**Associations of fat and fat-free mass at birth and 0-5 years accretion with cognitive function at later childhood: The Ethiopian iABC birth cohort**

**Rahma Ali et al.**

**Supplementary Tables**

**Supplementary Table 1; Comparison between those included in the 10-year analysis and lost to follow-ups**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable**  | **Category** | **Lost to follow-up1 *n*=253** | **Followed-up 2 *n*=318** | **P value 3** |
|  |  | **n (%)** | **Mean**  | **SD** | **n (%)** | **Mean**  | **SD** |  |
| **Maternal characteristics at birth** |
| Maternal age (years) |  |  | 23.66  | 0.3 |  | 24.68  | 0.3 | 0.01 |
| BMI  |  |  | 12.5  | 0.1 |  | 12.6  | 0.01 | 0.53 |
| Height (cm) |  |  | 157.3  | 0.4 |  | 157.8  | 0.3 | 0.34 |
| Wealth index  | Poorest | 55 (24.0) |  |  | 48 (15.3) |  |  | 0.05 |
| Poor | 49 (21.4) |  |  | 55 (17.5) |  |  |
| Middle | 31 (13.5) |  |  | 81 (25.8) |  |  |
| Rich | 43 (18.8) |  |  | 71 (22.6) |  |  |
| Richest | 51 (22.3) |  |  | 59 (18.8) |  |  |
| Educational status  | No education | 20 (0.1) |  |  | 18 (0.1) |  |  | 0.61 |
| Primary  | 145 (61.7) |  |  | 194 (61.2) |  |  |
| Secondary  | 41 (17.5) |  |  | 60 (18.9) |  |  |
| Higher and above  | 29 (12.3) |  |  | 45 (14.2) |  |  |
| **Child characteristics at birth** |
| Sex | Male  | 114 (48.5) |  |  | 166 (52.4) |  |  | 0.80 |
| Female | 121 (51.5) |  |  | 151 (47.6) |  |  |
| Length (cm) |  |  | 48.9  | 0.1 |  | 49.2  | 0.1 | 0.07 |
| Gestational age (weeks) |  |  | 39.1  | 0.1 |  | 39.0  | 0.1 | 0.43 |
| Fat Mass (kg) |  |  | 0.2  | 0.01 |  | 0.2  | 0.01 | 0.49 |
| Fat free mass (kg) |  |  | 2.8  | 0.02 |  | 2.8  | 0.2 | 0.14 |
| Birth weight (kg) |  |  | 3.0  | 0.03 |  | 3.05  | 0.02 | 0.15 |
| Birth order  | First born | 140 (61.1) |  |  | 151 (47.5) |  |  | 0.01 |
| Second born | 46 (20.1) |  |  | 86 (27.0) |  |  |
| Third born | 43 (18.8) |  |  | 78 (24.5) |  |  |
| 1 Those who did not have PPVT data at 10 years2 Those who have PPVT data at 10 years 3 independent T test |

**Supplementary table 2; Association between fat and fat free mass at birth with PPVT test at 10 years of age**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Model I** | **Model II** | **Model III** |
| **β** **(95% CI)** | **P value** | **β** **(95% CI)** | **P value** | **β (95% CI)** | **P value** |
| Fat mass | -0.01 (-0.11, 0.08) | 0.77 | -0.01 (-0.11, 0.09) | 0.85 | 0.01 (-0.09, 0.11) | 0.91 |
| Fat-free mass | 0.09 (-0.004, 0.19) | 0.06 | 0.14 (0.01, 0.28) | 0.04  | 0.14 (0.01, 0.28) | 0.04  |

Model 1 was adjusted for age, sex and place of test. Model 2 was further adjusted for head circumference at birth, birth order, gestational age, HAZ at 10 years and academic grade at 10 years. Model 3 was further adjusted for maternal educational status, maternal age at child birth and wealth index.

