

The association between fasting times and metabolic and inflammatory biomarkers in the Inflammation Management Intervention (IMAGINE)

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Objective: To examine the association between fasting times and metabolic and inflammatory biomarkers.



- **Methods:**

- A self-selection trial (IMAGINE).

intervention (intervention: n = 61, in-person classes for 3 months)

control condition (control: n = 34, newsletters for 3 months)

- Timing of dietary intake was assessed via three unannounced 24-h dietary recalls at both baseline and three months.

- Calculate fasting times : $24 - (\text{average last consumption} - \text{average first consumption})$.

- Lipids and inflammatory biomarkers were assessed via blood draws at both timepoints.

- Linear mixed model analyses.

- Results :

Table 1: Adjusted means of Lipid Biomarkers by fasting time^a

Outcome	Fasting time Tertile 1	Fasting time Tertile 2	Fasting time Tertile 3	P: 1 vs 3	β cont	P: Cont
CRP (mg/L) *	3.43	3.41	3.56	0.84	0.00	0.77
IL6 (pg/mL)	1.46	1.51	1.87	0.04	0.00	0.15
TNF-alpha (pg/mL) *	0.71	0.58	0.62	0.26	0.00	0.35
Cholesterol (mg/dL)	175.22	186.35	188.86	0.04	0.04	0.06
HDL (mg/dL)	54.40	55.38	55.52	0.54	0.00	0.54
LDL (mg/dL)	109.12	99.80	119.69	0.47	0.04	0.04
Triglycerides (mg/dL)	94.66	98.24	135.51	0.14	0.00	0.98
Insulin (mU/L)	8.30	9.64	10.69	0.01	0.01	0.04
Glucose (g/d)	101.56	101.89	102.22	0.90	0.01	0.56

*P values for fasting time by timepoint interaction for CRP and TNF- α are 0.0325 and 0.0235 respectively..

Table 2: Adjusted means of Lipid Biomarkers by first meal time^a

Outcome	First mealtime Tertile 1	First mealtime Tertile 2	First mealtime Tertile 3	P: 1 vs 3	β cont	P: Cont
CRP (mg/L) *	3.77	2.93	3.65	0.79	0.00	0.13
IL6 (pg/mL)	1.61	1.49	1.71	0.63	0.00	0.29
TNF-alpha (pg/mL) *	0.71	0.61	0.64	0.42	0.00	0.76
Cholesterol (mg/dL)	179.90	185.32	185.11	0.41	0.05	0.09
HDL (mg/dL)	51.06	53.83	51.84	0.67	0.00	0.74
LDL (mg/dL)	97.09	102.83	106.90	0.05	0.07	0.01
Triglycerides (mg/dL)	112.61	107.96	108.66	0.79	0.03	0.63
Insulin (mU/L)	9.29	10.16	10.42	0.20	0.00	0.37
Glucose (g/d)	104.18	98.45	102.73	0.77	0.02	0.41

*P values for first mealtime by timepoint interaction for CRP and TNF- α are 0.0277 and 0.0122 respectively..

Discussion :

- Longer fasting times are associated with higher CRP, TNF- α , IL6 cholesterol, LDL, and insulin.
- Eating breakfast late may be related to longer fasting time.
- It may be difficult to study fasting in observational studies especially if people have unhealthy eating behaviors such as skipping breakfast.