**Changes in micronutrient and inflammation serum biomarker concentrations after a norovirus human challenge, by Williams AM et al.**

**Supplemental Table 1: Baseline characteristics of norovirus challenge subjects stratified by infection status (n=51)1**

|  |  |  |
| --- | --- | --- |
|   | Uninfected(n=26) | Infected(n=25) |
| *Demographics* |  |  |
|  Age (yr) | 25 (21, 27) | 25 (21, 28) |
|  Female | 54%  | 60% |
| *Inflammation* |  |  |
|  C-reactive protein (mg/L) | 1.04 (0.53, 1.72) | 0.79 (0.50, 1.78) |
|  alpha-1-acid glycoprotein (g/L) | 0.64 (0.47, 0.75) | 0.56 (0.44, 0.68) |
| *Nutrition* |  |  |
|  Ferritin (µg/L) | 58.3 (23.4, 100.6) | 56.6 (29.8, 98.2) |
|  Hepcidin (ng/mL) | 9.4 (1.7, 21.5) | 9.5 (5.9, 14.5) |
|  Serum iron (µmol/L) | 11.9 (9.9, 15.9) | 15.3 (12.2, 19.9) |
|  sTfR (mg/L) | 5.4 (4.0, 6.7) | 5.0 (4.4, 5.6) |
|  Transferrin (g/L) | 2.7 (2.5, 3.4) | 2.7 (2.5, 2.9) |
|  Transferrin saturation (%) | 19.7 (14.3, 28.1) | 26.4 (21.2, 33.2) |
|  Retinol binding protein (µmol/L) | 1.7 (1.6, 2.0) | 2.0 (1.8, 2.2) |
|  Retinol (µmol/L) | 1.3 (1.1, 1.5) | 1.3 (1.2, 1.6) |
|  25(OH)D (ng/mL) | 20.2 (14.4, 28.1) | 20.2 (17.6, 23.9) |
|  Vitamin B12 (pmol/L) | **311.9 (267.0, 358.0) \*** | **411.3 (308.6, 612.4) \*** |
|  Folate (ng/mL) | 14.7 (9.0, 19.5) | 11.9 (7.0, 20.8) |
| *Vital signs* |  |  |
|  Temp (Cº) | 36.6 (36.0, 36.9) | 36.2 (36.0, 37.0) |
|  Pulse (bpm) | 71.5 (64.0, 78.0) | 75.0 (64.0, 81.0) |
|  Diastolic (mmHg) | 72.0 (65.0, 79.0) | 70.0 (60.0, 77.0) |
|  Systolic (mmHg) | 117.0 (109.0, 126.0) | 115.5 (110.0, 125.0) |
|  Respiration (brpm) | 18.0 (18.0, 18.0) | * 1. (16.0, 18.0)
 |

1. Median (quartile 1, quartile 3) or % presented; bold and \* indicates significance at α < 0.05 using either χ2 or Kruskall-Wallis to compare infected and uninflected subjects for categorical and continuous data, respectively. CRP: C-reactive protein; AGP: alpha-1-acid glycoprotein; sTfR: soluble transferrin receptor; TSAT: transferrin saturation; RBP: retinol binding protein; bpm: beats per minute; brpm: breaths per minute.

**Supplemental Table 2. β (95% CI) estimates of associations between inflammatory markers and nutritional biomarkers, accounting for measurements at all times and the lagged effects of inflammation, expanded from Table 31**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Y*t* | CRP*t* | CRP*t-2* | CRP*t-4* | AGP*t* | AGP*t-1* | AGP*t-2* | AGP*t-3* | Y­*t-1* |
| Ferritin | **0.11****(0.06, 0.15)** | **-0.07** **(-0.11, -0.03)** | --- | 0.02 (-0.02, 0.06) | --- | --- | --- | **0.91** **(0.86, 0.95)** |
| Hepcidin | 0.09 (-0.13, 0.30) | 0.05 (-0.04, 0.13) | 0.06 (-0.03, 0.15) | 0.06 (-0.09, 0.21) | --- | --- | --- | **0.54** **(0.43, 0.64)** |
| Serum iron | **-0.10** **(-0.19, -0.01)** | **0.09****(0.05, 0.14)** | **0.09** **(0.04, 0.14)** | --- | --- | --- | **-0.08** **(-0.13, -0.02)** | **0.24** **(0.12, 0.35)** |
| sTfR | **-0.06** **(-0.08, -0.03)** | --- | --- | **0.10** **(0.08, 0.13)** | **-0.05** **(-0.07, -0.03)** | --- | --- | **0.15** **(0.05, 0.25)** |
| Transferrin | -0.001 (-0.02, 0.02) | 0.003 (-0.01, 0.01) | -0.001 (-0.01, 0.01) | --- | -0.01 (-0.02, 0.002) | --- | --- | **0.89** **(0.83, 0.95)** |
| TSAT | -0.08 (-0.17, 0.02) | **0.11** **(0.06, 0.15)** | **0.09** **(0.04, 0.15)** | --- | --- | --- | **-0.08** **(-0.14, -0.02)** | **0.23** **(0.11, 0.34)** |
| RBP | **-0.07** **(-0.09, -0.05)** | --- | --- | **0.04** **(0.02, 0.06)** | --- | -0.01 (-0.03, 0.004) | --- | **0.29** **(0.19, 0.39)** |
| Retinol | **-0.05** **(-0.07, -0.04)** | -0.01 (-0.03, 0.01) | --- | --- | -0.02 (-0.04, 0.002) | --- | --- | **0.26** **(0.16, 0.36)** |
| 25(OH)D | --- | --- | --- | 0.03 (0.00, 0.05) | -0.02 (-0.05, 0.001) | **0.03****(0.004, 0.05)** | **-0.03** **(-0.05, -0.01)** | **0.18** **(0.07, 0.30)** |
|  Vitamin B12 | **-0.02** **(-0.04, -0.003)** | --- | --- | **0.03** **(0.01, 0.05)** | --- | --- | --- | **0.84** **(0.79, 0.89)** |
| Folate | 0.00 (-0.04, 0.04) | --- | --- | -0.02 (-0.07, 0.03) | --- | --- | --- | **0.48****(0.40, 0.57)** |

1. Modeling *ln(Yt) = α + θ + CRPt + CRPt-1 + CRPt-2 + CRPt-3 + CRPt-4 + AGPt + AGPt-1 + AGPt-2 + AGPt-3 + AGPt-4 + ln(Yt-1) + ε ;* where *Yt* is the nutritional biomarker concentration at measurement time *t*, *α* is the fixed intercept, *θ* is the subject random effect intercept as N(τ 2 = 0), and ε is the residual model error as N(σ2 = 0). Inflammation biomarkers CRP and AGP included at time *t* as CRP*t* and AGP*t*as well as lagged terms up to *t*-4.Standardized β (95% CI) for all terms that were included in final model; ‘---‘ indicates term was not included in final model; adjusted for subject and temporal effects using mixed effects; CRP: C-reactive protein; AGP: alpha-1-acid glycoprotein; sTfR: soluble transferrin receptor; TSAT: transferrin saturation; RBP: retinol binding protein; CRPt-1, CRPt-2, and AGPt-4 were not included in any final models and those columns were removed; bold indicates significance at α < 0.05; n=45 subjects at 10 time points