**Supplementary table 3; Fat mass and fat-free mass accretion from 0-5 years and PPVT test at 10 years of age**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Model I** | **Model II** | **Model III** |
| **β (95% CI)** | **P .value** | **β (95% CI)** | **P .value** | **β (95% CI)** | **P value** |
| **Fat free-mass** |
| 0-3 months | 0.34 (0.01, 0.67) | 0.05 | 0.49 (0.07, 0.91) | 0.02 | 0.50 (0.08, 0.93) | 0.02 |
| 3-6 months  | -0.26 (-0.62, 0.10) | 0.15 | -0.43 (-0.84, -0.03) | 0.04 | -0.48 (-0.90, -0.07) | 0.02 |
| 6 months-4 years | 0.09 (-0.05, 0.24) | 0.20 | 0.05(-0.11, 0.21) | 0.55 | 0.06 (-0.10, 0.23) | 0.45 |
| 4-5 years | 0.03 (-0.14, 0.21) | 0.71 | -0.03 (-0.22, 0.15) | 0.75 | -0.03 (-0.21, 0.15) | 0.75 |
| **Fat mass** |
| 0-3 months | -0.001 (-0.19, 0.19) | 0.99 | -0.03 (-0.23, 0.17) | 0.75 | -0.02 (-0.23, 0.18) | 0.82 |
| 3-6 months  | 0.06 (-0.18, 0.29) | 0.63 | 0.02 (-0.22, 0.26) | 0.85 | -0.04 (-0.30, 0.21) | 0.73 |
| 6 months-4 years | -0.03 (-0.17, 0.11) | 0.69 | -0.08 (-0.23, 0.07) | 0.29 | -0.08 (-0.24, 0.08) | 0.28 |
| 4-5 years | -0.02 (-0.20, 0.17) | 0.85 | -0.06 (-0.25, 0.13) | 0.55 | -0.09 (-0.28, 0.11) | 0.39 |

Model 1 was adjusted for age, sex and place of test. Model 2 was further adjusted for head circumference at birth, birth order, gestational age, HAZ at 10 years and academic grade at 10 years. Model 3 was further adjusted for maternal educational status, maternal age at child birth and wealth index.

**Supplementary table 4; Fat mass and fat-free mass accretion from 0-5 years and PPVT test at 10 years of age using observed data (sensitivity analysis)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Model I** | **Model II** | **Model III** |
| **β (95% CI)** | **P .value** | **β (95% CI)** | **P .value** | **β (95% CI)** | **P value** |
| **Fat free mass** |
| 0-3 months | 0.25 (-0.18, 0.67) | 0.26 | 0.21 (-0.22, 0.64) | 0.33 | 0.12 (-0.33, 0.58) | 0.59 |
| 3-6 months  | -0.10 (-0.41, 0.21) | 0.51 | -0.16 (-0.47, 0.15) | 0.31 | -0.14(-0.47, 0.19) | 0.41 |
| 6 months-4 years | 0.07 (-0.06, 0.20) | 0.30 | 0.02 (-0.13, 0.17) | 0.84 | 0.04 (-0.11, 0.20) | 0.58 |
| 4-5 years | 0.08 (-0.07, 0.23) | 0.29 | 0.03 (-0.13, 0.19) | 0.68 | 0.07 (-0.09, 0.24) | 0.38 |
| **Fat Mass** |
| 0-3 months | -0.21 (-0.56, 0.15) | 0.25 | -0.22 (-0.57, 0.13) | 0.21 | -0.27 (-0.64, 0.09) | 0.14 |
| 3-6 months  | 0.08 (-0.18, 0.34) | 0.53 | 0.03 (-0.23, 0.29) | 0.81 | -0.02 (-0.29, 0.26) | 0.89 |
| 6 months-4 years | -0.02 (-0.12, 0.09) | 0.73 | -0.04 (-0.14, 0.07) | 0.47 | -0.05 (-0.16, 0.06) | 0.38 |
| 4-5 years | -0.10 (-0.26, 0.07) | 0.24 | -0.11 (-0.28, 0.06) | 0.20 | -0.16 (-0.35, 0.02) | 0.08 |

Model 1 was adjusted for age, sex and place of test. Model 2 was further adjusted for head circumference at birth, birth order, gestational age, HAZ at 10 years and academic grade at 10 years. Model 3 was further adjusted for maternal educational status, maternal age at child birth and wealth index.

