)	0.2
IL-1β	18	0.1 pg/mL	(-0.07, 0.28)	0.23
IL-2	16	0 pg/mL	(-0.09, 0.09)	0.98
IL-4	4	0.01 pg/mL	(0, 0.02)	0.13
IL-6	**19**	**0.32 pg/mL**	**(-0.03, 0.68)**	**0.07**
IL-8	19	78.88 pg/mL	(-30.33, 188.09)	0.15
IL-8 (HA)	11	140.71 pg/mL	(-73.53, 354.95)	0.17
IP-10	19	-0.07 pg/mL	(-28.37, 28.22)	1
MCP-1	19	8.87 pg/mL	(-6.09, 23.82)	0.23
MCP-4	19	8.95 pg/mL	(-2.29, 20.18)	0.11
MDC	19	-33.14 pg/mL	(-92.92, 26.63)	0.26
MIP-1α	16	4.27 pg/mL	(-2.05, 10.59)	0.17
MIP-1β	**19**	**13.92 pg/mL**	**(-1.42, 29.26)**	**0.07**
TARC	19	12.81 pg/mL	(-8.34, 33.96)	0.22
TNF-α	19	0.09 pg/mL	(-0.05, 0.22)	0.18
GM-CSF	12	-0.08 pg/mL	(-0.19, 0.02)	0.1
IL-12/23p40	19	-6.45 pg/mL	(-21.51, 8.61)	0.38
IL-15	19	0.05 pg/mL	(-0.11, 0.22)	0.52
IL-16	19	44.4 pg/mL	(-177.98, 266.79)	0.68
IL-17A	19	0.09 pg/mL	(-0.36, 0.54)	0.67
IL-1α	**19**	**0.71 pg/mL**	**(-0.07, 1.5)**	**0.07**
IL-5	19	-0.07 pg/mL	(-0.28, 0.13)	0.46
IL-7	19	0.14 pg/mL	(-0.91, 1.19)	0.79
TNF-β	9	-0.04 pg/mL	(-0.28, 0.2)	0.71
VEGF	19	12.91 pg/mL	(-9.89, 35.72)	0.2