**Supplementary table 5; Fat mass and fat-free mass accretion from 0-5 years and PPVT test at 10 years of age (sensitivity analysis after adjusting school type in model 2 and 3)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Model I** | **Model II** | **Model III** |
| **β (95% CI)** | **P value** | **β (95% CI)** | **P value** | **β (95% CI)** | **P value** |
| **At birth** |
| Fat mass  | -0.01 (-0.11, 0.08) | 0.77 | -0.06 (-0.16, 0.05) | 0.27 | -0.04 (-0.14, 0.06) | 0.45 |
| Fat-free mass  | 0.09 (-0.004, 0.19) | 0.06 | 0.17 (0.03, 0.31) | 0.02 | 0.18 (0.04, 0.32) | 0.01 |
| **Fat-free mass accretion** |
| 0-3 months | 0.34 (0.01, 0.67) | 0.05 | 0.48 (-0.17, 0.83) | 0.10 | 0.46 (0.09, 0.10) | 0.04 |
| 3-6 months  | -0.26 (-0.62, 0.10) | 0.15 | -0.45 (-0.43, 0.70) | 0.24 | -0.38 (-0.95, -0.08) | 0.03 |
| 6 months-4 years | 0.09 (-0.05, 0.24) | 0.20 | 0.17 (-0.02, 0.35) | 0.08 | 0.16 (-0.02, 0.35) | 0.09 |
| 4-5 years | 0.03 (-0.14, 0.21) | 0.71 | -0.18 (0.44, 0.09) | 0.19 | -0.15 (-0.42, 0.11) | 0.26 |
| **Fat mass accretion** |
| 0-3 months | -0.001 (-0.19, 0.19) | 0.99 | -0.03 (-0.47, 0.42) | 0.89 | -0.13 (-0.57, 0.31) | 0.56 |
| 3-6 months  | 0.06 (-0.18, 0.29) | 0.63 | 0.11 (-0.34, 0.56) | 0.63 | 0.14 (-0.31, 0.60) | 0.53 |
| 6 months-4 years | -0.03 (-0.17, 0.11) | 0.69 | -0.06 (-0.16, 0.05) | 0.29 | -0.06 (-0.17, 0.04) | 0.21 |
| 4-5 years | -0.02 (-0.20, 0.17) | 0.85 | -0.05 (-0.19, 0.10) | 0.54 | -0.08 (-0.23, 0.07) | 0.31 |

Model 1 was adjusted for age, sex and place of test. Model 2 was further adjusted for head circumference at birth, birth order, gestational age, HAZ at 10 years, academic grade at 10 years and school type. Model 3 was further adjusted for maternal educational status, maternal age at child birth and wealth index.

**Supplementary table 6: Fat mass and fat-free mass accretion from 0-5 years and PPVT test at 10 years of age (sensitivity analysis after adjusting breast feeding status at 6 months in model 3)**

|  |  |
| --- | --- |
|  | **Model I** |
| **β (95% CI)** | **P value** |
| **At birth** |
| Fat-free mass | 0.10 (-0.02, 0.19) | 0.13 |
| Fat mass | -0.03 (-0.14, 0.08) | 0.61 |
| **Fat free-mass** |
| 0-3 months | 0.49 (-0.04, 0.98) | 0.06 |
| 3-6 months  | -0.57 (-2.01, 0.08) | 0.07 |
| 6 months-4 years | 0.10 (-0.12, 0.33) | 0.37 |
| 4-5 years | -0.02 (-0.44, 0.41) | 0.94 |
| **Fat mass** |
| 0-3 months | -0.11 (-0.33, 0.11) | 0.34 |
| 3-6 months  | -0.08 (-0.22, 0.37) | 0.61 |
| 6 months-4 years | -0.12 (-0.29, 0.05) | 0.15 |
| 4-5 years | -0.15 (-0.37, 0.08) | 0.21 |

Model was adjusted for age, sex, place of test, head circumference at birth, birth order, gestational age, HAZ at 10 years, academic grade at 10 years, maternal educational status, maternal age at child birth, wealth index and breast-feeding status at 4.5-6 months of child’s age.